

Inflation and Fiscal Deficit: Examining the Long-Run Relationship in Nepal, 1990–2023

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Abstract

This paper examines the long-run relationship between fiscal deficit and inflation in Nepal, asking whether the deficit-inflation nexus that dominates the macroeconomic literature operates in an economy with a fixed peg to a much larger neighbor. The analysis uses annual data from 1990 to 2023 within a five-variable vector error correction framework that includes the consumer price index, the fiscal deficit, broad money supply, India's consumer price index, and nominal GDP. All five series are integrated of order one, and the Johansen procedure identifies one cointegrating vector. The estimated long-run elasticity of inflation with respect to the fiscal deficit is 0.09, positive and significant but small in economic terms. The Indian CPI elasticity is 0.74, by far the dominant driver of Nepali inflation, while broad money contributes 0.31 and nominal GDP enters with a negative effect of -0.14. An asymmetric specification finds that inflation responds with an elasticity of 0.16 to expansions in the fiscal deficit but only 0.03 to contractions, with a Wald test rejecting symmetry at the five percent level. Sub-period analysis shows that the deficit-inflation elasticity rose from 0.05 in the pre-2010 era to 0.13 in the federalism-era deficit expansion, before stabilizing at 0.11 in the disrupted 2020–2023 window. The error correction term in the inflation equation is -0.31 and significant, indicating moderately fast adjustment. The findings reconcile the standard deficit-inflation framework with Nepal's peg-driven price formation, showing that fiscal deficits matter quantitatively for inflation but only at the margin and primarily through the monetary transmission channel.

Keywords: Inflation, Fiscal deficit, Monetary policy, Cointegration, Fixed exchange rate, Asymmetric response, VECM

Introduction

The relationship between fiscal deficits and inflation is one of the oldest and most contested questions in macroeconomic policy. In Nepal, the question carries practical weight that goes beyond the theoretical debate. The fiscal deficit averaged around 2 percent of GDP through the 1990s and 2000s but rose sharply after the 2015 constitution, peaking above 7 percent in 2020 before subsiding to around 4 percent by 2023 (Ministry of Finance [MOF], 2023). Over the same window, headline inflation moved between 4 and 11 percent, with sharp spikes during the 2008 commodity price episode, the 2015 earthquake and blockade, and the 2022 post-COVID recovery (Nepal Rastra Bank [NRB], 2023). Whether the deficit expansion of the post-2015 period was inflationary, and if so by how much, is the empirical question that motivates this paper.

The theoretical literature offers two contrasting frameworks for thinking about deficits and prices. The monetarist position, developed by Friedman (1968) and crystallized in the unpleasant monetarist arithmetic of Sargent and Wallace (1981), holds that deficits affect inflation only to the extent that they are monetized. A deficit financed by genuine government borrowing from the public, at a market interest rate, transfers purchasing power without creating it and is therefore non-inflationary in the long run. A deficit financed by money creation, whether direct or through central bank purchase of government securities at non-market rates, increases the money stock and produces inflation through the standard quantity-theoretic channel. The Keynesian view, by contrast, treats deficits as a direct stimulus to aggregate demand, with inflation following when the economy approaches capacity, regardless of how the deficit is financed. The fiscal theory of the price level developed by Leeper (1991), Sims (1994), Woodford (1995), and Cochrane (1998) goes further still, treating the price level as determined by the expected real value of government surpluses, with inflation rising whenever the fiscal trajectory is perceived as unsustainable.

The empirical literature has reached mixed conclusions, with the answer depending critically on country circumstances. Catão and Terrones (2005) used a large panel of developing and developed countries and found a strong long-run deficit-inflation link in high-inflation economies but a weaker one elsewhere. Lin and Chu (2013) examined public debt and inflation across 91 countries and reached similar conclusions about heterogeneity. Aghevli and Khan (1978) provided the early empirical case for the monetization channel in developing countries, and Fischer (1993) embedded the deficit-inflation relationship in a broader growth framework. For economies with fixed exchange rates, the analysis takes a particular form because the domestic price level is anchored to the anchor currency's price level. In such regimes, the deficit-inflation relationship operates only within the space the peg leaves for domestic price determination, typically the non-tradables sector and the segments of the consumer basket that respond to domestic demand rather than to imported prices.

Nepal's monetary regime fits this pattern closely. The fixed peg to the Indian rupee, maintained since 1993, has anchored the price level to India's inflation trajectory, and Nepali inflation has tracked Indian inflation with a correlation coefficient above 0.85 across the sample period (NRB, 2023). This makes Nepal a natural laboratory for testing whether the deficit-inflation relationship survives in an economy where the dominant inflation driver is external. The existing Nepali literature has examined inflation determinants in various frameworks but has reached different conclusions about the role of fiscal variables.

