Received Date: Sept. 2025 Revised: Oct. 2025 Accepted: Dec. 2025

Determinants of Inflation in Nepal: Evidence from an ARDL–ECM Approach

Hemanta Rai [a], Sunit Shrestha [b]

[a]Assistant professor, Department of Economics, Patan Multiple Campus, raihemanta443@gmail.com hemanta.rai@pmc.tu.edu.np orcid id: https://0009-0008-1937-1115

[b] Patan Multiple Campus, sunitshrestha24@gmail.com, orcid id: https://orcid.org/0009-0004-1926-7298

Doi: https://doi.org/10.3126/ppj.v5i2.92859

Abstract

Inflation remains a key macroeconomic concern in Nepal, with important implications for economic stability, purchasing power, and policy effectiveness. Despite its relevance, empirical studies using recent data and modern time-series methods are limited. This study examines the determinants of inflation in Nepal using annual data from 1993 to 2024 and applies the Autoregressive Distributed Lag (ARDL) and Error Correction Model (ECM) framework. The ARDL approach is suitable for this analysis as it accommodates variables integrated of different orders and performs well in small samples. The model incorporates both domestic and external determinants of inflation, including GDP growth, broad money growth, remittances as a share of GDP, and Indian inflation. Unit root tests confirm mixed integration orders, and the ARDL bounds test provides strong evidence of a long-run cointegrating relationship among the variables. The empirical results indicate that inflation in Nepal is primarily driven by external price transmission and remittance-induced demand pressures. In the long run, Indian inflation and remittances have a positive and statistically significant effect on domestic inflation, reflecting Nepal's strong trade dependence on India and the demand-side impact of large remittance inflows. In contrast, GDP growth and broad money growth do not show significant long-run effects, suggesting weak domestic demand pressure and limited monetary transmission. Short-run dynamics reveal rapid adjustment toward long-run equilibrium, as indicated by a significant error correction term. Diagnostic and stability tests confirm the robustness of the model. Overall, the findings suggest that effective inflation control in Nepal requires coordinated policies that address external price shocks, improve domestic supply capacity, and promote the productive use of remittances alongside conventional monetary policy.

Keywords: Inflation, Remittances, External Price Transmission, ARDL–ECM, JEL codes: E31; E52; F24; F41; C22

1. Introduction

Inflation remains one of the most persistent macroeconomic challenges affecting both developed and developing economies, with particularly severe consequences for low-income countries. Sustained increases in the general price level erode purchasing power, distort resource allocation, discourage saving and investment, and disproportionately affect fixed-income and vulnerable households. As famously noted by Friedman (1963), inflation functions as an implicit form of taxation imposed without legislation. Consequently, identifying the determinants of inflation has long been a central concern for economists and policymakers, as price instability undermines economic growth and social welfare (Mankiw, 2002).

Nepal is no exception to this challenge. Since the introduction of formal price indices in the early 1970s, the country has experienced wide fluctuations in inflation, ranging from low single-digit rates to episodes exceeding 20 percent (IMF, 2001). Inflationary pressures in Nepal stem from a combination of domestic and external factors, including structural supply constraints, monetary expansion, remittance-driven demand growth, fuel and commodity price shocks, and strong price transmission from India due to trade dependence and a fixed exchange rate regime (NRB, 2006; Khan & Gill, 2010). Persistent inflation has adversely affected living standards, weakened international competitiveness, and complicated macroeconomic management, making price stability a primary objective of monetary policy pursued by Nepal Rastra Bank (Friedman & Schwartz, 1970).

Despite the importance of inflation control, empirical evidence on its determinants in Nepal remains limited and often based on outdated data. While extensive studies exist for other countries, few have examined Nepal's inflation dynamics using recent data and modern time-series techniques (Paudyal, 2014). Against this background, the present study investigates the short-run and long-run determinants of inflation in Nepal using annual data from 1995 to 2024. Employing the Autoregressive Distributed Lag (ARDL) and Error Correction Model (ECM) framework proposed by Pesaran, Shin, and Smith (2001), the study examines the roles of GDP growth, broad money growth, remittances, and Indian inflation in shaping domestic inflation dynamics. By providing updated and policy-relevant evidence, this study aims to contribute to the existing literature and support effective inflation management in Nepal.

2. Literature Review

This section reviews the theoretical and empirical literature on inflation and its determinants. It synthesizes key theoretical perspectives and international and country-specific empirical findings, with particular attention to developing and small open economies. The review highlights areas of consensus, points of divergence, and identifies gaps in the existing literature that motivate the present study.

