

Does Remittance Inflow Granger.....

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Does Remittance Inflow Granger-Cause Consumption in Nepal? A Time-Series Analysis

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Abstract

This paper examines whether remittance inflows Granger-cause household consumption in Nepal using annual time-series data from 1993 to 2023. The analysis is conducted within a multivariate framework that includes real GDP, the consumer price index and broad money as a share of GDP as control variables, alongside remittances and consumption. After all five series are confirmed to be integrated of order one, the Johansen cointegration test identifies one cointegrating vector. A vector error correction model is estimated, and Granger causality is tested within this framework. The long-run results show that remittances and GDP both raise household consumption, with elasticities of 0.31 and 0.58, respectively. Unidirectional Granger causality runs from remittances to consumption in both the short run and the long run. The error correction term in the consumption equation is negative and statistically significant, implying that about 36 percent of any deviation from long-run equilibrium is corrected within a year. The findings hold after income, prices and financial depth are controlled for, and indicate that remittances are a structural rather than a temporary driver

of household spending in Nepal. The policy implications concern financial deepening, the channelling of remittances into productive investment, and the reduction of the exposure of households that depend heavily on income earned abroad.

Keywords: Remittances, Household consumption, Granger causality, Cointegration, Financial development, Nepal

Introduction

Over the past three decades, Nepal has become one of the most remittance-dependent economies in the world. According to the World Bank (2023), personal remittances as a share of GDP in Nepal have consistently remained between 22 and 25 percent, placing the country among the top five globally, and inflows have continued to set new records in the most recent fiscal years (Nepal Rastra Bank [NRB], 2025). Behind these aggregate figures are millions of Nepali workers in Malaysia, the Gulf states, India, South Korea and Japan who send money to families across the hills, the Terai and the Kathmandu Valley.

The household survey record shows how deeply remittances have penetrated the economy. The share of households receiving remittances rose from 23.4 percent in the first Nepal Living Standards Survey (NLSS I, 1995/96) to 31.9 percent in NLSS II (2003/04), to 55.8 percent in NLSS III (2010/11), and to more than three-quarters of all households in NLSS IV (2022/23) (Central Bureau of Statistics [CBS], 2011; National Statistics Office [NSO], 2024). NLSS III further reported that nearly 79 percent of remittance income was used for daily consumption, with only a small residual devoted to capital formation (CBS, 2011). Two implications follow for the present study. First, the remittance–consumption channel is no longer a household-level phenomenon confined to a minority of families; it is now the dominant transmission channel through which foreign earnings reach the domestic economy. Second, because each successive survey shows both wider coverage and a persistently consumption-heavy use pattern, the natural question is whether this micro-level regularity aggregates into a stable, causal macroeconomic relationship, which is precisely what a cointegration and Granger causality framework is designed to test.

Whereas the micro evidence is consistent, the macro picture is less settled, and the reasons are visible in the empirical literature itself. Cross-country studies of the aggregate effects of remittances reach conflicting conclusions: Chami et al. (2005) found that remittance flows are compensatory and negatively related to growth; Barajas et al. (2009) found no robust growth effect at all; Catrinescu et al. (2009) found positive effects only where institutions are sound; and Giuliano and Ruiz-Arranz (2009) found that the effect depends on the depth of the financial system. For Nepal specifically, the macroeconomic assessments have emphasized Dutch disease pressures and import leakages rather than a settled consumption relationship (Pant, 2011; Sapkota, 2013). Aggregate consumption has

undoubtedly grown alongside aggregate remittance receipts, but this co-movement, by itself, establishes nothing about causation.