Khatriwada (1994) estimated an early model of Nepali inflation and found that monetary variables dominated. Ginting (2007) applied cointegration methods to monthly data and found that Nepali and Indian prices converge in the long run, with the pass-through from India completed in about seven months. Paudel (2014) worked on a related external channel, examining the link between workers' remittances and the exchange rate in Nepal. Paudyal (2014) estimated a single-equation error correction model for Nepal over 1975–2011 using budget deficits, Indian prices, broad money, the exchange rate and real GDP, and reported that the budget deficit is significant in the long run alongside the monetary and imported-price terms. NRB working papers and IMF Article IV consultations have repeatedly raised concerns about the inflationary potential of deficit expansion without resolving the question empirically (IMF, 2023; NRB, 2023). What is missing from this work is a unified treatment that brings the fiscal deficit, the monetary aggregate, the imported inflation channel, and the activity variable into a single cointegrating system, tests the direction of long-run causality, and asks whether the relationship has been stable across the federalism-era deficit expansion.

The contribution of this paper is threefold. First, it estimates a five-variable VECM that captures the long-run relationship between Nepali inflation and the fiscal deficit while controlling for the monetary aggregate, the imported inflation anchor through Indian CPI, and the activity variable. The size of the deficit coefficient quantifies how much the deficit-inflation channel operates in an economy where most of the price level is determined externally. Second, the paper tests for asymmetric response by decomposing fiscal deficit changes into positive and negative components, asking whether inflation responds more to deficit expansions than to deficit contractions. Third, the paper estimates sub-period elasticities for four phases of the Nepali fiscal experience to test whether the post-2015 deficit expansion produced a measurable change in the elasticity.

Two views of the deficit-inflation nexus dominate the literature: the monetarist position that deficits matter only through monetization and the fiscal-theory position that they matter directly through expected fiscal solvency. The Nepali data are well placed to discriminate between them because the country's monetary regime is largely passive, with the peg to the Indian rupee removing most of the discretionary inflation-creating capacity that the fiscal-theory framework requires. What follows tests where, between these two positions, the Nepali experience actually falls? Section 2 sets out the data and the econometric framework. Section 3 reports the empirical results. Section 4 interprets the findings and draws implications for fiscal-monetary coordination. Section 5 closes.

Research Methods

The empirical analysis uses annual data from 1990 to 2023, giving 34 observations across five variables. The consumer price index (CPI), with base year 2014, is taken from the Nepal Rastra Bank (NRB, 2023). The fiscal deficit (DEF) is measured as total government expenditure minus total revenue in nominal local currency, taking the absolute value of the deficit (which is positive throughout the sample period because expenditure exceeded revenue every year) from the Economic Survey (MOF, 2023). Broad money supply (M2), in nominal local currency, captures the monetary transmission channel from deficits to prices and is taken from the NRB monetary statistics. India's consumer price index (IND_CPI), with a corresponding base year of 2014, is taken from the Reserve Bank of India (RBI, 2023) and captures the imported inflation channel that the fixed peg makes empirically dominant. Nominal GDP (GDP), in local currency, comes from the Central Bureau of Statistics (CBS, 2023) and captures the activity scale variable. All five variables are converted to natural logarithms and are referred to as $\ln\text{CPI}$, $\ln\text{DEF}$, $\ln\text{M2}$, $\ln\text{IND}$, and $\ln\text{GDP}$ in what follows.

The choice of variables follows the deficit-inflation literature. The dependent variable is the price level, and the explanatory variables capture the three principal channels through which the deficit could, in principle, affect inflation. The monetary channel is captured through M2, which mediates the unpleasant monetarist arithmetic mechanism (Sargent & Wallace, 1981). The imported inflation channel, central to any small open economy under a fixed peg, is captured through the Indian CPI. The aggregate demand channel is captured through nominal GDP, which serves as both an activity scale variable and a control for the level effect of nominal growth on the price level. With these three channels controlled for, the residual elasticity of CPI with respect to the deficit captures the direct fiscal channel net of monetization and demand effects. The 34-year window covers the pre-VAT-era fiscal regime, the post-1997 modernization, the conflict and recovery period, the federalism-era deficit expansion, and the COVID-19 and balance-of-payments-stress disruption.

The estimation strategy follows the standard sequence used in applied cointegration work. The order of integration is established first using the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979) and the Phillips-Perron (PP) test (Phillips & Perron, 1988). The ADF regression takes the general form

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

Where Δ is the first-difference operator, t is a time trend included where the data show one, the lagged differences absorb residual serial correlation, and ε_t is a white noise error. The lag length is selected using the Schwarz information criterion. The null hypothesis of a unit root corresponds to $\gamma = 0$, tested against the alternative $\gamma < 0$. The Phillips-Perron test uses a non-parametric correction in place of the lagged differences and provides a robustness check. Variables that fail to reject the unit root null in levels but reject it in first differences are classified as $I(1)$.

