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RESEARCH ARTICLE

Short- and Long- Run Relationships among Remittance, GDP, Inflation and Interest Rates in Nepal

Asmit Raj Pandey , Deelip Raj Pandey , Rameshwar Acharya
Tribhuvan University, Public Youth Campus, Nepal

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Corresponding Author : *Asmit Raj Pandey,* **Email:** asmit676@gmail.com
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Abstract

This study examined the long- and short-term relationships between remittance, Gross Domestic Product (GDP), inflation and interest rates in Nepal. This study used time-series data from 2003 to 2024 from the world bank and Nepal Rastra Bank (NRB). The study applied econometric techniques including the Phillips-Perron unit root test, Johansen cointegration test, and Vector Error Correction Model (VECM) to analyse the dynamics among the variables. The Johansen cointegration test indicated three long-run cointegration relationships among the variables. The VECM shows that the GDP, inflation and interest rates in the long run adjust significantly to restore equilibrium when deviations occur. This might suggest a contractionary process of the economy where policies aimed at controlling inflation or excess money supply might restrain the GDP. Meanwhile, remittances tend to increase in response to economic downturns, acting as a buffer for the economy. Short-run analysis showed that past values of GDP, inflation and interest rates strongly influence their current behaviour. This might suggest structural rigidity or gradual policy transmission. Meanwhile, remittance inflow reacts positively to interest rate and negatively to inflation. This means maintaining a stable interest rate and low inflation can ensure sustained remittance flow. The study concludes that maintaining stable interest rates and low inflation ensures sustainable remittance inflows and overall macroeconomic stability in Nepal. It is recommended that policymakers channel remittance into productive sectors to enhance economic growth while minimising inflationary pressures.

Keywords: cointegration, gross domestic product, inflation, interest, remittance

Introduction

Remittance has become a major source of income for many developing countries, including Nepal. It contributes significantly to Nepal's economy by supporting various sectors and plays a crucial role in the nation's development (Aryal, 2022). Remittance income has contributed to the economic development of the nation (Acharya, 2017). Along with remittance inflow, Nepalese economy is also influenced by monetary policy inflation. A clear understanding of how these factors interact is crucial for evidence-based economic policies. Such understanding can guide policymakers in leveraging remittances effectively to bolster economic stability and growth while addressing inflationary pressures in the economy.

Findings from Kang et al. (2017) showed that the hypothesis that interest rates cause economic growth was largely rejected. They also found that manipulating interest rates through monetary policy to stimulate growth is fundamentally flawed. However, Albu (2006) found that interest rate, investment and economic growth tend to follow patterns observed in standard market economy literature. This indicates that traditional monetary policies may not produce the desired outcomes in all contexts.

Interest rate is crucial for managing inflation and stabilising the economy in Nepal, particularly due to the significant impact of remittances on macroeconomic indicators (Sapkota & Joshi, 2024). Effective monetary policies through interest rate can help manage the inflationary pressure while maximising the benefits of remittance inflows. Nepal Rastra Bank (NRB) sets bank rates through monetary policy, which were later replaced by policy rates, as an indicator of monetary policy stance (Bank, 2004). This means the policy rate shows whether monetary policy is tight or loose.

The Inflation rate in Nepal is influenced by various factors, which can affect price levels both positively and negatively (Dahal et al., 2019; Sapkota & Joshi, 2024). Monetary policy and interest rates set by NRB primarily aim to control the inflation and promote economic growth. However, the relationship between these factors is complex. Therefore, policy formulation should consider Nepal's overall economic conditions.

Nepal has become increasingly dependent on remittance for its national income and foreign exchange reserves. While interest rate and inflation are critical for managing macroeconomic stability. The dynamics between inflation, interest rate, remittance and economic growth remain poorly understood. Existing literature often treats these factors in isolation, providing limited insight. This gap creates uncertainty and deters effective decision-making. Addressing this gap is vital for formulating policies. It can also optimise remittance utilisation and reduce inflationary effects on the economy. Thus, this research intends to examine the long and short-term relationships between remittance, Gross Domestic Product (GDP), bank rate, and inflation in Nepal.