2.1 Theoretical Perspectives on Inflation

Theoretical explanations of inflation broadly fall into monetarist, Keynesian, and expectations-based frameworks. Monetarist theory, rooted in the quantity theory of money, posits that inflation is primarily driven by excessive growth in the money supply relative to output (Friedman & Schwartz, 1970). From this perspective, sustained inflation is fundamentally a monetary phenomenon, and long-run price stability requires strict control over monetary expansion. In contrast, Keynesian theory emphasizes short-run demand–supply imbalances, identifying demand-pull inflation arising from excess aggregate demand, cost-push inflation resulting from rising production costs, and built-in inflation driven by wage–price spirals (Gordon, 1988).

Subsequent developments, particularly rational expectations theory, argue that inflation dynamics are strongly influenced by expectations and policy credibility. When economic agents anticipate persistent inflation, wage and price-setting behavior can perpetuate inflationary pressures even in the absence of contemporaneous shocks (Hanish, 2005). These competing frameworks suggest that inflation is shaped by a combination of monetary conditions, real-sector dynamics, structural rigidities, and institutional credibility, implying that empirical outcomes are likely to vary across countries and time periods (Wennerlind, 2005).

2.2 Empirical Evidence from International Studies

A large body of empirical literature documents a nonlinear relationship between inflation and economic growth. Early cross-country studies identify an inflation threshold commonly around 8 percent below which inflation has neutral or mildly positive effects on growth, but beyond which it significantly hampers investment, productivity, and economic performance (Sarel, 1996; Fischer, 1993; Ghosh & Phillips, 1998). These adverse effects are found to be particularly severe in low-income and developing economies with weaker institutions and shallow financial markets (Chaun, 2009).

Empirical evidence on the determinants of inflation highlights the dominant role of monetary and external factors, though their relative importance varies by context. Studies from high-inflation economies such as Nigeria and Zimbabwe find strong support for the monetarist view, with money supply growth closely tracking inflation (Moroney, 2002; David & Ann, 2014; Madesha et al., 2013). However, evidence from countries such as China and Nigeria also indicates that inflation may not be purely monetary, reflecting weak transmission mechanisms and structural constraints (Xie et al., 2009; Adenuga et al., 2012).

Interest rates and fiscal deficits have also been widely examined. The Fisher hypothesis suggests a one-to-one relationship between expected inflation and nominal interest rates

(Fama, 1975; 1977), a result supported in Turkey and Jordan (Gul & Ekinchi, 2006; Jaradat & Al-Hhosban, 2014). Fiscal deficits are found to be inflationary primarily when monetized through central bank financing, as evidenced in Pakistan, Sri Lanka, and several Latin American economies (Meltzer, 1989; Devapriya & Ichihashi, 2012; Yasmin et al., 2013). For open economies, exchange rate depreciation and imported inflation play a crucial role, particularly in trade-dependent countries (Imimole & Enoma, 2011; Patnaik, 2010).

More recent studies emphasize the role of remittances and external shocks. While remittances may reduce prices in the short run through exchange rate appreciation (Nath & Silva, 2012), they often generate demand-pull inflation in recipient economies such as Pakistan and Bangladesh (Mughal, 2012; Roy & Rahman, 2014). Overall, international evidence suggests that inflation dynamics are country-specific and shaped by monetary policy, fiscal discipline, external exposure, and structural characteristics.

2.3 Evidence from Nepal

Empirical studies on inflation in Nepal consistently underscore the importance of external price transmission and monetary factors. Early work by Neupane (1992) finds that money supply growth and external prices, particularly Indian inflation, are key drivers of domestic inflation, while structural bottlenecks also contribute to price pressures. The Institute for Sustainable Development (1994) reports that a 10 percent increase in Indian prices leads to nearly an 8 percent rise in Nepalese prices, highlighting strong imported inflation effects.

Subsequent studies provide mixed evidence regarding the dominance of monetary variables. Pant (1997) argues that inflation in Nepal is weakly linked to monetary aggregates and more closely associated with structural changes, whereas Sharma (1987) and NRB (2006) document a strong and near-unitary pass-through from Indian inflation. Bhusal and Silpakar (2001) identify a threshold inflation rate of approximately 6 percent, beyond which economic growth is adversely affected.

More recent studies employing modern time-series techniques reaffirm the importance of external and monetary factors. Paudyal (2014) finds that money supply, budget deficits, and Indian prices significantly influence inflation in both the short and long run. Chaudhary and Xiumin (2018) and Neupane (2022) further confirm that Indian inflation, broad money, and exchange rates are major long-run determinants of inflation in Nepal, with stable adjustment dynamics confirmed through error correction mechanisms and stability tests. However, evidence on the role of remittances remains limited and inconclusive, despite Nepal’s growing dependence on remittance inflows.

