THE ECONOMIC JOURNAL OF NEPAL, Vol. 47, No. 3 & 4, July-December, 2024 (Issue No. 162) © CEDECON-TU
DOI: https://doi.org/10.3126/ejon.v47i3-4.88848

Money Supply and Economic Growth in Nepal: Empirical Evidence from 1975–2022

Bhawana Basnet[1], Ram Prasad Gyanwaly[2]

Abstract

This study investigates the relationship between money supply and economic growth in Nepal from 1975 to 2022. While monetary policy is widely recognized as an important policy lever for economic development, the specific mechanisms by which the money supply influences growth remain poorly understood in Nepal's context, particularly regarding how different monetary aggregates affect real economic activity and the behavioral constraints on monetary policy. This study examines the long- and short-run relationships between various measures of the money supply and economic growth using secondary time-series data from the Nepal Rastra Bank and the Central Bureau of Statistics. The analysis employs accounting and money multiplier approaches to examine money creation process, supplemented by econometric techniques such as unit root tests, cointegration analysis, vector error correction models. The study reveals significant positive long-run relationships between real money supply and real GDP growth, with elasticities of 0.28 for narrow money (M1) and 0.27 for broad money (M2). Broad money adjusts more rapidly to equilibrium than narrow money, indicating differential speeds of adjustment in Nepal's monetary system. However, the money multiplier analysis shows that behavioral factors, such as currency leakage and financial intermediation patterns, substantially constrain the central bank's ability to control the money supply precisely with conventional policy tools. These findings indicate that monetary policy can meaningfully influence economic growth in Nepal. However, its effectiveness depends on understanding the specific transmission channels and addressing broader financial development issues, particularly financial inclusion and reducing currency leakage from the banking system.

Keywords: Money supply, Economic growth, Cointegration, Nepal, Monetary policy
JEL Classification: E51, E52, O40, C3

1 **Ms. Basnet** (Corresponding author) is a Lecturer at Premier College, Tribhuvan University. Email: basnetbhawana55@gmail.com, ORCID ID: https://orcid.org/0009-0006-7033-7890

2 **Dr. Gyanwaly** is a Professor at the Central Department of Economics, Tribhuvan University. Email: ram.gyanwaly@cdec.tu.edu.np. ORCID ID: https://orcid.org/0009-0006-3100-1999

Introduction

The relationship between the money supply and economic growth is a central concern in macroeconomic policy, particularly for developing economies that must achieve stable growth while maintaining price stability. Understanding how monetary policy influences growth requires examining both theoretical frameworks and empirical evidence specific to different economic contexts.

Theoretical debates on monetary policy have evolved considerably over several decades. The monetarist school, exemplified by the quantity theory of money, emphasizes that changes in money supply primarily drive inflation rather than real output growth. However, this perspective has been contested, particularly following the global financial crisis, which revealed how monetary policy decisions can produce severe economic consequences across both developed and developing economies. An alternative suggests that expanding the money supply increases liquidity and creates investment opportunities, thereby facilitating economic growth through improved financial intermediation. These competing perspectives highlight that the relationship between money supply and growth is neither straightforward nor universally settled.

The mechanisms through which money supply affects economic growth operate through several channels. When financial intermediation improves in quality and efficiency, it can expand credit availability and support productive investment.

Nepal presents a particularly relevant case for investigating these relationships. Since the mid-1970s, Nepal's economy has undergone significant structural changes accompanied by varying monetary policy approaches implemented by Nepal Rastra Bank. Nepal's financial system exhibits distinctive characteristics shaped by its stage of economic development, banking practices, and economic structure. Despite extensive economic transformation and shifting monetary policies, prior research has not adequately examined how different monetary aggregates influence real economic activity in Nepal and how behavioral patterns affect the money supply process.

The research problem addressed by this study is twofold. First, while existing studies have examined money supply-growth relationships in various developing countries, Nepal-specific research remains limited in scope, typically covering shorter periods and employing simplified methodologies. Second, the money supply generated through the money multiplier process has not been thoroughly investigated. This study aims to fill these gaps by providing a comprehensive 47-year analysis that illuminates both the dynamics of the money supply generation and the money-growth relationship.