Literature Review

The relationship between interest rates, remittances, inflation, and GDP is intricate because changes in one factor affect the others. Inflation and GDP are also interrelated, with inflation having mixed effects on economic growth. The following sections examine these relationships, supported by evidence from research papers.

Impact of Interest Rate on the GDP of Nepal

Interest rates play pivotal role in influencing economic activity and overall GDP in an economy. Keynes (1936) argued that lower interest rates reduce borrowing costs. This increases aggregate demand, thereby increasing GDP. A recent study by Budhathoki et al. (2024) found similar findings reporting that the lending rate has a statistically significant positive impact on economic growth. This suggests that appropriate interest rate levels can stimulate economic activity. Similarly, a study by Nepal (2023) reported that both broad money supply and interest rates significantly affect GDP growth. These findings indicate that interest rate is a critical tool for economic development in Nepal.

Remittance and Inflation in Nepal

Remittance inflow plays a significant role in influencing price levels and overall economic activity in Nepal. Joshi (2022) found that remittance inflows contributed to inflationary pressure in the country. Similarly, Sapkota and Joshi (2024) explained that an increase in remittance raises the money supply, which increases the demand for goods and services and ultimately drives up prices. Therefore, directing remittances into productive investments could mitigate inflation (Koirala & Jeong, 2015). These indicate that while remittance supports the economy, proper management is necessary to control inflation.

Inflation and GDP in Nepal

Inflation has a complex relationship with GDP in Nepal. Ghimire et al. (2020) show that inflation does not have a significant impact on the economic growth of Nepal. A recent study from Budhathoki et al. (2024) reported positive relationship between the consumer price index (CPI) and GDP. These indicate that the relationship between inflation and GDP is not straightforward and may depend on the level and stability of inflation.

Remittance and GDP of Nepal

Remittance plays a crucial role in influencing economic growth and development in Nepal. It contributes to economic development and poverty reduction (Acharya, 2024). Pant et al. (2024) found that an increase in total remittance leads to simultaneous growth in both imports and exports, which helps reduce poverty and enhance GDP. However, Koirala and Jeong (2015) pointed out that although remittance is a significant source of foreign income, the majority of remittance income is utilised for daily consumption and non-productive sectors. This is more common among low-income households. These accounts suggest that while remittance supports GDP growth, its developmental impact could be limited unless redirected toward productive investment channels.

Interest Rates and Inflation in Nepal

Interest rate policy plays an important role in influencing inflation and overall economic stability in Nepal. Ali (2011) concluded that interest rate policy can be effective in stabilising the economy and controlling inflation. However, its effectiveness is influenced by supply-side effects and near rational expectations. It emphasises the importance of interest rate policies based on their ability to control inflation while minimising overall welfare loss. Khanal & Paudel (2024) demonstrated that inflation in Nepal is also influenced by external factors such as price movements in India, highlighting the interconnectedness of regional economies. These findings suggest that while interest rate policy is an important tool for controlling inflation, external influences should also be considered in policy formulation.

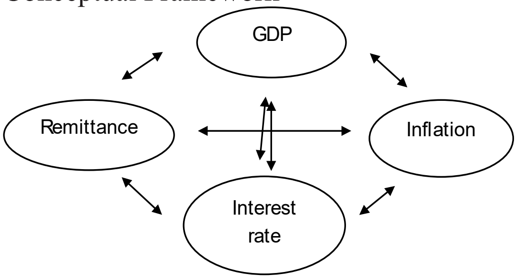
To capture both the long and short-term interactions among remittance, interest rates, inflation, and economic growth and based on the study objectives, the following hypotheses are formulated to examine both the long-run and short-run relationships among the key macroeconomic variables in Nepal:

H1: There exists a long-run equilibrium relationship among remittance, interest rates, inflation, and GDP, such that deviations from equilibrium are corrected over time.

H2**:** Short- and long-term deviations from equilibrium among remittance, interest rates, inflation, and GDP are corrected over time, influencing the dynamic adjustment process among the variables.