The distinction between correlation and causation is central to the remittance–consumption example. Both series trend upward over the sample period, and both respond to common third factors, in particular aggregate income, the price level and the state of the financial system, so their co-movement could reflect nothing more than a shared response to these forces. Causation could, moreover, run in either direction: remittances may finance consumption, but altruistic migrants may also remit more when consumption at home falters, in which case consumption shocks would drive remittance flows rather than the reverse. The Granger (1969) framework addresses exactly this identification problem. The test does not establish causality in a deep philosophical sense; it asks whether past values of one variable improve the forecast of another beyond what the second variable’s own history provides. Applied within a multivariate system that controls for the common drivers, it distinguishes a genuine predictive relationship running from remittances to consumption from spurious correlation and from reverse causation, which is why a bivariate setup, of the kind used in earlier Nepali work, is insufficient: a two-variable system risks attributing to remittances what is in fact a shared response to income, prices or financial deepening (Aggarwal et al., 2011; Combes & Ebeke, 2011; Giuliano & Ruiz-Arranz, 2009).

There are two objectives of this study, which are addressed jointly in a multivariate cointegration framework. The first objective is to examine whether remittance inflows, household consumption, income, prices and financial depth share a long-run equilibrium relationship. The second is to investigate the direction of short-run and long-run Granger causality between remittances and household consumption within the resulting vector error correction model (VECM). The policy lessons that follow from the estimated pattern are drawn out in the concluding section.

The remainder of the study is organized as follows. Section 2 reviews the theoretical framework and the national and international empirical literature and identifies the gap this study fills. Section 3 describes the data and variables, specifies the econometric model, and sets out the estimation strategy. Section 4 presents the empirical results in sequence: descriptive statistics, unit root tests, lag selection and cointegration tests, the vector error correction estimates, the Granger causality tests and the diagnostic checks, with the parameter stability plots reported in Appendix A. Section 5 discusses the findings in relation to the literature, and Section 6 concludes with the policy implications and the limitations of the study.

Literature Review

Theoretical Framework

The theoretical link between remittances and consumption rests on the permanent income

hypothesis (Friedman, 1957) and the life-cycle model (Modigliani & Brumberg, 1954). If migrants and their families view remittances as transitory income, standard theory predicts a high marginal propensity to save and a relatively modest effect on consumption. If, on the other hand, remittances are anticipated and stable, they will be treated as part of permanent income, and consumption will respond nearly one-for-one. The empirical literature suggests that remittance income typically lies between these poles, more stable than transitory income but less assured than permanent income (Adams & Page, 2005). Financial development mediates the relationship in both directions: deeper financial systems allow households to smooth consumption, save remittance income or borrow against expected future inflows, while remittances themselves can promote financial deepening (Aggarwal et al., 2011; Giuliano & Ruiz-Arranz, 2009).

International Empirical Evidence

Cross-country studies generally find positive effects of remittances on consumption, poverty reduction and human capital, though the growth evidence is contested. Adams and Page (2005) showed, using data from 71 developing countries, that a 10 percent rise in remittances per capita is associated with a 3.5 percent fall in the headcount poverty ratio, and Acosta et al. (2008) confirmed sizeable poverty-reducing effects for Latin America. Combes and Ebeke (2011) found that remittances reduce consumption volatility, especially where financial systems are weak. On the growth side, the evidence is mixed: Chami et al. (2005) reported negative effects, Barajas et al. (2009) found no robust effect, and Catrinescu et al. (2009) and Giuliano and Ruiz-Arranz (2009) found effects conditional on institutions and financial development, respectively. Household-level studies sharpen the expenditure question. Adams and Cuecuecha (2010) found that Guatemalan households treat remittances partly as investment income, spending more at the margin on housing and education, whereas their later work on Ghana found remittances raising both consumption and investment expenditure (Adams & Cuecuecha, 2013). Yang (2008), exploiting exchange rate shocks during the Asian financial crisis, showed that Philippine households channel favourable remittance windfalls disproportionately into human capital and entrepreneurship rather than current consumption. In South Asia, Siddique et al. (2012) applied Granger causality methods to Bangladesh, India and Sri Lanka and reported mixed results, with the direction of causation varying across the three economies.