This study investigates the relationship between money supply and GDP growth in Nepal from 1975 to 2022. Specifically, it analyzes trends and structural patterns in Nepal's money supply, examines both short-run and long-run relationships between different measures of the money supply and growth. The analysis employs accounting and money multiplier approaches to understand the processes of money creation, supplemented by econometric techniques. It is in this background that this research has raised the following two questions. How is the money supply generated in Nepal? How is the money supply affecting the economic growth in Nepal?

The significance of this research lies in establishing evidence of the money supply-growth relationship specific to Nepal's developing economic context. By employing rigorous econometric methods on an extended time series, the study clarifies whether monetary policy can effectively influence real economic growth in Nepal and identifies the specific channels through which effects operate. Understanding these relationships has direct policy relevance for Nepal Rastra Bank in designing effective monetary policies that support sustainable economic growth while maintaining price stability. Furthermore, the findings contribute to broader literature on monetary economics in developing countries by providing empirical evidence from a small, landlocked economy with unique institutional features and external dependencies.

This paper is organized as follows. Section 2 reviews relevant literature on money supply-growth relationships and identifies specific research gaps. Section 3 describes the data sources and analytical methods employed, including the econometric framework and diagnostic procedures. Section 4 presents the empirical findings from money supply process analysis and cointegration results. Section 5 concludes with policy implications and suggestions for future research.

Literature Review

The relationship between money supply and economic growth has been examined through competing theoretical frameworks that offer different insights into monetary transmission mechanisms. The Quantity Theory of Money, pioneered by Fisher (1911) and later refined by Friedman (1956), establishes a fundamental link between the stock of money and nominal income. This theory proposes that in the long run, changes in money supply primarily affect price levels rather than real output, suggesting the neutrality of money. Friedman's version of monetarism acknowledges that monetary policy can influence real output in the short term through adjustments in economic behavior and expectations.

In contrast, Keynesian theory emphasizes that the money supply affects economic activity through an indirect mechanism that involves interest rates, investment, and aggregate demand. According to Keynes (1936), an increase in the money supply reduces interest rates, thereby stimulating investment and consumption expenditures, enhancing aggregate demand and economic growth. Notably, the Keynesian framework recognizes that short-run price rigidities allow monetary policy to produce real effects on output and employment. The Keynesian transmission mechanism particularly highlights the importance of financial intermediaries in channeling savings into productive investment, with monetary policy creating conditions conducive to growth through financial deepening.

Endogenous growth theory, developed by Romer (1986) and Lucas (1988), extends this analysis by incorporating financial development as an endogenous factor in growth processes. This approach emphasizes that financial development, including an expanded money supply and improved financial intermediation, can sustain long-term growth by enhancing capital accumulation, technological innovation, and productivity improvements. The theory suggests that as financial systems develop and money supply expands, economies can achieve persistent increases in growth rates rather than merely temporary increases in output.

Modern Monetary Theory (MMT), emerging more recently from scholars such as Mosler (2012) and Kelton (2020), offers a distinct perspective on the money supply and economic growth in fiat-currency economies. MMT argues that governments with sovereign currency issuance capabilities can create money to finance spending without the constraints that limit households or firms. This framework challenges traditional concerns that money supply growth leads to inflation, suggesting instead that inflation arises when resource constraints bind. MMT emphasizes the role of full employment and productive capacity utilization rather than monetary aggregates alone as determinants of inflation, potentially widening the space for expansionary monetary policy to achieve growth objectives. However, MMT's applicability to developing economies like Nepal, which lack full currency sovereignty due to external dependencies and fixed or managed exchange rate regimes, remains contested.

Empirical studies examining the money supply-growth nexus have produced varied results across different economies and time periods, reflecting the context-specific nature of monetary relationships. Ogunmuyiwa and Ekone (2010) found a positive relationship between money supply and economic growth in Nigeria, with broad money supply (M2) showing a stronger correlation with GDP than narrow money (M1). Similarly, Ihsan and Anjum (2013) reported a significant

positive impact of the money supply on Pakistan's GDP, emphasizing the role of financial intermediation in facilitating economic activity. In a comprehensive analysis across 71 countries, Levine et al. (2000) established a robust positive correlation between financial intermediary development and economic growth, suggesting that an expanded money supply enhances growth by improving resource allocation. This finding was supported by Beck et al. (2014), who demonstrated that financial deepening positively impacts economic growth in developing countries, particularly through increased credit availability to the private sector.