Figure 1

Conceptual Framework



Note: Researcher's construct from evaluating various articles and tutorials

Research Methodology

Study Area and Data

This study examined the macroeconomic relationship among GDP, remittance, inflation and interest rates in Nepal. It used secondary time-series data collected from reliable sources. Data on GDP, remittance, and inflation were obtained from the world bank's world development indicators, while interest rate data were collected from official website of NRB and monetary policy published by NRB. The study period covered 2003 to 2024, as the policy rate, which was the bank rate from 2003 to 2015, is available from 2003 onwards. The NRB's monetary policy stance was considered to be the bank rate from 2003 to 2016. Since 2016, the policy rate has been considered as the monetary policy indicator, so the policy rate was used for analysis for the post-2016.

Research Design

This study adopted a quantitative research design using time-series econometric analysis. To ensure the validity of the analysis, the Philip-Perron unit root test was first applied to check the stationarity of the data. After confirming the order of the integration Johansen cointegration test was applied to determine whether a long-run relationship exists among the variables. The vector error correction model (VECM) was then applied to analyse both short-run and long-run dynamics.

Sample

The sample consisted of annual time-series observation of GDP, remittance, inflation, and interest rates for Nepal covering the period 2003-2024.

Data Collection Method

The study used secondary data collected from reliable and publicly available sources. Data on GDP, remittance and inflation were obtained from the world development indicators database of world bank. Data on the interest rates were taken from official website of NRB, including published monetary policy reports.

Data Analysis Tools and Techniques

All econometric analyses including the stationarity test (Philips-Perron test), cointegration analysis and vector correction model, were performed using R-studio software.

The data used in this study were obtained from official and publicly available sources. Since the study did not involve human subjects or confidential information, ethical approval was not required.

Phillis-Perron Unit Root Test

To begin the analysis, it is necessary to test the stationary of the variables. The Phillips-Perron (PP) test is one of the widely used methods for checking unit roots. This test assumes that the time-series variables may be non-stationary in their level form. It further assumes that stationarity can be achieved after first differencing the data. This ensures that the variables are appropriate for econometric analysis and helps avoid spurious regression results. Developed by Phillips & Perron (1988), the unit root test has become popular in the analysis of financial time series. The PP test regression equation is:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \varepsilon_t$$

Here Δ is the first difference operator, ε_t is the random error term, Y = variable, T= linear trend, α_0= constant. The null hypothesis states that α = 0, and the alternative hypothesis states that α < 0. Once the value for the test statistic is computed, we will compare it with the critical value of the Phillips-Perron test. If the test statistic exceeds (in absolute value) the critical value at 5% level of significance, then the null hypothesis of α = 0 is rejected, indicating that the series is stationary (i.e., no unit root is present).

Johansen Test

To assess the long-run equilibrium relationships among remittances, interest rates, inflation, and GDP, the study used the Johansen cointegration test. Johansen (1991) proposed a method to estimate and test for cointegration vectors for non-stationary variables. The test assumes that the variables are non-stationary but integrated of the same order, and that a linear long-run relationship exists among them. Under these conditions, the test determines whether the variables maintain long-run relationship despite short-term fluctuations. The VAR representation is:

$$\Delta Y_t = \Pi\, Y_{t-1} \sum_{i=1}^{k-1} \Gamma_i\, \Delta Y_{t-1} + \varepsilon_t$$

$Y_t = GDP_t$, $In(Remittance_t)$, Inflation$_t$, $Interest\ Rate_t$

Δ = the first difference operator

Π = information about the long-run relationship among the variables,

Γ_i = captures short-term dynamics

ε_t = error term

The results are evaluated using trace and maximum eigenvalue statistics. These are compared with critical value at the 5% level to identify the existence and number of cointegration relationships.