Evidence on Nepal

The Nepali literature spans descriptive, micro and macro strands. Gaudel (2006) provided an early descriptive account of how households use remittance money. Lokshin et al. (2010) estimated that work-related migration accounted for a substantial part of the decline in poverty between 1996 and 2004. Bansak and Chezum (2009) found that net remittances

improve the schooling of children left behind, and Acharya and Leon-Gonzalez (2014) showed that remittances relax liquidity constraints on household human capital investment. Karki Nepal (2016) confirmed positive effects on child outcomes and education expenditure using nationally representative data. At the macro level, Pant (2008, 2011) reviewed the implications of remittances for Nepal and warned of Dutch disease pressures on the tradable sector; Bhatta (2013) found in a VECM framework that remittance inflows widen the trade deficit by financing imports of consumption goods; and Sapkota (2013) concluded that remittances raise consumption and reduce poverty while contributing little to productive investment. The survey record (CBS, 2011; NSO, 2024) documents ever-wider remittance coverage with a persistently consumption-dominated use pattern.

What remains unestablished in this literature is whether the consumption effect survives at the macroeconomic level once aggregate income, prices and the financial system are properly accounted for. The Nepali macro studies are either bivariate, focused on other outcome variables such as the trade balance or growth, or descriptive. The present study fills this gap by testing the remittance–consumption relationship for cointegration and Granger causality within a five-variable system that controls for the common drivers of both series.

Methods

Data and Variables

The analysis uses annual data from 1993 to 2023, giving 31 observations. Five variables enter the system. Household final consumption expenditure (CONS) is the dependent variable of interest, and personal remittances received (REM) is the explanatory variable of interest. The three controls are real GDP (GDP), the consumer price index (CPI) and broad money as a share of GDP (FD), which proxies for financial depth. All variables are taken from the World Development Indicators (World Bank, 2023), with FD and CPI cross-checked against the Nepal Rastra Bank (2022) database. All five variables are converted to natural logarithms to permit an elasticity interpretation and are referred to below as $\ln\text{CONS}$, $\ln\text{REM}$, $\ln\text{GDP}$, $\ln\text{CPI}$ and $\ln\text{FD}$.

The selection of controls follows the consumption-function literature. Income is the canonical determinant of consumption under both the permanent income hypothesis and the life-cycle model. The price level captures the real value of nominal income flows. Financial depth matters because it shapes the extent to which households can smooth consumption, save remittance income or borrow against expected future inflows (Aggarwal et al., 2011; Giuliano & Ruiz-Arranz, 2009). The period 1993 to 2023 covers the years for which all five series are reported without gaps and spans the major structural events that have shaped the Nepali economy: the post-1990 economic liberalisation, the Maoist conflict, the constitutional transition, the 2015 earthquake and the COVID-19 episode.

Model Specification

The long-run consumption function to be estimated is specified as

$$\ln \text{CONS}_t = \beta_0 + \beta_1 \ln \text{REM}_t + \beta_2 \ln \text{GDP}_t + \beta_3 \ln \text{CPI}_t + \beta_4 \ln \text{FD}_t + \varepsilon_t, \quad (1)$$

where β_1 is the long-run elasticity of household consumption with respect to remittance inflows and is the coefficient of central interest, β_2 is the income elasticity of consumption, which is expected to be positive, β_3 captures the effect of the price level, and β_4 captures the effect of financial depth, which is expected to be positive if deeper financial systems ease household liquidity constraints. Before equation (1) can be estimated, the time-series properties of the data must be established. The order of integration of each series is determined using the Augmented Dickey–Fuller (ADF) test (Dickey & Fuller, 1979) and the Phillips–Perron (PP) test (Phillips & Perron, 1988), based on the regression

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \sum_i \delta_i \Delta y_{t-i} + \varepsilon_t, \quad (2)$$

where Δ is the difference operator, α is the intercept, t is a time trend included where the data indicate one, the lagged differences absorb residual serial correlation, and ε_t is a white noise error. The unit root null hypothesis is $\gamma = 0$ against the alternative $\gamma < 0$, and the lag length is selected by the Schwarz information criterion. The PP test applies a non-parametric correction and serves as a robustness check.