Provided that all five variables are $I(1)$, the next step is to test for cointegration using the Johansen (1988, 1991) procedure, based on the unrestricted vector autoregression of order p ,

$$Y_t = A_0 + \sum_{i=1}^p A_i Y_{t-i} + \varepsilon_t, \quad (2)$$

where $Y_t = (\ln\text{CPI}_t, \ln\text{DEF}_t, \ln\text{M2}_t, \ln\text{IND}_t, \ln\text{GDP}_t)'$ is a 5×1 vector of the endogenous variables. Reparameterizing equation (2) in error correction form yields

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \mu + u_t, \quad (3)$$

where Π is a 5×5 long-run impact matrix whose rank r determines the number of cointegrating vectors. The Johansen procedure tests the rank using the trace and maximum eigenvalue statistics. When $0 < r < 5$, the matrix factors as $\Pi = \alpha\beta'$, with β containing the cointegrating vectors and α the adjustment coefficients. The lag length k is chosen using the Akaike, Schwarz, and Hannan-Quinn criteria.

When one cointegrating vector is identified, it is normalized on the price level to give the long-run inflation relationship,

$$\ln CPI_t = \beta_0 + \beta_1 \ln DEF_t + \beta_2 \ln M2_t + \beta_3 \ln IND_t + \beta_4 \ln GDP_t + \varepsilon_t \quad (4)$$

Where β_1 is the long-run elasticity of inflation with respect to the fiscal deficit and is the central object of interest. A positive and significant β_1 supports the existence of a deficit-inflation channel net of the monetary, external, and activity controls. The coefficient β_2 captures the monetary channel that the unpleasant monetarist arithmetic emphasizes (Sargent & Wallace, 1981). The coefficient β_3 captures the peg-mediated imported inflation channel and is expected to be large given the close correlation between Nepali and Indian inflation. The coefficient β_4 captures the activity effect, with the sign ambiguous depending on whether output growth absorbs price pressures (negative) or generates them through demand (positive). The lagged residual from equation (4) defines the error correction term,

$$ECT_{t-1} = \ln CPI_{t-1} - \beta_0 - \beta_1 \ln DEF_{t-1} - \beta_2 \ln M2_{t-1} - \beta_3 \ln IND_{t-1} - \beta_4 \ln GDP_{t-1} \quad (5)$$

which measures the deviation from the long-run inflation path at time $t-1$. The VECM equation for inflation, on which the short-run analysis is based, takes the form

$$\Delta \ln CPI_t = \alpha_1 + \lambda_1 ECT_{t-1} + \sum_i \Psi_{1i} \Delta \ln CPI_{t-i} + \sum_i \Phi_{1i} \Delta \ln DEF_{t-i} + \sum_i \Phi_{2i} \Delta \ln M2_{t-i} + \sum_i \Phi_{3i} \Delta \ln IND_{t-i} + \sum_i \Phi_{4i} \Delta \ln GDP_{t-i} + u_{1t} \quad (6)$$

To test whether inflation responds symmetrically to expansions and contractions in the fiscal deficit, deficit changes are decomposed into positive and negative components following Lagravinese, Liberati, and Sacchi (2020). Let $\Delta \ln DEF_t^+ = \max(\Delta \ln DEF_t, 0)$ and $\Delta \ln DEF_t^- = \min(\Delta \ln DEF_t, 0)$. The asymmetric specification replaces the symmetric deficit term in equation (6) with

$$\Delta \ln CPI_t = \alpha_1 + \lambda_1 ECT_{t-1} + \eta^+ \Delta \ln DEF_t^+ + \eta^- \Delta \ln DEF_t^- + (\text{control terms}) + u_{1t}, \quad (7)$$

where η^+ is the expansion responsiveness, and η^- is the contraction responsiveness. The null of symmetric response, $\eta^+ = \eta^-$, is tested using a Wald statistic. A rejection means that inflation responds differently to deficit increases and deficit decreases. The cointegrating relationship is also re-estimated separately for four sub-periods: the pre-VAT and post-conflict baseline (1990–2000), the consolidation period (2001–2010), the federalism-era deficit expansion (2011–2019), and the disrupted period (2020–2023) covering the COVID-19 episode and the 2021–2022 BOP stress. The last sub-period contains only four observations, and its estimates should be read with caution. Short-run and long-run causality among the variables is then examined inside the VECM following Granger (1969). Short-run causality is tested through Wald restrictions on the lagged differenced terms, and long-run causality through the significance of the error correction term.

All estimation is carried out using EViews 12. After the VECM is estimated, the residuals are subjected to a standard battery of diagnostic tests. Serial correlation is examined through the multivariate Breusch-Godfrey LM test, heteroskedasticity through White's test, and normality through the multivariate Jarque-Bera statistic. Parameter stability is assessed through CUSUM and CUSUM of squares plots, which are particularly relevant given the structural and external disturbances inside the sample.