Vector Error Correction Model

After the confirmation of cointegration, this study analysed the short-term dynamics and adjustment mechanisms using a vector error correction model (VECM) (Lütkepohl, 2005). The model assumes that all variables included in the system must be non-stationary in their levels but stationary after first-differencing. There must be at least one cointegration relationship among the variables. The relationships among the variables are assumed to be linear. The error terms must be white noise processes and should not exhibit any serial correlation. It also examines the predictive effects of short-term changes in the variables. The model is specified as follows:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{p-1} \Gamma_i\, \Delta Y_{t-i} + \ (\beta' Y_{t-i}) + \varepsilon_t$$

Y_{t-i} = vector of endogenous variables (GDP, inflation, interest rate, remittance)

$\sum_{i=1}^{p-1} \Gamma_i\ \Delta Y_{t-i}$ = Short run dynamics - shows how past change in variable affects current change

α_0= A constant vector capturing intercepts or deterministic trends.

$\alpha(\beta' Y_{t-i})$ = The error correction term (ECT) - captures the long-run relationship among variables.

ε_t= white-noise error term

Results and Discussion

The Philip-Pherron test was conducted to test the stationarity of the variables. The results in table 1 indicate that none of the variables are stationary at the level. Among the variables, remittance was converted into natural logarithms.

Table 1

Results of the PP Unit Root Test.

Variable	PP-Statistic Level	P-Value (Level)	PP-Statistics (1st diff)	P-value (1st Diff)	Order of Integration
GDP	-5.7596	0.7593	-19.625	0.02844	I(1)
In(Remittance)	-6.3015	0.723	-18.868	0.0379	I(1)
Inflation	-11.395	0.3817	-22.914	0.01	I(1)
Interest rate	-10.991	0.4088	-21.343	0.016	I(1)

Note. All results were computed using RStudio

At the level form, all variables have high p-values. This indicates that the null hypothesis of a unit root test cannot be rejected, meaning the variables are non-stationary at levels. However, after taking the first difference, the p-values for all variables drop below 0.05, confirming their stationarity.

Since all the variables are found to be integrated of order one, I(1), the necessary condition for cointegration analysis is satisfied. Johansen cointegration test was then applied to examine if there is a long run equilibrium relationship among the variables.

Table 2

Trace Statistics Test for the Number of Cointegrating Relations

Hypothesis	Eigenvalue	Test statistics	5% Critical Value	Result
r = 0	0.734	70.57	53.12	Reject Ho, ≥ 1 cointegration
r ≤ 1	0.626	43.37	34.91	Reject Ho, ≥ 2 cointegration
r ≤ 2	0.525	23.69	19.96	Reject Ho, ≥ 3 cointegration
r ≤ 3	0.356	8.81	9.24	Do not reject Ho

Note. All results were computed using RStudio.

Table 2 shows the results of Johansen trace test. Cointegration indicates whether variables move together over time and share a stable long-run equilibrium despite short-term fluctuations. The null hypothesis states that the number of cointegration relations is at most r.

The results from table 2 indicate that for r ≤ 2, the trace statistics are higher than the critical values, so we reject the null hypothesis. However, for r ≤ 3, the trace statistic is lower than the critical value, and we cannot reject the null hypothesis. This result shows that there are three cointegration relationships among the variables supporting the H1 hypothesis. This implies that GDP, remittance, inflation and interest rates move together in the long run. The findings suggest that these variables are interdependent and share a stable long run equilibrium reflecting strong macroeconomic linkage among key indicators of the Nepalese economy.

Table 3 shows the long-run dynamics from the VECM model through error correction term (ECT). It shows how each variable adjusts in response to the long-run imbalance in the system. The ECT coefficients indicate how each variable reacts to restore the equilibrium when deviations occur. It captures the speed and direction at which each variable adjusts to restore long-run equilibrium after a short-term shock. A negative and significant coefficient indicates convergence toward equilibrium, while a positive coefficient suggests divergence.