If all five variables are integrated of order one, cointegration is tested using the Johansen (1988, 1991) procedure, which begins from an unrestricted VAR(p),

$$Y_t = A_0 + \sum_{i=1}^p A_i Y_{t-i} + \varepsilon_t, \quad (3)$$

where $Y_t = (\ln \text{CONS}_t, \ln \text{REM}_t, \ln \text{GDP}_t, \ln \text{CPI}_t, \ln \text{FD}_t)'$ is the 5×1 vector of endogenous variables. Rewriting equation (3) in error correction form gives

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \mu + u_t, \quad (4)$$

where Π is the 5×5 long-run impact matrix whose rank r equals the number of cointegrating vectors, tested using the trace and maximum eigenvalue statistics. If exactly one cointegrating vector is identified, it is normalized on $\ln \text{CONS}$ to recover the long-run relation in equation (1), and the lagged residual from that relation forms the error correction term,

$$\text{ECT}_{t-1} = \ln \text{CONS}_{t-1} - \beta_0 - \beta_1 \ln \text{REM}_{t-1} - \beta_2 \ln \text{GDP}_{t-1} - \beta_3 \ln \text{CPI}_{t-1} - \beta_4 \ln \text{FD}_{t-1}. \quad (5)$$

The consumption equation of the VECM, on which the causality analysis centres, is then

$$\Delta \ln \text{CONS}_t = \alpha_1 + \lambda_1 \text{ECT}_{t-1} + \sum_i \Psi_{1i} \Delta \ln \text{CONS}_{t-i} + \sum_i \Phi_{1i} \Delta \ln \text{REM}_{t-i} + \sum_i \Phi_{2i} \Delta \ln \text{GDP}_{t-i} + \sum_i \Phi_{3i} \Delta \ln \text{CPI}_{t-i} + \sum_i \Phi_{4i} \Delta \ln \text{FD}_{t-i} + u_{1t}, \quad (6)$$

with analogous equations for the other four variables. Short-run Granger causality is examined through Wald tests on the lagged differenced terms in each equation; long-run causality is examined through the statistical significance of the error correction term. A negative and significant λ_1 in the consumption equation, combined with an insignificant error correction term in the remittance equation, indicates long-run causality running from remittances to consumption (Granger, 1969).

All estimation is carried out in EViews 12. The lag length in the VECM is selected using the Akaike, Schwarz and Hannan–Quinn information criteria, and the residuals of the estimated system are subjected to diagnostic tests for serial correlation, heteroskedasticity, normality and parameter stability, the last through CUSUM and CUSUM of squares plots.

Results

Descriptive Statistics

Table 1 summarizes the basic features of the five variables in logged form, together with the average annual growth of each variable in level form, which conveys the trend over the sample period. All series rise substantially over the three decades. Remittance inflows grew from roughly 56 million US dollars in 1993 to over 11 billion in 2023, an average growth of about 19 percent per year, by far the fastest of the five series. Household consumption and real GDP grew at roughly 8 and 7 percent per year respectively, the price level at about 5 percent, and financial depth, measured by broad money to GDP, at about 4 percent per year, reflecting the expansion of the banking sector after the financial liberalisation of the 1990s.

Table 1.

Descriptive Statistics (variables in natural logarithms)

Statistic	lnCONS	lnREM	lnGDP	lnCPI	lnFD
Mean	23.46	21.74	23.83	4.41	4.04
Median	23.51	22.04	23.85	4.40	4.06
Maximum	24.43	23.26	24.78	5.12	4.65
Minimum	22.10	17.94	22.65	3.65	3.38
Std. Dev.	0.71	1.62	0.65	0.43	0.39
Skewness	-0.21	-0.12	-0.18	-0.04	-0.16
Kurtosis	2.94	2.87	2.91	2.78	2.81
Jarque-Bera	0.31	0.18	0.24	0.11	0.19
Probability	0.857	0.913	0.886	0.946	0.910

Average annual growth (%, level form)	8.1	19.4	7.4	5.0	4.3
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Note. Average annual growth is the compound annual growth rate of each variable in level form over 1993–2023.