However, other studies have questioned the direct causal link between the money supply and economic growth. Akinlo (2007) found a weak relationship between the money supply and output growth in Nigeria, suggesting that institutional and governance quality play a more dominant role than monetary factors alone. Similarly, Maysami and Koh (2000) observed that the money supply-growth relationship in Singapore depended heavily on exchange rate regimes and international capital flows. The direction of causality has emerged as a particularly contentious issue. While Hussain and Haque (2017) found unidirectional causality from money supply to economic growth in Bangladesh, Ogunmuyiwa and Ekone (2010) identified bidirectional causality in Nigeria. Gyanwaly (2012) found that the money supply is causing price and output in Asian countries, with some feedback effects. These divergent findings highlight how the relationship between the money supply and growth varies significantly across financial market development, economic structures, and institutional frameworks.

Research specifically addressing Nepal's monetary dynamics and economic growth remains limited in scope and coverage. Khatiwada (2005) examined the effectiveness of monetary policy in Nepal, finding that the money supply had significant but delayed effects on economic growth. This study attributed weak transmission mechanisms to underdeveloped financial markets and structural rigidities in Nepal's economy. Bhatta (2011) investigated the relationship between financial development and economic growth in Nepal, reporting a positive correlation between broad money supply (M2) as a percentage of GDP and economic growth rates. However, this research highlighted institutional weaknesses in Nepal's financial sector that constrained the effective transmission of monetary policy. More recently, Poudel (2018) analyzed how monetary policy shocks affected Nepal's macroeconomic variables, finding that changes in the money supply had significant effects on output and inflation across different lag periods. This study emphasized the importance of coordinated fiscal and monetary policies for achieving sustainable growth.

Despite these contributions, important research gaps remain. Most existing studies on Nepal examine relatively short time periods, failing to capture long-term relationships and structural transformations that have characterized Nepal's economy since the mid-1970s. Previous research frequently employed simplified models that did not adequately account for long-run changes in the Nepalese economy. The specific transmission channels through which money supply influences economic growth in Nepal remain inadequately understood, with limited investigation into how different mechanisms operate within Nepal's unique economic context.

This study addresses these gaps by analyzing a comprehensive 47-year dataset (1975-2022) that encompasses major policy shifts and structural changes in Nepal's economy. The research employs robust econometric methods, including unit root tests, cointegration analysis, and vector error-correction models, to establish both short- and long-run relationships. By examining money creation through both accounting and money multiplier frameworks, the study provides a comprehensive understanding of Nepal's monetary dynamics and their implications for economic development policy. The inclusion of inflation as a control variable addresses omitted-variable bias concerns, while deflating monetary aggregates to real terms addresses scale-mismatch issues.

Data and Methods

This study employs a quantitative approach, incorporating both descriptive and inferential research designs, to examine the relationship between the money supply and economic growth in Nepal over the period 1975 to 2022. The research design is causal, aiming to establish how the money supply influences economic growth while accounting for other relevant determinants.

The theoretical framework draws on the Quantity Theory of Money and Keynesian transmission mechanisms to motivate the empirical specification. Rather than treating the monetary identity MV = PY as a behavioral model, this study recognizes it as an accounting framework, highlighting that changes in money supply can influence nominal output through velocity adjustments and behavioral responses. In the short run, Keynesian theory suggests that increases in money supply reduce interest rates, expand credit availability, and stimulate investment and consumption, thereby supporting real economic growth. Money's effects on the economy depend on how velocity responds to monetary changes and how financial institutions transmit monetary impulses to the real economy. The analysis acknowledges that velocity may vary over time in response to financial innovation and changing economic circumstances, rather

than assuming constant velocity. The theoretical approach thus emphasizes that money supply affects growth through multiple channels, including credit expansion, interest rate adjustments, and capital formation, while recognizing that growth in real income also generates demand for money, creating potential feedback mechanisms.

The study uses secondary annual time-series data from 1975 to 2022, 47 years chosen to capture major structural transformations and policy shifts in Nepal's economy while maintaining data consistency. The unit of observation is national-level annual economic indicators. Data were obtained from official sources, including publications of Nepal Rastra Bank, the Central Bureau of Statistics, and the Ministry of Finance. Data quality was ensured through triangulation across multiple official sources, with discrepancies resolved by reference to primary statistical bulletins and institutional reports. This approach was particularly important for earlier years, when reporting standards varied.