Table 3

Long-Run Dynamics Result (VECM, Error Correction Terms ECT)

Dependent variables	Coefficient (ECT)	t-statistics	Probability	Equilibrium Adjustment
GDP	-1.4871(ECT1)	-3.543	0.0046**	GDP adjusts itself to restore the long-run equilibrium
Interest rate	-6.2708 (ECT1), -1.2032 (ECT2)	-2.565, -2.971	0.0263*, 0.0127**	Interest rate responds to long-run imbalances caused mainly by deviations in GDP (ECT1) and remittance (ECT2)
Inflation	-2.0027 (ECT3)	-4.448	0.00098***	Inflation adjusts to correct long-run disequilibrium captured in ECT3
Remittance	0.7882 (ECT2)	3.321	0.0068**	Remittance responds positively to long-run imbalances mainly caused by GDP and interest rate (ECT2)

Note. All results were computed using RStudio**.** *, **, *** indicate significance at 10%, 5%, and 1% levels, respectively; ECT1, ECT2, ECT3 represent error correction terms from cointegration equations 1,2 and 3, respectively.

The results show that GDP has negative and significantly ECT1, indicating that it adjusts to correct deviations from long-run equilibrium. Similarly, interest rates exhibit negative and significant coefficient for both ECT1 and ECT2, suggesting that they respond to imbalances arising mainly from GDP and remittance. Inflation shows a corrective response identified in the third cointegration relation (ECT3). It shows that it adjusts in coordination with other variables. Finally, remittances respond to disequilibrium captured in the second cointegration vector. It responds positively to deviations associated with GDP and interest rates, indicating it moves in the same direction as the disequilibrium rather than correcting it. This implies that remittance supports the economy during the periods of imbalance.

Table 4 shows the short-run dynamics from the VECM. It focuses on lagged differences of the variables. In this framework, the coefficient of lagged differences(Δ) captures how past short-term changes influence current movements. Significant lagged differences indicate that past values influence current changes. The results show that GDP, interest rate and inflation, are significantly influenced by their own lagged values, as evidenced by the t-statistics and p-value. This means that their past values significantly influence their current short-run dynamics. The reliance on lag 1(the previous period) for all variables confirms that the economic system reacts quickly to shocks, with adjustment and causal effects manifesting within a single time interval. This suggests that these variables possess a short memory where movements in the immediate past directly dictate the current trajectory.

Table 4
Short-Run Causality Result: Lagged Differences

Dependent variables	t-statistics	Probability	Source of Causation
GDP	-1.2342 (ΔGDP lag1)	0.0016**	Own past values (self-correction)
Interest rate	-1.1416 (Δ Interest rate lag1)	0.00027***	Own past values (self-correction)
Inflation	-1.6151 (Δ Inflation lag1)	0.0000458***	Own past values (self-correction)
Remittance	0.4001 (Δ Interest rate lag1), -0.1345 (Δ Inflation lag1)	0.0093**, 0.0323**	interest rate (+), Inflation (–)

Note. All results were computed using RStudio. *, **, *** indicate significance at 10%, 5%, and 1% levels, respectively; Δ represents the first difference; lag 1 represents the previous period.

In contrast, for remittance, its short-run changes are driven by the movement in interest rates (positive) and inflation (negative). These results highlight the short-run interdependencies among the variables and the role of past values in shaping current dynamics. These findings show that overall deviation from equilibrium is corrected over time. These findings partially support the H2 hypothesis. Most variables adjust themselves to maintain equilibrium. Ultimately, the model demonstrates that most variables adjust themselves autonomously to maintain system equilibrium.

Conclusion and Implications

This study examined the long-term and short-term relationships among remittances, GDP, inflation, and interest rates in Nepal using cointegration analysis and VECM for the period 2003-2024. The Johansen cointegration test showed three significant cointegration relationships among the variables. It indicates that these macroeconomic indicators move together in the long run despite short-term fluctuations.