The standard deviation is largest for lnREM, reflecting the rapid and uneven growth of remittance inflows; the other four variables are smoother. Skewness values lie close to zero and kurtosis values near three across all series, and the Jarque-Bera statistic does not reject normality at the 5 percent level in any case.

Unit Root Tests

Table 2 reports the ADF and PP statistics for the five variables in levels and in first differences.

Table 2.
Augmented Dickey-Fuller and Phillips-Perron Unit Root Test Results

Variable	ADF (Intercept)	ADF (Intercept + Trend)	PP (Intercept)	PP (Intercept + Trend)	Order
lnCONS	-1.07	-2.04	-1.19	-1.97	I(1)
lnREM	-1.34	-2.18	-1.41	-2.05	I(1)
lnGDP	-0.92	-1.86	-1.04	-1.92	I(1)
lnCPI	-1.51	-2.32	-1.62	-2.27	I(1)
lnFD	-1.28	-2.11	-1.39	-2.18	I(1)
Δ lnCONS	-4.27***	-4.38***	-4.31***	-4.42***	—
Δ lnREM	-4.62***	-4.71***	-4.55***	-4.66***	—
Δ lnGDP	-4.18***	-4.29***	-4.22***	-4.34***	—
Δ lnCPI	-3.96***	-4.07***	-4.01***	-4.12***	—
Δ lnFD	-4.05***	-4.16***	-4.11***	-4.21***	—
5% critical value	-2.97	-3.58	-2.97	-3.58	—

Note. *** denotes rejection of the null of a unit root at the 1% significance level. Δ is the first-difference operator. Lag length for ADF chosen using the Schwarz information criterion.

In levels, none of the five series rejects the unit root null at conventional significance levels under either testing procedure. After first differencing, the ADF and PP statistics comfortably reject the null at the 1 percent level for every variable. All five variables are therefore I(1), which is the precondition for proceeding to the Johansen cointegration step.

Lag Length and Cointegration Test

Lag length selection criteria for the unrestricted VAR are reported in Table 3. The Schwarz and Hannan–Quinn criteria both indicate a lag length of one, while the Akaike criterion selects two lags. To preserve degrees of freedom in a five-variable system estimated on 31 observations, one lag is used in the VECM.

Table 3.
VAR Lag Length Selection Criteria

Lag	LogL	AIC	SC	HQ
0	-31.42	2.451	2.683	2.521
1	121.78	-5.642	-4.176*	-5.184*
2	146.92	-5.713*	-3.012	-4.873
3	152.31	-4.987	-1.052	-3.766

Note. Asterisks indicate the lag length chosen by the respective criterion.

Table 4 reports the Johansen trace and maximum eigenvalue statistics for the five-variable system. The model includes an intercept in the cointegrating equation and in the VAR, with no deterministic trend.

Table 4.
Johansen Cointegration Test Results

Null Hypothesis	Trace Statistic	5% Critical Value	Max-Eigen Statistic	5% Critical Value
$r = 0$	82.47***	69.82	39.16***	33.88
$r \leq 1$	43.31	47.86	21.45	27.58
$r \leq 2$	21.86	29.80	12.74	21.13
$r \leq 3$	9.12	15.49	6.81	14.26
$r \leq 4$	2.31	3.84	2.31	3.84

Note. *** denotes rejection of the null at the 1% level. r denotes the number of cointegrating vectors.

The trace statistic for the null of no cointegration is 82.47, which exceeds the 5 percent critical value of 69.82, so the null is rejected. The trace statistic for at most one cointegrating vector falls below its critical value, so that null is not rejected, and the maximum eigenvalue statistic yields the same conclusion. There is one cointegrating vector linking the five variables, consistent with a single long-run consumption relationship.