2.4 Research Gap

Although the existing literature provides valuable insights into inflation dynamics, several gaps remain in the context of Nepal. First, many Nepal-specific studies rely on outdated data and do not account for recent structural changes, including rising remittance inflows and increased exposure to external price shocks. Second, earlier research often focuses on a narrow set of variables primarily money supply, and Indian inflation while giving limited attention to the joint role of remittances, output growth, and monetary factors. Third, several studies employ static econometric techniques such as OLS, which may fail to capture dynamic adjustments and long-run equilibrium relationships inherent in macroeconomic time series.

This study addresses these gaps by employing the ARDL–ECM framework, which allows for mixed orders of integration and simultaneously captures short-run dynamics and long-run relationships. Using recent annual data, the study provides updated empirical evidence on the determinants of inflation in Nepal, with particular emphasis on remittance-driven demand pressures and external inflation transmission.

3. Methodology

This study examines the determinants of inflation in Nepal using annual time-series data for the 32 years period 1993–2024. Inflation is modeled as a function of domestic real activity, monetary conditions, remittance inflows, and external price pressures. Specifically, inflation is regressed on GDP growth, broad money (M2) growth, remittances as a percentage of GDP, and Indian inflation. The inclusion of remittances captures demand-side pressures arising from large external income inflows, while Indian inflation proxies external price transmission given Nepal’s strong trade dependence on India and its exchange rate peg. This specification is consistent with open-economy inflation models for small developing economies.

3.1 Unit root testing

Prior to model estimation, the time-series properties of the variables were examined using the Augmented Dickey–Fuller (ADF) test. The null hypothesis of the ADF test is the presence of a unit root. The results indicate mixed orders of integration: inflation, GDP growth, and M2 growth are stationary in levels [I (0)], while remittance-to-GDP and Indian inflation are stationary only after first differencing [I (1)]. None of the variables are integrated of order two. The presence of both I(0) and I(1) variables rules out conventional Johansen cointegration techniques and motivates the use of the Autoregressive Distributed

Lag (ARDL) modeling approach, which is valid under such conditions (Pesaran, & Shin, 1998).

3.2 Lag length selection

Optimal lag lengths were selected using information criteria, including the Akaike Information Criterion (AIC), Hannan–Quinn Criterion (HQIC), Schwarz Bayesian Information Criterion (SBIC), and the Final Prediction Error (FPE). Given the relatively small sample size, priority was given to parsimonious specifications to preserve degrees of freedom. The selected lag structure varies across variables, reflecting heterogeneous dynamic behavior. Based on these criteria, an ARDL (1, 2, 0, 1, 1) specification was chosen, which adequately captures both short-run adjustments and long-run relationships without over-parameterization.

3.3 ARDL bounds testing for cointegration

To examine the existence of a long-run equilibrium relationship among the variables, the ARDL bounds testing approach to cointegration was employed. This method tests the null hypothesis of no long-run relationship against the alternative of cointegration using an F-statistic and a t-statistic on the lagged dependent variable. The computed test statistics exceed the upper critical bounds at the 5% significance level, leading to rejection of the null hypothesis. These findings are further corroborated by the Johansen maximum likelihood cointegration test, which identifies multiple cointegrating vectors, thereby confirming the robustness of the long-run relationship. The bounds testing approach is particularly suitable for small samples and mixed integration orders (Pesaran et al., 2001).

3.4 ARDL- Model (ECM) specification

Given the evidence of cointegration, the ARDL model was reparametrized into an Error Correction Model (ECM) to simultaneously estimate short-run dynamics and long-run equilibrium adjustment. The ECM includes the lagged error correction term (ECT), which measures the speed at which inflation adjusts back to its long-run equilibrium following short-run shocks. A negative and statistically significant ECT coefficient confirms long-run causality running from the explanatory variables to inflation and indicates the stability of the estimated model (Engle & Granger, 1987). Short-run coefficients capture transitory effects, while long-run coefficients represent equilibrium relationships.

Given the presence of cointegration among the variables, the Autoregressive Distributed Lag (ARDL) model is reparametrized into an Error Correction Model (ECM) to capture both short-run dynamics and long-run equilibrium relationships (Pesaran, & Shin, 1998).