From the ECT coefficient, we get the long-run dynamics between the variables. GDP has a negative and significant ECT coefficient. This means that it adjusts downward to correct deviation from the long-run equilibrium. Similarly, the interest rate also has a negative ECT, which suggests that it declines to correct the disequilibria caused by GDP and remittance. There is also a negative and significant ECT for inflation. This indicates that when prices deviate from the long-run equilibrium, inflation moves in the opposite direction to restore stability. When inflation is low, then demand rises again and increases the price level. In contrast, remittance has a positive and significant ECT, meaning it moves in the same direction as the deviation from equilibrium. Therefore, when GDP falls or interest rate deviates, remittance rises further instead of correcting the imbalance. They rise when the domestic economy or interest rates decline. This suggests that in the long run, remittance acts as a compensatory force supporting household expenditure. Remittances seem to have little effect on increasing the GDP of the country.

This behaviour might reflect the structural characteristics of Nepal's economy. The adjustment of GDP may reflect cyclic economic behaviour. The economy might be influenced by remittance, seasonal agricultural patterns, major festivals that boost consumption. As these subside, the economy naturally slows and returns to its long-term equilibrium. This cyclic trend of GDP has been shown by Emara & Ma (2019). The adjustment of interest rates maybe the result of liquidity management by NRB, where increased GDP or remittance inflow create excess liquidity, lending to policy response to stabilize demand (Mester, 2016). Inflation adjustment might occur when price rises sharply through household spending or import cost inflation falls, as purchasing power falls (Pratiwi & Prasetyia, 2012), or the monetary policy takes effect. A study by Apanisile (2021) has shown that excess remittance can hinder the effectiveness of monetary policy channels as they often bypass the formal financial system and can lead to excess liquidity

In the short run, GDP, interest rates, and inflation is dependent on their own past values. Interest rates show similar self-correction while inflation is also influenced by its own lagged values. Remittance tends to rise with higher interest rates in the short run, but it has a negative relationship with inflation.

For GDP, this might be caused by seasonal tourism, seasonal agriculture or remittance-driven consumption, which tend to stabilize over time. The self-correction of interest rates might be due to NRB's liquidity management policy intervention, which helps them return towards equilibrium. Inflation dynamics can be linked to Nepal's import-based economy, where rising import costs lead to temporary price increase. However, reduced demand and monetary policy response might help restore price stability. Remittance increases with higher interest rates as higher savings returns encourage remittance inflows. Remittance has negative relation with inflation as higher inflation reduces the value of remittance and discourages inflow in the short run.

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Data are safely stored. They will be made available upon request.

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The authors declare that there is no conflict of interest in relation to this manuscript.

Ethical Compliance

"Not applicable."

Consent for Publication

"Not applicable"

Plagiarism and AI Use

The manuscript is free from plagiarism and improper use of AI-generated content. Any permitted use of AI tools was limited to language support and has not replaced original scholarly contribution.

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Appendix A

Table A1

Johansen Cointegration test (Trace Statistics)

Hypothesized no. of cointegration	Trace Statistics	10%	5%	1%
r <= 3	8.81	7.52	9.24	12.97
r<= 2	23.69	17.85	19.96	24.60
r <= 1	43.37	32.00	34.91	41.07
r = 0	70.57	49.65	53.12	60.16

Note. The trace statistics indicates the presence of cointegrating vectors at the .05 level.

Appendix B: Model Matrices

This appendix shows how the variables interact and how quickly they adjust to shocks.

Table B1

Normalized Cointegrating Coefficients (Eigenvectors)

Variable	Remittance	GDP	Inflation	Interest rate	Constant
Remittance)	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
GDP	0.12806749	-0.87871258	1.1809729	-0.31965041	-5.3725378
Inflation	0.08169495	-0.08905933	-0.2111163	-0.02303056	-0.1100373
Interest rate	-0.32948523	0.05989368	0.1576333	0.33802234	0.6578562
constant	1.33464893	18.34350926	24.9912181	2.39397786	121.8388437

Table B2

Loading Matrix (Weights)

Variable	Remittance	GDP	Inflation	Interest rate	Constant
Remittance	-0.335709394	0.2359353	0.004707438	-0.06591303	1.261786e-13

GDP	-0.006484811	0.1360029	-0.03647305	-0.00822024	-3.522926e-14
Inflation	0.655900440	3.1594011	2.98109531	-2.07981995	3.644371e-12
Interest rate	2.046958142	-0.5047616	-0.59269835	-1.15082507	6.524030e-13

Appendix C: VECM Regression Results

Table C1

Summary of Residuals for VECM Models

Min	1Q	Median	3Q	max
-0.04902	-0.00737	-0.00344	0.01321	0.03810

Note. Residuals represent the difference between the observed value and the values predicted by the VECM model.