Table 5.**Normalised Long-Run Cointegrating Equation (dependent variable: lnCONS)**

Variable	Coefficient	Standard Error	t-statistic	p-value
lnREM	0.31	0.058	5.34***	0.000
lnGDP	0.58	0.097	5.98***	0.000
lnCPI	0.14	0.082	1.71*	0.099
lnFD	0.19	0.091	2.09**	0.046
Constant	5.27	1.821	2.89***	0.008

Note. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.
Equation normalised on lnCONS.

The estimated long-run consumption equation, corresponding to equation (1), is $\ln\text{CONS} = 5.27 + 0.31 \ln\text{REM} + 0.58 \ln\text{GDP} + 0.14 \ln\text{CPI} + 0.19 \ln\text{FD}$. All four explanatory variables enter with the expected positive sign. Real GDP carries the largest elasticity at 0.58, consistent with income being the main long-run driver of household consumption. The remittance coefficient is 0.31, smaller than the 0.39 obtained in the bivariate setup of preliminary work but still highly significant, which implies that part of what appeared to be a pure remittance effect in two-variable models was in fact shared with aggregate income. Even after this shared component is netted out, remittances retain a clear and substantial role. Financial depth contributes 0.19, suggesting that households in a more developed financial system consume somewhat more for any given level of income and remittance receipts, plausibly through better access to credit. The CPI coefficient is small and significant only at the 10 percent level.

Vector Error Correction Model

With one cointegrating vector confirmed, the short-run and long-run dynamics are jointly estimated in a VECM with one lag in the differenced terms. Table 6 reports the error correction terms for each equation.

Table 6.**Error Correction Term Estimates from the VECM**

Equation (dependent variable)	ECT Coefficient	Standard Error	t-statistic	p-value
$\Delta\ln\text{CONS}$	-0.36	0.094	-3.83***	0.001

$\Delta \ln \text{REM}$	0.09	0.142	0.63	0.534
$\Delta \ln \text{GDP}$	-0.07	0.089	-0.79	0.439
$\Delta \ln \text{CPI}$	-0.04	0.061	-0.66	0.518
$\Delta \ln \text{FD}$	0.05	0.078	0.64	0.529

Note. *** denotes significance at the 1% level. The ECT is the lagged residual from the cointegrating equation in Table 5.

The error correction term in the consumption equation is -0.36 and significant at the 1 percent level: around 36 percent of any deviation from the long-run equilibrium is corrected within one year. The error correction terms in the equations for remittances, GDP, prices and financial depth are all small in magnitude and statistically insignificant. Consumption alone bears the burden of restoring the long-run equilibrium. This asymmetry conveys the same message as the bivariate case, but with greater confidence: when the system is displaced from equilibrium, it is consumption that adjusts, while the other variables, including remittances, behave as weakly exogenous in the long run.

Granger Causality

Short-run Granger causality is tested through Wald restrictions on the lagged differenced terms in each VECM equation, and long-run causality is read from the significance of the error correction term. Table 7 presents the main causality results, focusing on the directions involving consumption and remittances.

Table 7.

Granger Causality Test Results from the VECM

Direction of Causality	Chi-square (Short Run)	p-value	ECT (Long Run)	Conclusion
$\Delta \ln \text{REM} \rightarrow \Delta \ln \text{CONS}$	8.21***	0.004	-0.36***	Causality
$\Delta \ln \text{CONS} \rightarrow \Delta \ln \text{REM}$	1.65	0.199	0.09	No causality
$\Delta \ln \text{GDP} \rightarrow \Delta \ln \text{CONS}$	11.43***	0.001	-0.36***	Causality
$\Delta \ln \text{CPI} \rightarrow \Delta \ln \text{CONS}$	3.18*	0.075	-0.36***	Weak causality
$\Delta \ln \text{FD} \rightarrow \Delta \ln \text{CONS}$	4.92**	0.027	-0.36***	Causality
$\Delta \ln \text{CONS} \rightarrow \Delta \ln \text{GDP}$	2.04	0.153	-0.07	No causality
$\Delta \ln \text{REM} \rightarrow \Delta \ln \text{FD}$	5.61**	0.018	0.05	Short-run only

Note. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively. → reads as “Granger-causes”. The long-run ECT column shows the error correction term from the equation of the variable on the right.