The general ECM representation corresponding to the estimated ARDL (1, 2, 0, 1, and 1) model is specified as:

$$\Delta \mathrm{INFt} = \alpha 0 + \sum_{i=1}^{1} \alpha i \Delta \mathrm{INF}_{t-1} + \sum_{j=0}^{1} \beta j \Delta \mathrm{GDP}_{t-j} + \sum_{k=0}^{0} \gamma k \Delta \mathrm{M2}_{t-k} + \sum_{l=0}^{0} \delta l \Delta \mathrm{REM}_{t-1} + \sum_{m=0}^{0} \phi m \Delta \mathrm{IIR}_{t-m} + \lambda ECT_{t-1} + \varepsilon t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (i)$$

Where the error correction term is defined as:

$$ECT_{t-1} = INF_{t-1} - \theta_1 GDP_{t-1} - \theta_2 M2_{t-1} - \theta_3 REM_{t-1} - \theta_4 IIR_{t-1}$$

In this specification, Δ denotes the first-difference operator, and εt is a white-noise error term. The coefficient λ represents the speed of adjustment toward long-run equilibrium. A negative and statistically significant λ confirms the existence of a stable long-run relationship and indicates that deviations from equilibrium are corrected over time. Short-run coefficients capture transitory effects of changes in the explanatory variables, while the long-run coefficients (θi) represent equilibrium relationships among the variables (Engle & Granger, 1987; Pesaran et al., 2001).

3.5 Description of Variables

Inflation (INF): Inflation is measured as consumer prices annual percent change serving as the dependent variable in the model. It captures overall price movements in the economy and reflects both domestic and external inflationary pressures.

GDP Growth (GDP): GDP growth represents the annual growth rate of real gross domestic product and serves as a proxy for domestic economic activity. Higher economic growth may exert demand-pull inflationary pressure; however, in developing economies, this relationship may be weak due to structural rigidities.

Broad Money Growth (M2): Broad money growth (M2) measures the annual growth rate of the money supply, including currency in circulation and deposits. It captures monetary expansion and is commonly used to assess the role of monetary policy in influencing inflation.

Remittance-to-GDP Ratio (REM): Remittances are measured as a percentage of GDP and represent external income inflows from migrant workers. Remittances can increase aggregate demand, particularly for non-tradable goods and services, thereby exerting inflationary pressure in the long run.

Indian Inflation (IIR): Indian inflation is included as a proxy for external price shocks. Given Nepal's high trade dependence on India and the fixed exchange rate regime, changes in Indian prices are expected to transmit directly into domestic inflation through import prices and cost channels. All the independent variables and the dependent variables are expressed in percentages as growth rates thus we do not use the log transformation of these variables following (Pesaran, & Shin, 1998).

3.6 Diagnostic and stability tests

To ensure the reliability of the estimated ARDL–ECM, a comprehensive set of diagnostic tests was conducted. Multicollinearity was assessed using the Variance Inflation Factor (VIF), serial correlation was tested using the Breusch–Godfrey LM test, heteroscedasticity was examined using the Breusch–Pagan/Cook–Weisberg test, and residual normality was evaluated using the skewness–kurtosis test. In addition, parameter stability was assessed using cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests, which evaluate whether the estimated coefficients remain stable over the sample period (Brown, Durbin, & Evans, 1975). The diagnostic results confirm that the classical regression assumptions are satisfied and that the estimated model is structurally stable.

3.7 Nature and sources of data

The study employs time series data spanning from 1993 to 2024, 32 years to examine the relationship between inflation and its potential determinants. All variables are expressed in percentage terms, and therefore, no logarithmic transformation has been applied. The data for the study are secondary in nature and have been obtained from the World Bank's World Development Indicators (2025 edition), which provides reliable and consistent information for cross-year analysis. The variables used in the study, along with their respective sources and periods, are summarized in Table 1 below:

Table 1: Data source

Variable	Source	Period
Inflation (INF)	World Bank, World Development Indicators, 2025	1993–2024
GDP Growth (GDP)	World Bank, World Development Indicators, 2025	1993–2024
Money Supply Growth (M2)	World Bank, World Development Indicators, 2025	1993–2024
Remittance (REM)	World Bank, World Development Indicators, 2025	1993–2024
Indian Inflation Rate (IIR)	World Bank, World Development Indicators, 2025	1993–2024

This dataset provides comprehensive coverage of macroeconomic indicators relevant to the Nepalese economy and allows for robust econometric analysis of inflation dynamics over the selected period.

4. Results and Discussion

This section presents the estimation results from the ARDL modeling approach. After establishing the time-series properties of the variables and testing for cointegration, long-run and short-run coefficients are estimated through the ARDL–ECM specification. Model adequacy is evaluated using standard diagnostic and stability tests.