Table C2

VECM Regression Estimates for Response Variable: GDP

Coefficients:	Estimate	Std. error	T value	Pr(>|t|)
Ect1	-1.4870688	0.4197670	-3.543	0.00461 **
Ect2	-0.0003362	0.0695408	-0.005	0.99623
Ect3	-0.0337410	0.0290527	-1.161	0.27007
Constant	0.0651012	0.0196415	3.314	0.00690 **
GDP	1.2342263	0.2965350	-4.162	0.00690 **
Interest rate	-0.0149705	0.0372892	-0.401	0.69576
Inflation	-0.0174540	0.0160956	-1.084	0.30138
Remittance	-0.0380455	0.0796420	-0.478	0.64221

Note. R-squared = .667; Adjusted R-squared = .425; F(8,11) = 2.752

** p < .01

Table C3

Summary of Residuals for Response Variable: Interest Rate

Min	1Q	Median	3Q	Max
-0.219047	-0.057822	-0.003016	0.068028	0.239053

Table C3

VECM Regression Estimates for Response Variable: Interest rate

Coefficients:	Estimate	Std. error	T value	Pr(>|t|)
Ect1	-6.27079	2.44433	-2.565	0.026263 *
Ect2	-1.20318	0.40494	-2.971	0.012717 *
Ect3	0.01560	0.16918	0.092	0.928182
Constant	0.26408	0.11437	2.309	0.041379 *
GDP	-1.65874	1.72674	-0.961	0.357383
Interest rate	-1.14158	0.21714	-5.257	0.000269 ***
Inflation	0.03066	0.09373	0.327	0.749675

Remittance	-0.26964	0.46376	0.581	0.572681

Note. R-squared = .806; Adjusted R-squared = .666; F(8,11) = 5.726,
*p< .05; ***p <.001

Table C4
Summary of Residuals for Response Variable: Inflation

Min	1Q	Median	3Q	Max
-0.69345	-0.22007	0.03695	0.27177	0.55012

Table C5
VECM regression Estimates for Response Variable: Inflation

Coefficients:	Estimate	Std. error	T value	Pr(>|t|)
Ect1	3.3679	6.5057	0.518	0.614932
Ect2	0.4510	1.0778	0.418	0.683679
Ect3	-2.0027	0.4503	-4.448	0.000982 ***
Constant	-0.2238	0.3044	-0.735	0.477634
GDP	3.4469	4.5958	0.750	0.468993
Interest rate	1.101	0.5779	1.905	0.083178
Inflation	-1.6151	0.2495	-6.475	4.58e-05 ***
Remittance	1.8533	1.2343	1.501	0.161379

Note. R-square = .866; Adjusted R-squared = .786; F(8,11) = 8.847
***p <.001

Table C6
Summary of Residuals for Response Variable: Remittance

Min	1Q	Median	3Q	Max
-0.123658	-0.037015	0.003489	0.027867	0.147893

Table C7
VECM regression Estimates for Response Variable: Remittance

Coefficients:	Estimate	Std. error	T value	Pr(>|t|)
Ect1	-0.89476	1.43263	-0.625	0.54500
Ect2	0.78822	0.23734	3.321	0.00682 **
Ect3	-0.14883	0.09915	-1.501	0.16151
Constant	0.04612	0.06703	0.688	0.50571
GDP	-0.23611	1.01205	-0.233	0.81981
Interest rate	0.40007	0.12726	3.144	0.00935 **
Inflation	-0.13453	0.05493	-2.449	0.03230 *
Remittance	-0.44582	0.27181	-1.640	0.12922

Note. R-square = .691; Adjusted R-squared = .466; F(8,11) = 3.072
*p < .05, **p <.01