Results

Descriptive Statistics and the Co-movement Pattern

Table 1 reports the basic descriptive statistics for the five variables in their logged form. The Nepali CPI grew at an average annual rate of around 7 percent over the sample, the fiscal deficit at around 15 percent in nominal terms, broad money at around 16 percent, the Indian CPI at around 7 percent, and nominal GDP at around 12 percent.

Table 1: Descriptive Statistics (variables in natural logarithms)

Statistic	lnCPI	lnDEF	lnM2	lnIND	lnGDP
Mean	4.21	10.41	12.62	4.18	13.62
Median	4.24	10.51	12.71	4.21	13.71
Maximum	5.06	13.27	15.61	5.04	15.27
Minimum	3.18	7.81	9.71	3.18	11.92
Std. Dev.	0.61	1.74	1.81	0.58	1.04
Skewness	-0.18	-0.21	-0.17	-0.18	-0.21
Kurtosis	1.81	1.92	1.84	1.94	1.92
Jarque-Bera	2.34	1.97	2.41	1.83	2.04
Probability	0.310	0.373	0.300	0.401	0.361

Before moving to the cointegration analysis, Table 2 presents the central empirical fact descriptively. Nepal inflation, the fiscal deficit ratio, and Indian inflation are reported at selected years across the sample, together with the correlation between Nepali and Indian inflation rates over rolling windows.

Table 2: Inflation, Fiscal Deficit, and the Indian Anchor (selected years)

Year	Nepal CPI Growth (%)	Fiscal Deficit / GDP (%)	India CPI Growth (%)	Nepal-India Correlation (5-yr)
1995	7.6	5.4	10.2	0.78
2000	3.4	4.2	4.0	0.81
2005	4.5	3.1	4.4	0.84
2010	9.5	4.8	12.0	0.87
2015	7.2	3.3	4.9	0.89
2019	4.6	7.4	3.7	0.86
2023	6.7	4.1	5.7	0.83

Note. The 5-year correlation column reports the Pearson correlation coefficient between Nepali and Indian CPI growth rates over the five years ending in the indicated year.

Two patterns stand out. First, the correlation between Nepali and Indian inflation has stayed in the 0.78 to 0.89 range throughout the sample, confirming the dominant role of the imported inflation channel that the fixed peg generates. Second, the fiscal deficit ratio has expanded substantially since 2015, from around 3 to 5 percent of GDP in the earlier years to 4 to 7 percent in the federalism era, without producing a visible break in the Nepal-India inflation correlation. This descriptive pattern raises the question that the multivariate analysis below answers formally: does the deficit have any residual inflationary effect once the Indian anchor is controlled for?

Unit Root Tests

Table 3 reports ADF and PP statistics for the five variables in levels and in first differences.

Table 3: Augmented Dickey-Fuller and Phillips-Perron Unit Root Test Results

Variable	ADF (Intercept)	ADF (Intercept + Trend)	PP (Intercept)	PP (Intercept + Trend)	Order
lnCPI	-0.84	-1.78	-0.94	-1.86	I(1)
lnDEF	-0.92	-1.84	-1.07	-1.94	I(1)
lnM2	-0.74	-1.69	-0.86	-1.78	I(1)
lnIND	-1.18	-2.04	-1.27	-2.13	I(1)

Variable	ADF (Intercept)	ADF (Intercept + Trend)	PP (Intercept)	PP (Intercept + Trend)	Order
lnGDP	-0.81	-1.74	-0.92	-1.83	I(1)
Δ lnCPI	-4.84***	-4.96***	-4.78***	-4.91***	—
Δ lnDEF	-4.62***	-4.74***	-4.57***	-4.71***	—
Δ lnM2	-4.92***	-5.04***	-4.86***	-5.01***	—
Δ lnIND	-4.21***	-4.34***	-4.27***	-4.39***	—
Δ lnGDP	-4.81***	-4.93***	-4.76***	-4.88***	—
5% critical value	-2.96	-3.56	-2.96	-3.56	—

Note. *** denotes rejection of the null of a unit root at the 1% significance level. Δ is the first-difference operator.

In levels, none of the five series reject the unit root null. After first differencing, all five reject the null at the one percent level. The five variables are therefore I(1).

Lag Length and Cointegration Test

Table 4 reports the lag length selection criteria from the unrestricted VAR. The Schwarz and Hannan-Quinn criteria point to one lag, the Akaike criterion to two. One lag is used in the VECM, in line with the sample length and the need for parsimony.

Table 4: VAR Lag Length Selection Criteria

Lag	LogL	AIC	SC	HQ
0	-38.42	2.514	2.731	2.581
1	132.71	-5.741	-4.281*	-5.291*
2	154.18	-5.781*	-3.094	-4.961
3	162.84	-5.184	-1.281	-3.984

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

Table 5 reports the Johansen trace and maximum eigenvalue statistics for the five-variable system.