4.1 Results from unit root test

The Augmented Dickey-Fuller (ADF) test was employed to examine the stationarity properties of the variables. The results, presented in Table 2, indicate mixed orders of integration. Inflation, GDP growth, and M2 growth are stationary at level [I (0)], as evidenced by test statistics more negative than the 5% critical value (-2.983) and p-values less than 0.05. In contrast, Remittance as a percentage of GDP and Indian Inflation are non-stationary at level but become stationary after first differencing [I (1)], with p-values of 0.0000 in their differenced forms. This mixed integration order necessitates the use of an Autoregressive Distributed Lag (ARDL) model, which accommodates both I (0) and I (1) variables and is appropriate for cointegration analysis through bounds testing.

Table 2: Unit Root Test Results

Variable	**Level Test**	**Test Stat**	**p-value**	**Decision at 5%**	**First Diff Test**	**Test Statistic**	**p-value**	**Order of Integration**
INF	ADF(0)	-3.77	0.003	Reject H_0	Not required	-	-	I(0)
GDP	ADF(0)	-6.21	0.000	Reject H_0	Not required	-	-	I(0)
M2	ADF(0)	-4.76	0.000	Reject H_0	Not required	-	-	I(0)
REM	ADF(0)	-1.00	0.750	Fail to reject	ADF(0)	-4.974	0.000	I(1)
IIR	ADF(0)	-2.63	0.085	Fail to reject	ADF(0)	-7.490	0.000	I(1)

Source: Authors own calculations from STATA 14.2

4.2 Optimal lag length selection

Lag length selection was conducted using information criteria for both the full VAR system and individual variables. For the five-variable system, the Akaike Information Criterion

(AIC), Hannan-Quinn Criterion (HQIC), and Final Prediction Error (FPE) selected four lags, while the Schwarz Bayesian Information Criterion (SBIC) favored one lag in Table 4. Given the relatively small sample size (32 annual observations), a compromise of two lags was adopted for the system-wide analysis. At the individual level shown in Table 3, inflation, remittance share, and Indian inflation exhibit first-order autoregressive processes (AR (1)), GDP growth follows an AR (2) process, while money supply growth shows no significant persistence (AR (0)). This mixed lag structure informed the specification of an ARDL model accommodating these differential dynamics

Table 3: Optimal lag for each variable

Variable	AIC	HQIC	SBIC	Selected Lag
IINF	1	1	0	1
GDP	2	2	2	2
M2	0	0	0	0
REM	1	1	1	1
IIR	1	1	1	1

Source: Authors own calculations from STATA 14.2

Table 4: Optimal lag for the model

Lag	AIC	HQIC	SBIC	FPE	LL
0	27.40	27.47	27.64	546215	-378.6
1	24.90	25.33	26.33*	46265.8	-318.6
2	25.83	26.63	28.44	141694	-306.6
3	25.24	26.41	29.05	138102	-273.4
4	21.99*	23.52*	26.99	22789.6*	-202.9

Source: Authors own calculations from STATA 14.2

The lag selection process revealed tensions between different information criteria, with AIC/HQIC favoring richer dynamics (4 lags) and SBIC favoring greater parsimony (1 lag). The small sample size (n=32) limits the number of lags that can be reliably estimated. Future research with longer time series could explore more complex dynamic specifications

4.3 Cointegration test and bound test

Cointegration was tested using both the ARDL bounds test and Johansen maximum likelihood procedure. The Johansen trace test identified three cointegrating vectors among the five variables (trace statistic = 11.45 for rank 3, below the 15.41 critical value) as shown in Table 5 below. These results confirm the existence of stable long-run equilibrium relationships between Nepal's inflation and its determinants, justifying the use of an error correction modeling framework.

Table 5: Johansen Cointegration test result

Rank (r)	Log Likelihood	Eigenvalue	Trace Statistic	5% Critical Value	Conclusion
r = 0	-284.77	-	163.72	68.52	Reject (at least 1 CV)
r = 1	-244.90	0.942	83.96	47.21	Reject (at least 2 CVs)
r = 2	-225.28	0.753	44.74	29.68	Reject (at least 3 CVs)
r = 3	-208.64	0.695	11.45*	15.41	Fail to reject
r = 4	-205.04	0.226	4.25	3.76	Reject
r = 5	-202.91	0.140	-	-	-

Note: Selected Rank: r = 3 (3 cointegrating vectors), lags: 4, Trend specification: Constant in cointegrating equation

Source: Authors own calculations from STATA 14.2

The ARDL bounds test result shown in Table 6 yielded an F-statistic of 6.883 and a t-statistic of -5.621, both exceeding the Pesaran et al. (2001) critical values for I (1) regressors at the 5% significance level, rejecting the null hypothesis of no long-run relationship.