The variables included are Real Gross Domestic Product (RGDP) in constant prices, Narrow Money Supply (M1), Broad Money Supply (M2), Gross Fixed Capital Formation (GFCF), Exports, and Consumer Price Index inflation (CPI). RGDP in constant 2010/11 prices serve as the dependent variable representing real economic output. M1 comprises currency in circulation plus demand deposits, while M2 includes M1 plus savings and time deposits. To address the theoretical requirement that money supply effects be examined in real terms, both M1 and M2 were deflated using the GDP deflator to create real monetary aggregates (RM1 and RM2) for the primary analysis. This deflation ensures consistency between the real GDP-dependent variable and the real monetary aggregate-independent variables, eliminating scale mismatch and the possibility of spurious correlation. RGFCF represents real capital accumulation, a key determinant of growth, while real exports capture the external sector's contribution to growth. The Consumer Price Index accounts for price dynamics emphasized in monetary theory and addresses concerns about omitted-variable bias. All variables were transformed into logarithmic form to facilitate the interpretation of coefficients as elasticities and to promote linearity in relationships.

The empirical model specifies real GDP as a function of real money supply measures, capital formation, exports, and inflation:

LRGDP = f(LRM1, LRM2, LRGFCF, LRExports, LCPI)……..(1)

The expected relationships are positive for money supply, capital, and exports. The relationship between inflation and real economic activity may be negative

if inflation reduces real economic activity through increased uncertainty, or positive in the short run if inflation reflects demand-driven expansion.

The analytical approach follows a systematic methodology for time series analysis. First, Augmented Dickey-Fuller tests assess the stationarity of all variables, both with and without trend terms, to identify unit roots and integration orders. Given the long dataset span from 1975 to 2022, which encompasses Nepal's economic liberalization in 1990, the Maoist insurgency period (1996-2006), the global financial crisis (2007-2009), and the COVID-19 pandemic (2020-2022).

The co-integrating relationship is examined using Engle-Granger's two-step procedure. Lag length selection for VECM is determined using the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Hannan-Quinn Information Criterion (HQIC). All three criteria are reported, and when they differ, the criterion that suggests the most parsimonious model is employed. This transparent approach ensures that results are not driven by arbitrary lag selection.

First, the model is examined for a co-integrating relation using Engle-Granger's two-step procedure, and then the ECM is estimated. For cointegrated systems, a Vector Error Correction Model is estimated to capture both short-term dynamics and long-term equilibrium adjustments. The VECM specification is:

$$\Delta Y_t = \alpha + \Sigma\beta_i \Delta Y_{t-i} + \Sigma\gamma_i \Delta X_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \ldots\ldots\ldots (2)$$

Where ΔYt is the first difference of the dependent variable, ΔXt-i represents lagged differences of explanatory variables, ECTt-1 is the error correction term derived from the long-run cointegrating relationship, and λ measures the speed of adjustment towards long-run equilibrium.

Following VECM estimation, comprehensive diagnostic tests are conducted to validate model robustness. Tests for serial correlation employ the Breusch-Godfrey test, heteroscedasticity is tested using White's test, normality of residuals is assessed using the Jarque-Bera test, and model stability is evaluated using the CUSUM and CUSUMSQ tests. These diagnostics ensure the reliability of model estimates and their compliance with econometric assumptions.

A money multiplier analysis examines the structural factors that influence money creation in Nepal's banking system. The money multiplier links the monetary base to broader monetary aggregates through the relationship: M2 = m × MB, where m is the money multiplier and MB is the monetary base. The money multiplier can be decomposed as:

$$m = (1 + c) / (c + r + e) \ldots\ldots (3)$$

where c is the currency ratio (currency held by public relative to deposits), r is the required reserve ratio (reserve requirement set by central bank), and e is the excess reserve ratio (excess reserves held by banks relative to deposits). This decomposition reveals how behavioral factors (currency preferences, excess reserve holding), reserve requirements, and financial intermediation patterns constrain or facilitate money creation in Nepal's economy. The money multiplier analysis employs OLS estimation on first-differenced data with lagged dependent variables to examine how changes in each component influence the overall multiplier.

Sensitivity analysis is conducted by varying lag lengths within the determined optimal range, testing alternative variable specifications, including separate models for M1 and M2, and re-estimating models across different subperiods to ensure robustness of the findings. This comprehensive approach establishes both short-term and long-term relationships between money supply and economic growth while accounting for structural breaks, diagnostic validity, and the complexity of Nepal's monetary transmission mechanisms.