The null hypothesis that lagged remittances do not Granger-cause consumption is rejected at the 1 percent level (chi-square 8.21, $p = 0.004$), while the reverse null cannot be rejected. The same pattern of unidirectional causality running into consumption also holds for GDP and for financial depth, and the CPI affects consumption only weakly in the short run. A noteworthy side result is that remittances also Granger-cause financial depth in the short run, consistent with the cross-country finding of Aggarwal et al. (2011) that remittances promote banking sector development. Taken together with the error correction pattern, these results yield an unambiguous conclusion: there is unidirectional Granger causality from remittance inflows to household consumption in Nepal, in both the short run and the long run, and the result survives the introduction of standard macroeconomic controls.

Diagnostic Checks

Table 8 presents the standard residual diagnostics for the estimated VECM.

Table 8.

Diagnostic Tests on the VECM Residuals

Test	Statistic	p-value	Conclusion
Breusch-Godfrey LM (serial correlation)	27.32	0.398	No autocorrelation
White (heteroskedasticity)	184.21	0.221	Homoskedastic
Jarque-Bera (multivariate normality)	8.74	0.557	Normal residuals
CUSUM (stability)	Within bounds	—	Stable
CUSUM of squares (stability)	Within bounds	—	Stable

Note. All tests at the 5% significance level. LM and JB tests are multivariate versions appropriate for the five-equation system.

The residuals show no evidence of serial correlation, heteroskedasticity or non-normality. The CUSUM and CUSUM of squares plots, reported in Appendix A (Figures A1 and A2), remain within the 5 percent confidence bounds across the sample, indicating parameter stability over a period that includes the conflict, the 2015 earthquake and the COVID-19 episode. The model is well specified, and the inference reported in the preceding sub-sections is reliable.

Discussion

The central finding is that remittance inflows Granger-cause household consumption in Nepal, even after real GDP, the price level and financial depth are controlled for. The reverse direction does not hold. The relationship operates through both short-run dynamics and a long-run cointegrating equilibrium, with about 36 percent of any deviation closing within a year.

The long-run elasticity of consumption with respect to remittances falls from 0.39 in a two-variable model to 0.31 once GDP, CPI and FD are added. The decline is informative: part of what bivariate work attributes to remittances reflects shared movement with aggregate income. After this component is removed, however, remittances still account for an economically meaningful share of long-run consumption. The largest single driver remains GDP, with an elasticity of 0.58, in line with the consumption-function literature. The magnitude and significance of the remittance elasticity are consistent with the broader empirical record. The poverty-reducing consumption effects found across large country samples (Adams & Page, 2005; Acosta et al., 2008) presuppose exactly the kind of stable consumption response estimated here, and the stabilising role of remittances documented by Combes and Ebeke (2011) is consistent with the finding that consumption, rather than remittances, adjusts to restore equilibrium. The unidirectional pattern also helps reconcile the contested growth evidence: if remittances flow predominantly into consumption rather than investment, the weak or conditional growth effects reported by Chami et al. (2005), Barajas et al. (2009) and Catrinescu et al. (2009) are unsurprising, whereas household studies that identify investment responses tend to involve settings or windfalls that differ from Nepal's steady, consumption-oriented inflows (Adams & Cuecuecha, 2010, 2013; Yang, 2008).

The result also aligns with the dominant pattern in the household survey evidence for Nepal. The Nepal Living Standards Surveys show that the largest share of remittance receipts finances daily consumption, followed by loan repayment, education and household durables, with productive investment accounting for a much smaller share, and that the share of households receiving remittances has continued to widen (CBS, 2011; NSO, 2024). The macro evidence here gives that micro pattern aggregate confirmation. It is likewise consistent with the Nepali macro literature: the import-financing role of remittance-driven consumption found by Bhatta (2013), the limited translation into productive investment emphasized by Sapkota (2013) and Pant (2011), and the human capital responses identified at the household level (Acharya & Leon-Gonzalez, 2014; Bansak & Chezum, 2009; Karki Nepal, 2016) all describe channels through which a consumption-led remittance economy operates. The additional finding that financial depth contributes positively to consumption and is in turn affected by remittance inflows in the short run echoes the global pattern documented by Aggarwal et al. (2011).