Table 6: Bounds test result

Test Statistic	Value	Critical Values (5%)	Decision Rule	Conclusion
F-statistic	6.88	I(0) = 2.86, I(1) = 4.01	F > I(1) = Reject H_0	Cointegration exists
t-statistic	-5.62	I(0) = -2.86, I(1) = -3.99	t < I(1) = Reject H_0	Cointegration exists

Note: H_0: No long-run relationship (no cointegration), k: 4 regressors (GDP, M2, REM, IIR)

Source: Authors own calculations from STATA 14.2

Given the mixed integration orders (I (0) and I (1) variables) and evidence of cointegration from both tests, an Autoregressive Distributed Lag (ARDL) model with error correction mechanism was selected. This approach accommodates variables with different orders of integration while capturing both short-run dynamics and long-run equilibrium relationships, consistent with the economic theory of inflation determination in Nepal

4.4 Results from ARDL-ECM model

The ARDL–ECM results based on the ARDL (1, 2, 0, 1, and 1) specification provide strong evidence of a stable long-run relationship among inflation, remittances, and external price conditions over the period 1993–2024. The error correction term (ECT) is negative and highly statistically significant, confirming the presence of cointegration among the variables. Its magnitude (−1.24) indicates a rapid speed of adjustment, implying that more than the full extent of any short-run disequilibrium in inflation is corrected within one year, with some degree of overshooting before convergence to the long-run equilibrium (See Table 8).

In the long run (Table 7), remittance inflows and Indian inflation are the principal determinants of domestic inflation. Remittances as a share of GDP exert a positive and statistically significant effect, suggesting that increased remittance-driven demand contributes to sustained inflationary pressure in the economy. Indian inflation has a large and highly significant coefficient, highlighting strong external price transmission to Nepal, which is consistent with the country's heavy trade dependence on India and the exchange rate peg. In contrast, GDP growth and broad money growth are statistically insignificant in the long run, indicating that domestic output expansion and monetary growth do not independently drive long-run inflation dynamics.

Table 7: Long run coefficients results

Variable	Coefficient	Std. Error	t-statistic	p-value
Error Correction Term (ECT)	-1.243	0.221	-5.62	0.000***
GDP	0.079	0.295	0.27	0.790
M2	0.007	0.041	0.19	0.849
REM	0.075	0.030	2.51	0.021**
IIR	0.800	0.120	6.64	0.000***
R square	0.75			
Adjusted R square	0.65			
observations	32			
RMSE	1.86			

Note: * indicates marginal significance at 10% level, *** p<0.01, ** p<0.05, * p<0.10
Source: Authors own calculations from STATA 14.2

Short-run dynamics reveal limited influence of domestic variables on inflation adjustments. Changes in GDP growth and remittances do not have statistically significant short-run effects, suggesting that their inflationary impact materializes primarily through long-run demand channels. Changes in Indian inflation exhibit a marginally significant negative short-run effect, indicating temporary adjustment or absorption mechanisms that delay immediate pass-through to domestic prices.

Table 8: Short run dynamics results

Variable	Lag	Coefficient	Std. Error	t-statistic	p-value

GDP	D1	-0.095	0.253	-0.38	0.712
	LD	-0.051	0.170	-0.30	0.767
REM	D1	0.060	0.179	0.34	0.741
IIR	D1	-0.448	0.251	-1.79	0.089*
Constant	-	-0.613	2.048	-0.30	0.768
R square	0.758				
Adjusted R square	0.650				
observations	32				
RMSE	1.863				

Note: * indicates marginal significance at 10% level, *** p<0.01, ** p<0.05, * p<0.10

Source: Authors own calculations from STATA 14.2

Overall, the results suggest that Nepal's inflation is largely shaped by external price developments and remittance-induced demand pressures, while short-run inflation movements are dominated by adjustment toward long-run equilibrium rather than domestic cyclical factors.