Results and Discussion

Money Supply Process in Nepal

This section presents findings on the money supply process in Nepal using two complementary analytical approaches: the accounting approach and the money multiplier framework. Understanding the mechanisms through which money supply is created and controlled is essential for effective monetary policy implementation and the achievement of macroeconomic objectives.

The accounting approach provides a balance sheet perspective on monetary aggregates. Using data for the fiscal year 2021/22, the relationship between the source and use sides of Nepal's monetary base reveals the composition of the money supply. Net foreign assets (NFA) totaled Rs. 1,112,363.6 million, calculated as the difference between foreign assets of Rs. 1,304,086.8 million and foreign liabilities of Rs. 191,723.2 million. Net domestic assets (NDA) amounted to Rs. 4,393,037.2 million, comprising net domestic credit of Rs. 5,671,677.1 million, less capital and other items of Rs. 1,278,639.9 million. On the uses side, broad money supply (M2) reached Rs. 5,505,400.8 million, composed of narrow money (M1) of Rs. 948,113.4 million and time deposits of Rs. 4,557,287.4 million. This balance sheet framework demonstrates that

monetary aggregates reflect the combined effects of external sector dynamics and domestic credit creation.

To examine the determinants of money creation, we employed the money multiplier framework. The money multiplier decomposition reveals how behavioral factors and policy instruments influence the money creation process. Before analysis, Augmented Dickey-Fuller tests confirmed that all variables in the money multiplier equations were non-stationary at levels but stationary after first differencing, necessitating estimation in first differences.

Table 1: OLS Results for M2 Money Multiplier

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLCRATIO	-0.3826	0.0382	-9.992	0.0000***
DLDRATIO	-0.0385	0.0089	-4.331	0.0001**
DLERATIO	-0.0585	0.0277	-2.114	0.0406**
DLRRATIO	-0.2326	0.0116	-19.962	0.0000***
DLTRATIO	0.3869	0.0354	10.930	0.0000***
C	0.0009	0.0029	0.334	0.7405
R-squared	0.952364		F-Statistic	163.9386***
Adjusted R-squared	0.946551		D-W Statistic	1.8044

*. ***, *, * denote significance at 1%, 5%, and 10% levels, respectively.*

The OLS results for the M2 money multiplier demonstrate substantial explanatory power, with an R-squared of 0.952 and an adjusted R-squared of 0.947, indicating that the included variables explain approximately 95% of the variation in the M2 multiplier. The F-statistic of 163.94 is significant at the 1% level, confirming the joint significance of all explanatory variables. The Durbin-Watson statistic of 1.804 indicates the absence of first-order autocorrelation.

All explanatory variables exhibit statistically significant relationships with theoretically consistent signs. The currency ratio (DLCRATIO) has a coefficient of -0.383 ($p < 0.01$), indicating a negative relationship with the M2 money multiplier. This result reflects monetary theory, as higher currency holdings relative to deposits represent leakage from the credit creation process, constraining money supply expansion. The deposit ratio (DLDRATIO) demonstrates a negative coefficient of -0.039 ($p < 0.01$), while the excess reserve ratio (DLERATIO) exhibits a coefficient of -0.059 ($p < 0.05$). The required reserve ratio (DLRRATIO) displays a substantial negative impact with a coefficient of -0.233 ($p < 0.01$), confirming the effectiveness of reserve requirements as a monetary policy instrument.

Notably, the time deposit ratio (DLTRATIO) exhibits a positive coefficient of 0.387 ($p < 0.01$), indicating that shifts toward time deposits enhance the money multiplier and broad money supply. This positive relationship arises from lower reserve requirements for time deposits than for demand deposits, thereby permitting greater credit expansion. These findings reveal that while reserve requirements significantly influence the money multiplier, behavioral factors beyond the central bank's direct control, including currency-holding preferences, time deposit ratios, and excess reserve decisions, substantially determine the money supply process. This suggests that Nepal Rastra Bank's ability to control the money supply through reserve requirement adjustments alone is constrained by endogenous behavioral factors and financial intermediary decisions.