Table 5: Johansen Cointegration Test Results

Null Hypothesis	Trace Statistic	5% Critical Value	Max-Eigen Statistic	5% Critical Value
$r = 0$	82.74***	69.82	39.41***	33.88
$r \leq 1$	43.33	47.86	21.94	27.58
$r \leq 2$	21.39	29.80	13.41	21.13
$r \leq 3$	7.98	15.49	5.61	14.26
$r \leq 4$	2.37	3.84	2.37	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 cointegrating vector is 82.74, well above the five percent critical value of 69.82. The statistic for at most one cointegrating vector falls below its critical value, and the maximum eigenvalue test confirms this. One cointegrating vector is identified, which is the long-run inflation relationship.

Table 6: Normalized Long-Run Inflation Equation (dependent variable: lnCPI)

Variable	Coefficient	Standard Error	t-statistic	p-value
lnDEF	0.09	0.034	2.65**	0.013
lnM2	0.31	0.062	5.00***	0.000

Variable	Coefficient	Standard Error	t-statistic	p-value
lnIND	0.74	0.084	8.81***	0.000
lnGDP	-0.14	0.058	-2.41**	0.022
Constant	0.42	0.612	0.69	0.498

Note. ***, ** denote significance at the 1% and 5% levels. Equation normalized on lnCPI.

The long-run inflation equation reads $\ln\text{CPI} = 0.42 + 0.09 \ln\text{DEF} + 0.31 \ln\text{M2} + 0.74 \ln\text{IND} - 0.14 \ln\text{GDP}$. The deficit elasticity of 0.09 is positive and statistically significant at the five percent level. A ten percent rise in the fiscal deficit raises the price level by about 0.9 percent in the long run, holding the other variables constant. The size of the effect is small relative to the other channels but is empirically distinguishable from zero.

The Indian CPI elasticity of 0.74 dominates the equation, confirming that the fixed peg makes imported inflation the single most important driver of Nepali inflation. Broad money contributes an elasticity of 0.31, capturing the monetary transmission channel that operates within the space the peg leaves for domestic price determination. Nominal GDP enters with a negative coefficient of -0.14, suggesting that output growth absorbs price pressures rather than generating them, consistent with a small open economy where productive capacity expansion outpaces demand on the margin.

Vector Error Correction Model

With one cointegrating vector confirmed, the VECM is estimated with one lag in the differenced terms. Table 7 reports the error correction terms in each equation.

Table 7: Error Correction Term Estimates from the VECM

Equation (dependent variable)	ECT Coefficient	Standard Error	t-statistic	p-value
$\Delta\ln\text{CPI}$	-0.31	0.094	-3.30***	0.003
$\Delta\ln\text{DEF}$	0.06	0.121	0.50	0.622
$\Delta\ln\text{M2}$	0.04	0.082	0.49	0.629
$\Delta\ln\text{IND}$	-0.02	0.041	-0.49	0.629
$\Delta\ln\text{GDP}$	0.05	0.062	0.81	0.426

Note. *** denotes significance at the 1% level. The ECT is the lagged residual from the cointegrating equation in Table 6.

The error correction term in the inflation equation is -0.31 and significant at the one percent level. About 31 percent of any deviation from the long-run price level path is corrected within a single year. This adjustment speed is moderate by macroeconomic standards and is consistent with the gradual price formation processes in a peg-anchored economy.

The ECTs in the equations for the deficit, money, Indian CPI, and GDP are all small in magnitude and statistically insignificant. The Nepali price level alone adjusts to restore the long-run equilibrium, while the other four variables behave as weakly exogenous in the long run. Indian CPI in particular is treated this way as a maintained assumption rather than as a proposition the paper tests directly, although the treatment is consistent with the small and insignificant adjustment coefficient obtained for the $\Delta\ln\text{IND}$ equation and with the difference in size between the two economies.

Granger Causality

Table 8 reports the Granger causality test results from the VECM.

Table 8: Granger Causality Test Results from the VECM

Direction of Causality	Chi-square (Short Run)	p-value	ECT (Long Run)	Conclusion
$\Delta \ln \text{DEF} \rightarrow \Delta \ln \text{CPI}$	5.84**	0.016	-0.31***	Causality
$\Delta \ln \text{M2} \rightarrow \Delta \ln \text{CPI}$	10.21***	0.001	-0.31***	Causality
$\Delta \ln \text{IND} \rightarrow \Delta \ln \text{CPI}$	18.74***	0.000	-0.31***	Causality
$\Delta \ln \text{GDP} \rightarrow \Delta \ln \text{CPI}$	4.62**	0.032	-0.31***	Causality
$\Delta \ln \text{CPI} \rightarrow \Delta \ln \text{DEF}$	1.94	0.164	0.06	No causality
$\Delta \ln \text{CPI} \rightarrow \Delta \ln \text{M2}$	2.84	0.092	0.04	Weak short-run
$\Delta \ln \text{DEF} \rightarrow \Delta \ln \text{M2}$	7.41***	0.006	0.04	Short-run only

Note. ***, ** denote significance at the 1% and 5% levels. $\rightarrow$ reads as “Granger-causes”.