4.5 Diagnostic tests results

4.5.1 Multicollinearity test

The Variance Inflation Factor (VIF) test was conducted to assess multicollinearity among the independent variables. As presented in Table 9, all VIF values range between 1.03 and 1.06, with a mean VIF of 1.04. These values are well below the conservative threshold of 5 and even below the stricter threshold of 2, indicating no significant multicollinearity concerns. The near-perfect VIF values (close to 1) suggest that each independent variable GDP growth, M2 growth, remittances as a percentage of GDP, and Indian inflation provides unique explanatory power for Nepal's inflation without redundant information. This statistical independence allows for clear interpretation of each variable's individual effect on inflation

Table 9: VIF test results

Variable	VIF	1/VIF
Indian Inflation IIR	1.06	0.9456
Broad Money M2 Growth	1.04	0.9574
Remittance/GDP	1.04	0.9662
GDP Growth	1.03	0.9753
Mean VIF	1.04	-

Source: Authors own calculations from STATA 14.2

4.5.2 Autocorrelation test

The Breusch-Godfrey Lagrange Multiplier test was employed to test for serial correlation in the residuals. The test results, presented in Table 10 below, show chi-square statistics of 0.113 (p=0.7366) for first-order autocorrelation and 3.445 (p=0.1786) for second-order autocorrelation. Both p-values exceed the conventional 5% significance level, indicating no evidence of serial correlation.

Table 10: Autocorrelation test results

Lag	Test Statistic	D.F	p-value	Null Hypothesis (H_0)	Conclusion
Lag 1	$\chi^2(1) = 0.113$	1	0.7366	No serial correlation	Fail to reject H_0
Lag 2	$\chi^2(2) = 3.445$	2	0.1786	No serial correlation	Fail to reject H_0

Source: Authors own calculations from STATA 14.2

4.5.3 Heteroscedasticity test

Diagnostic tests were conducted to verify the classical linear regression assumptions. The Breusch-Pagan/Cook-Weisberg test for heteroscedasticity presented in Table 11 below yielded a chi-square statistic of 0.92 with a p-value of 0.3367, indicating no evidence of non-constant error variance.

Table 11: Heteroscedasticity test result

Test	Null Hypothesis (H_0)	Alternative Hypothesis (H_1)	Test Statistic	p-value	Conclusion
Breusch-Pagan/Cook-Weisberg	Constant variance (Homoscedasticity)	Non-constant variance (Heteroscedasticity)	$\chi^2(1) = 0.92$	0.3367	Fail to reject H_0

Source: Authors own calculations from STATA 14.2

4.5.4 Normality test

The skewness/kurtosis test for normality produced a joint chi-square statistic of 1.36 with a p-value of 0.5060, failing to reject the null hypothesis of normally distributed residuals as shown in Table 12 below:

Table 12: Normality test results

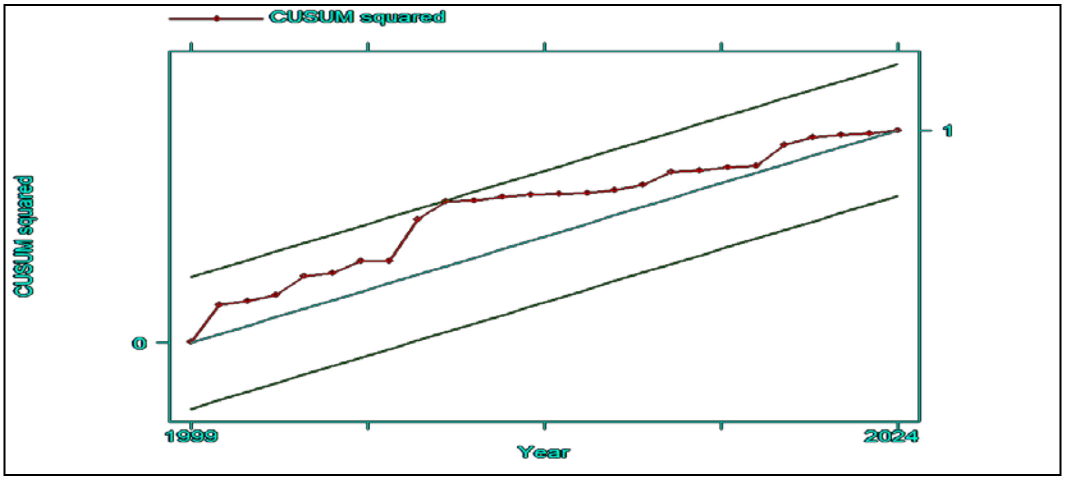
Test Component	Statistic/Value	p-value	Conclusion
Skewness Test	-	0.4750	Residuals are symmetric ($p > 0.05$)
Kurtosis Test	-	0.3834	Residuals have normal kurtosis ($p > 0.05$)
Joint Test (Adj. χ^2)	$\chi^2(2) = 1.36$	0.5060	Residuals are normally distributed
Overall	-	-	Normality assumption satisfied

Source: Authors own calculations from STATA 14.2

These results, combined with previously reported low Variance Inflation Factors (mean VIF = 1.04), confirm that the ordinary least squares assumptions are satisfied, validating the use of standard inference procedures for hypothesis testing.