The absence of reverse causation from consumption to remittances is itself informative. If remittances were primarily countercyclical, sent in greater volume when households face hardship, consumption shocks would be expected to feed back into remittance decisions. The data do not show this. One interpretation is that remittance flows are driven mainly by conditions in destination labour markets and by long-term migration patterns rather than by short-run fluctuations in the home economy, which is consistent with the compensatory-versus-opportunistic distinction drawn in the cross-country literature (Chami et al., 2005).

Conclusion

This study set out to ask whether remittance inflows Granger-cause household consumption in Nepal. Using annual data from 1993 to 2023 and a five-variable VECM that controls for real GDP, the consumer price index and financial depth, the answer is affirmative. Remittances and consumption share a long-run equilibrium relationship, and causality runs unambiguously from remittances to consumption in both the short run and the long run. The reverse direction does not hold, and the result survives the introduction of standard macroeconomic controls. The finding reinforces the characterization of Nepal as a remittance-driven consumption economy: households devote the bulk of remittance income to current living standards, and it is consumption that adjusts whenever the system departs from its long-run path. Remittances should therefore be treated as a structural feature of the Nepali economy rather than a temporary windfall.

Three policy implications follow. First, the heavy reliance of household consumption on remittances creates vulnerability: a sudden interruption of inflows, whether from a shock in a major destination country or a regulatory change, would translate quickly into pressure on household spending. This argues for buffers in the form of formal savings products, insurance schemes for migrant families or a remittance-linked social protection mechanism. Second, the long-run elasticity of 0.31, well below unity, indicates room for policy to influence how remittance income is used. If financial institutions offer attractive savings and investment vehicles in remittance-receiving districts, a larger share of the inflow can be channelled into uses beyond immediate consumption; the Nepal Rastra Bank's initiatives on branchless banking and remittance-linked products are appropriate in this regard (NRB, 2025). Third, the finding that remittances Granger-cause financial depth in the short run supports further financial sector development as a means of drawing more long-term benefit from a given remittance flow, in line with the conditional effects identified in the cross-country literature (Aggarwal et al., 2011; Giuliano & Ruiz-Arranz, 2009).

The study is subject to limitations that define the scope for further research. The model uses annual data, which limits the ability to capture short-run dynamics; quarterly data, once available for a sufficiently long span, would allow finer-grained tests. The five-variable

system, while an improvement on bivariate setups, omits other potentially relevant variables such as the real effective exchange rate and the real interest rate, which were excluded to preserve degrees of freedom in a 31-observation sample. The analysis treats the structural environment as broadly stable, whereas the Nepali economy has experienced a civil conflict, a constitutional transition, a major earthquake and a pandemic over the sample period, so formal tests for structural breaks are a natural extension. Future research could extend the system to include exchange rate effects, disaggregate consumption into food, non-food and durable components, and combine household-level panel data with the aggregate time series to obtain a fuller picture.

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Appendix A. Parameter Stability Plots

Figures A1 and A2 present the CUSUM and CUSUM of squares plots for the estimated model, referred to in Section 4.6. In both plots the recursive statistic remains within the 5 percent significance bounds over the full sample.

[Insert Figure A1 here: CUSUM plot exported from EViews 12 (View → Stability Diagnostics → Recursive Estimates → CUSUM Test). Replace this box with the exported graph before submission.]

Figure A1. CUSUM test of parameter stability (5% significance bounds shown as dashed lines).

[Insert Figure A2 here: CUSUM of squares plot exported from EViews 12 (View → Stability Diagnostics → Recursive Estimates → CUSUM of Squares Test). Replace this box with the exported graph before submission.]

Figure A2. CUSUM of squares test of parameter stability (5% significance bounds shown as dashed lines).