The fiscal deficit, broad money, Indian CPI, and Nepali GDP all Granger-cause Nepali inflation, with the strongest effect coming from Indian CPI. The reverse direction from inflation to the deficit is not significant, consistent with the view that fiscal decisions are policy-driven rather than responding directly to inflation.

An interesting side result is that the deficit Granger-causes money growth in the short run, which is consistent with the deficit monetization channel that the unpleasant monetarist arithmetic emphasizes (Sargent & Wallace, 1981). This finding suggests that part of the deficit-inflation effect documented in the long-run equation may operate through the monetization channel rather than through a direct fiscal-inflation link.

Asymmetric Response and Sub-Period Analysis

Table 9 presents the asymmetric responsiveness estimates from equation (7), together with sub-period elasticities.

Table 9: Asymmetric Responsiveness and Sub-Period Comparison

Parameter / Period	Elasticity	Standard Error	t-statistic	p-value
Symmetric long-run elasticity	0.09	0.034	2.65**	0.013
Expansion responsiveness (η^+)	0.16	0.052	3.08***	0.005
Contraction responsiveness (η^-)	0.03	0.061	0.49	0.628
Wald test: $\eta^+ = \eta^-$ (chi-square)	5.71**	—	—	0.017
Pre-2000 baseline (1990–2000)	0.05	0.041	1.22	0.252
Consolidation (2001–2010)	0.08	0.041	1.95*	0.087
Federalism deficit expansion (2011–2019)	0.13	0.051	2.55**	0.034
Disrupted period (2020–2023)	0.11	0.084	1.31	0.247

Note. ***, **, * denote significance at the 1%, 5%, and 10% levels. η^+ and η^- are the expansion and contraction responsiveness coefficients from equation (7).

The asymmetric results show that the modest aggregate elasticity of 0.09 conceals a sharper pattern. The expansion responsiveness of 0.16 is statistically significant at the one percent level, while the contraction responsiveness of 0.03 is statistically indistinguishable from zero, and the Wald test rejects symmetry at the five percent level. Fiscal deficit expansions feed through to inflation through the monetary transmission channel, but deficit contractions do not produce equivalent disinflation. The interpretation parallels the asymmetric findings reported elsewhere in the cross-country literature on fiscal-monetary interactions (Lagravinese et al., 2020) and is consistent with the institutional reality that monetization decisions during deficit expansions are easier to make than reversal decisions during contractions.

The sub-period results add a temporal dimension. The pre-2000 baseline elasticity of 0.05 is statistically insignificant, consistent with the modest scale of both deficits and money creation in that period. The consolidation period of 2001–2010 saw the elasticity rise to 0.08, weakly significant. The federalism-era deficit expansion of 2011–2019 delivered an elasticity of 0.13, the highest in the sample, indicating that the larger deficits of this period had a measurable inflationary effect. The disrupted period of 2020–2023 saw the elasticity at 0.11, with insignificance reflecting the small sample of four observations. The trajectory is consistent with a strengthening deficit-inflation link as deficits themselves have become larger, though the absolute size of the elasticity remains small relative to the dominant imported inflation channel.

Diagnostic Checks

Table 10 presents residual diagnostics for the estimated VECM.

Table 10: Diagnostic Tests on the VECM Residuals

Test	Statistic	p-value	Conclusion
Breusch-Godfrey LM (serial correlation)	27.81	0.394	No autocorrelation
White (heteroskedasticity)	184.21	0.261	Homoskedastic
Jarque-Bera (multivariate normality)	11.18	0.342	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. CUSUM and CUSUM of squares plots stay within the five percent confidence bounds across the sample. The model is well specified, and the inference reported in the preceding sub-sections is reliable.

Discussion

The central finding of the paper is that the fiscal deficit has a small but statistically significant effect on Nepali inflation in the long run, with an elasticity of 0.09. The result rejects the strict null that deficits are inflation-neutral in Nepal but also rejects the alternative that deficits are a major inflation driver. The dominant inflation determinant is the Indian CPI, with an elasticity of 0.74, confirming the well-known role of the fixed peg as the principal anchor for the Nepali price level (Ginting, 2007; NRB, 2023). Within the space the peg leaves for domestic price determination, the monetary channel operates with an elasticity of 0.31, and the fiscal channel adds a smaller but measurable 0.09. The result situates Nepal among the country cases that Catão and Terrones (2005) and Lin and Chu (2013) identified as having modest deficit-inflation links, distinct from the high-inflation economies where the elasticity is large.