4.5.5 Stability test

The CUSUM squared test was employed to assess the structural stability of the estimated model over the period spanning 1999 to 2024 (only showing 24 years as CUSUM uses recursive residuals, which can only be computed after losing initial observations due to lags and model initialization). Figure 1: stability test



Source: Authors own calculations from STATA 14.2

As depicted in the time series plot (Figure 1), the CUSUM squared statistic (red line) remains consistently within the bounds defined by the upper and lower 5% significance limits (green lines), with no discernible breaches throughout the sample period.

This behavior indicates the absence of significant structural breaks in the model parameters, thereby supporting the null hypothesis of parameter stability. The central cyan line represents the expected trajectory under the null, and the observed statistic's adherence to this path further reinforces the model's robustness. Overall, the results suggest that the model exhibits stable behavior across the examined timeframe, validating its reliability for longitudinal analysis.

4.6 Discussion

The results show that inflation in Nepal is mainly influenced by factors outside the domestic economy rather than by internal economic growth or money supply. In particular, inflation in India has a strong and lasting effect on inflation in Nepal. This reflects Nepal's heavy dependence on imports from India and the fixed exchange rate system, which allows price changes in India to pass directly into domestic prices. These findings support earlier studies that highlight the importance of imported inflation in Nepal (NRB, 2006; Paudyal, 2014; Neupane, 2022). The results also show that GDP growth does not have a significant long-run effect on inflation, suggesting that economic expansion in Nepal has not created strong demand pressure. Similarly, broad money growth is not a key long-run driver of inflation, indicating that the monetary transmission mechanism in Nepal is relatively weak.

Another important finding is the role of remittances in increasing inflation in the long run. Remittance inflows raise household income and consumption, especially for housing, services, and non-tradable goods, which puts upward pressure on prices over time. This result is consistent with evidence from other remittance-dependent economies (Roy & Rahman, 2014; Mughal, 2012). In the short run, most variables have limited influence on inflation, and price movements mainly reflect adjustment toward long-run equilibrium. The significant error correction term shows that inflation adjusts quickly after short-term shocks, although some overshooting occurs. Overall, the findings suggest that controlling inflation in Nepal requires more than tight monetary policy; policymakers also need to manage external price shocks and reduce supply constraints while encouraging productive use of remittances.

5. Conclusion and Policy Recommendations

This study has empirically investigated the determinants of inflation in Nepal using the ARDL–ECM framework, with annual data spanning 1993–2024. The results confirm a stable long-run relationship among the variables, with the error correction term indicating rapid adjustment to equilibrium more than full correction within one year highlighting the responsiveness of inflation to disequilibrium shocks.

The core findings reveal that inflation in Nepal is predominantly externally driven, shaped by two key forces:

i. Indian inflation, which exerts a strong and statistically significant long-run effect, reflecting Nepal's deep trade integration, fixed exchange rate regime, and high import dependence.

ii. Remittance inflows (as a share of GDP), which significantly contribute to long-run inflationary pressure through demand-side channels, particularly in non-tradable sectors.

In contrast, domestic factors such as GDP growth and broad money (M2) growth were found to be statistically insignificant in the long run. This suggests weak domestic demand-pull pressures and an ineffective monetary transmission mechanism, underscoring the limited role of conventional monetary policy in controlling inflation in Nepal's context.

Short-run dynamics are dominated by the adjustment process itself, with most domestic variables showing no significant immediate impact on inflation. This further emphasizes that inflation in Nepal is less a cyclical domestic phenomenon and more a structural and externally influenced process.

5.1 Policy Recommendations

Based on the finding that inflation in Nepal is driven primarily by external price shocks and remittance-induced demand rather than domestic monetary growth or output policy must look beyond conventional monetary tightening. To mitigate imported inflation, authorities should enhance trade diversification, establish strategic buffer stocks for essential commodities, and strengthen early warning systems to monitor Indian price trends. Simultaneously, remittance inflows should be channeled toward productive investments in agriculture, manufacturing, and infrastructure through targeted financial instruments and incentives, reducing their inflationary demand-side pressure while boosting domestic supply capacity.

Effective inflation control further requires a coordinated policy framework that addresses structural constraints. Monetary policy should employ macro prudential tools to curb non-productive credit, while fiscal policy prioritizes supply-enhancing investments in logistics, irrigation, and market connectivity. Improving domestic production efficiency and reducing supply-side bottlenecks will help absorb external and remittance-driven demand pressures, ensuring that price stability is achieved without undermining growth.

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