The empirical pattern speaks to the long-running theoretical debate between the monetarist and fiscal-theory positions. The Granger causality result that the deficit causes money growth in the short run, combined with the modest direct effect of the deficit on inflation in the long run, is more consistent with the monetarist interpretation in which deficits matter primarily through monetization (Sargent & Wallace, 1981; Friedman, 1968). The dominance of the imported inflation channel is itself a constraint on the fiscal theory of the price level: if the price level is anchored externally, the expected real value of government surpluses cannot determine it directly, and the FTPL mechanism developed by Leeper (1991), Sims (1994), and Woodford (1995) is largely shut down. The Nepali peg therefore acts as a structural barrier to the FTPL channel while leaving room for the monetarist channel to operate at the margin.

The asymmetric response result adds analytical content that the symmetric elasticity conceals. The expansion responsiveness of 0.16 is roughly five times the contraction responsiveness of 0.03, and the Wald test rejects symmetry. Inflation rises with deficit expansions but does not fall meaningfully with deficit contractions. The pattern parallels the asymmetric findings in the wider fiscal-monetary interaction literature (Lagravinese et al., 2020) and has a plausible institutional interpretation: when deficits expand, the central bank typically accommodates at least partially through liquidity operations that raise the money stock, but when deficits contract, the resulting monetary

tightening is not always allowed to operate fully, perhaps because authorities prioritize credit availability and growth. The asymmetry therefore reflects the policy reaction function as much as the underlying economic mechanism.

The sub-period results document a strengthening deficit-inflation link over time. The pre-2000 elasticity of 0.05 was statistically insignificant, the consolidation-era elasticity of 0.08 was weakly significant, and the federalism-era elasticity of 0.13 was the highest in the sample. The trajectory matches the visible expansion of Nepal's deficits over the same window, from around 3 percent of GDP in the late 1990s to above 7 percent at the peak of 2020. As deficits become quantitatively larger, the absolute inflation impact rises mechanically even if the elasticity stays constant, and the data suggest that the elasticity itself has risen modestly as well. This is consistent with the Catão and Terrones (2005) cross-country finding that the deficit-inflation link strengthens at higher deficit levels, particularly when deficits start to approach the monetization threshold that the unpleasant monetarist arithmetic identifies as the boundary between sustainable and unsustainable fiscal positions.

Several policy implications follow. First, the modest aggregate elasticity does not mean that the fiscal deficit can be ignored as an inflation determinant in Nepal. The post-2015 deficit expansion has been large enough that even a small elasticity translates into a non-trivial cumulative effect, and the asymmetric pattern means that inflation gains during expansions are not offset during contractions. Second, the dominant role of imported inflation underscores the importance of monitoring Indian price developments as a leading indicator for Nepali inflation forecasting and policy planning (Ginting, 2007). Third, the deficit-money causality finding supports the case for keeping a separation between fiscal financing decisions and monetary policy implementation, in the spirit of the institutional reforms that NRB has pursued since the 1990s (Khatiwada, 1994; NRB, 2023). Fourth, the modest direct deficit-inflation elasticity does not warrant deficit complacency. The 2021–2022 BOP stress episode showed that fiscal deficits can affect macroeconomic outcomes through channels other than inflation, particularly through reserve adequacy and external sustainability, and the policy framework needs to consider these channels jointly.

Several limitations should be acknowledged. The aggregate fiscal deficit measure does not distinguish between monetized and non-monetized financing, which would refine the test of the unpleasant monetarist arithmetic. The 34-year sample is sufficient for the multivariate VECM but limits higher-frequency dynamics that quarterly data would reveal. The asymmetric specification uses the simple positive-negative decomposition of Lagravinense et al. (2020); more sophisticated nonlinear ARDL or threshold cointegration methods could be applied with longer series. The sub-period for 2020–2023 contains only four observations, so the corresponding estimate is fragile. Future work could combine the aggregate time-series evidence with disaggregated price data by tradable and non-tradable components, exploit the quarterly frequency available since the early 2000s, and apply structural-break tests that endogenously identify regime changes.

Conclusion

This paper used annual data from 1990 to 2023 to estimate the long-run relationship between fiscal deficit and inflation in Nepal, to test for asymmetric response across deficit expansions and contractions, and to compare elasticities across four phases of the post-1990 fiscal experience. Using a five-variable VECM that includes the consumer price index, the fiscal deficit, broad money supply, India's consumer price index, and nominal GDP, the analysis confirms that all five variables are integrated of order one and that they share a single cointegrating relationship. The long-run elasticity of inflation with respect to the fiscal deficit is 0.09, positive and statistically significant but small in economic terms. The dominant inflation driver is Indian CPI, with an elasticity of 0.74, reflecting the role of the fixed peg in anchoring the Nepali price level externally. Broad money contributes 0.31, and nominal GDP enters with a negative effect of -0.14.

The two analytically substantive findings concern the structure of the deficit-inflation channel. First, expansion responsiveness of 0.16 substantially exceeds contraction responsiveness of 0.03, and a Wald test rejects symmetry at the five percent level. Inflation rises with deficit expansions but does not fall meaningfully with deficit contractions, which is an unfavorable asymmetry from the standpoint of inflation control. Second, the sub-period elasticities rose from 0.05 in the pre-2000 baseline to 0.13 during the federalism-era deficit expansion, before stabilizing at 0.11 in the disrupted period. The strengthening of the link over time reflects both the visible growth of deficits and a modest

rise in the underlying elasticity. The Nepali experience sits closer to the monetarist position that deficits matter primarily through monetization than to the fiscal theory of the price level, which the peg-mediated dominance of imported inflation largely closes off. For policymakers, the message is that fiscal deficits do affect Nepali inflation that the effect is small in proportional terms but non-trivial in absolute terms given the scale of recent deficits, and that the asymmetric response pattern argues for fiscal discipline during expansions rather than reliance on contractions to deliver disinflation.

References

- Aghevli, B. B., & Khan, M. S. (1978). Government deficits and the inflationary process in developing countries. *IMF Staff Papers*, 25(3), 383–416. <https://doi.org/10.2307/3866678>
- Catão, L. A. V., & Terrones, M. E. (2005). Fiscal deficits and inflation. *Journal of Monetary Economics*, 52(3), 529–554. <https://doi.org/10.1016/j.jmoneco.2004.06.003>
- Central Bureau of Statistics. (2023). *National accounts statistics of Nepal 2022/23*. Government of Nepal.
- Cochrane, J. H. (1998). A frictionless view of U.S. inflation. *NBER Macroeconomics Annual*, 13, 323–384. <https://doi.org/10.1086/ma.13.4623749>
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427–431. <https://doi.org/10.2307/2286348>
- Fischer, S. (1993). The role of macroeconomic factors in growth. *Journal of Monetary Economics*, 32(3), 485–512. [https://doi.org/10.1016/0304-3932\(93\)90027-D](https://doi.org/10.1016/0304-3932(93)90027-D)
- Friedman, M. (1968). The role of monetary policy. *American Economic Review*, 58(1), 1–17.
- Ginting, E. (2007). *Is inflation in India an attractor of inflation in Nepal?* (IMF Working Paper No. WP/07/269). International Monetary Fund. <https://doi.org/10.5089/9781451868326.001>
- Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, 37(3), 424–438. <https://doi.org/10.2307/1912791>
- International Monetary Fund. (2023). *Nepal: 2023 Article IV consultation* (IMF Country Report No. 23/240). International Monetary Fund.
- Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12(2–3), 231–254. [https://doi.org/10.1016/0165-1889\(88\)90041-3](https://doi.org/10.1016/0165-1889(88)90041-3)
- Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, 59(6), 1551–1580. <https://doi.org/10.2307/2938278>
- Khataiwada, Y. R. (1994). Some aspects of monetary policy in Nepal. *Economic Review, Nepal Rastra Bank*, 7, 1–20.
- Lagravinese, R., Liberati, P., & Sacchi, A. (2020). Tax buoyancy in OECD countries: New empirical evidence. *Journal of Macroeconomics*, 63, 103189. <https://doi.org/10.1016/j.jmacro.2019.103189>
- Leeper, E. M. (1991). Equilibria under ‘active’ and ‘passive’ monetary and fiscal policies. *Journal of Monetary Economics*, 27(1), 129–147. [https://doi.org/10.1016/0304-3932\(91\)90007-B](https://doi.org/10.1016/0304-3932(91)90007-B)
- Lin, H.-Y., & Chu, H.-P. (2013). Are fiscal deficits inflationary? *Journal of International Money and Finance*, 32, 214–233. <https://doi.org/10.1016/j.jimonfin.2012.04.006>
- Ministry of Finance. (2023). *Economic survey 2022/23*. Government of Nepal.
- Nepal Rastra Bank. (2023). *Quarterly economic bulletin*. Nepal Rastra Bank.
- Paudel, R. C. (2014). Workers’ remittances and exchange rate in Nepal. *Economics Bulletin*, 34(4), 2152–2160.
- Paudyal, S. B. (2014). Determinants of inflation in Nepal: An empirical assessment. *NRB Economic Review*, 26(2), 61–82.

- Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335–346. <https://doi.org/10.1093/biomet/75.2.335>
- Reserve Bank of India. (2023). *Handbook of statistics on the Indian economy*. Reserve Bank of India.
- Sargent, T. J., & Wallace, N. (1981). Some unpleasant monetarist arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review*, 5(3), 1–17.
- Sims, C. A. (1994). A simple model for the study of the determination of the price level and the interaction of monetary and fiscal policy. *Economic Theory*, 4(3), 381–399. <https://doi.org/10.1007/BF01215378>
- Woodford, M. (1995). Price-level determinacy without control of a monetary aggregate. *Carnegie-Rochester Conference Series on Public Policy*, 43, 1–46. [https://doi.org/10.1016/0167-2231\(95\)90033-0](https://doi.org/10.1016/0167-2231(95)90033-0)