Long-Run Relationships Between Money Supply and Economic Growth

To investigate the equilibrium relationship between money supply and economic growth, we first conducted Augmented Dickey-Fuller tests on all variables. Results indicated non-stationarity at levels, with stationarity after first differencing, confirming integration of order one (I(1)) for all series. Zivot-Andrews structural break tests revealed potential breaks around 1990 (liberalization), 2000 (mid-insurgency), and 2009 (financial crisis), but these breaks did not alter the conclusions regarding the integration order.

Table 2: OLS Results for Long-Run Relationship (Dependent Variable LRGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRGFCF	0.5612	0.0808	6.9376	0.0000***
LRM1	0.2800	0.0910	3.0749	0.0036***
LREXPORT	0.0653	0.0243	2.6875	0.0101**
LCPI	-0.0421	0.0185	-2.272	0.0289**
C	5.1502	0.3393	15.1773	0.0000***
Adjusted R-squared	0.956		F-Statistic	246.78***

*. ***, *, * denote significance at 1%, 5%, and 10% levels respectively.*

The results in Table 2 present OLS estimates for a model that includes real narrow money (RM1), real gross fixed capital formation (RGFCF), exports, and the consumer price index (CPI) as determinants of real GDP. All variables demonstrate statistically significant relationships with real GDP. Gross fixed capital formation exhibits a coefficient of 0.561 ($p < 0.01$), indicating that a 1% increase in RGFCF corresponds to a 0.56% increase in real GDP. Real narrow money (RM1) demonstrates a coefficient of 0.280 ($p < 0.01$), implying that a 1% increase in RM1 is associated with a 0.28% increase in real GDP. Exports

show a positive but smaller impact with a coefficient of 0.065 ($p < 0.05$). The CPI exhibits a negative coefficient of -0.042 ($p < 0.05$), indicating that higher consumer prices are associated with lower real GDP, suggesting that inflation reduces real economic activity through increased uncertainty and reduced investment.

Table 3: E-G Cointegration Test Results

Test	t-Statistic
Augmented Dickey-Fuller test statistic	-4.478755*

**denotes significance at 10% level. Test conducted on residuals from long-run regression.*

To confirm the presence of cointegration, the residuals from this regression are tested for stationarity using the Augmented Dickey-Fuller test. The computed test statistic of -4.479 is greater than the critical value of -4.348 of the Engle-Granger co-integration tests at the 10% significance level. It confirms to a long-run equilibrium relationship between real GDP and the real narrow money supply, along with the control variables.

Table 4: OLS Results for the Long-Run Relationship Between Real GDP and RM2 (Dependent Variable LRGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRGFCF	0.5060	0.0837	6.0451	0.0000***
LRM2	0.2710	0.0745	3.6346	0.0007***
LREXPORT	0.0871	0.0198	4.3833	0.0001***
LCPI	-0.0384	0.0162	-2.3660	0.0224**
C	4.3798	0.4968	8.8144	0.0000***
Adjusted R-squared	0.952		F-Statistic	218.45***

*. ***, **, * denote significance at 1%, 5%, and 10% levels respectively.*

Table 4 reports OLS results for the model using real broad money (RM2). Gross fixed capital formation exhibits a coefficient of 0.506 ($p < 0.01$). At the same time, real broad money demonstrates a coefficient of 0.271 ($p < 0.01$), indicating that a 1% increase in RM2 is associated with a 0.27% increase in real GDP. Exports show a coefficient of 0.087 ($p < 0.01$), while CPI exhibits a negative coefficient of -0.038 ($p < 0.05$).

To confirm the presence of cointegration, the residuals from this regression are tested for stationarity using the Augmented Dickey-Fuller test. The computed test statistic of -4.8948 is greater than the critical value of -4.700 of the Engle-Granger co-integration test at the 5% level of significance. It confirms a long-run equilibrium relationship between real GDP and the real broad money supply,

along with the control variables. These results establish that both real narrow and real broad money measures share long-run equilibrium relationships with real GDP, with elasticities of approximately 0.28 and 0.27, respectively.

Table 5: EG Cointegration Test Results

Test	t-Statistic
Augmented Dickey-Fuller test statistic	-4.8948**

***denotes significance at 5% level. Test conducted on residuals from long-run regression.*

Short-Run Dynamics and Adjustment Mechanisms

The presence of cointegration justified the estimation of Vector Error Correction Models to capture the short-run dynamics and the speed of adjustment toward equilibrium. Lag length was determined using AIC, BIC, and HQIC, with all three suggesting a lag length of 1 for this analysis.

Table 6: Error Correction Model for RM1 (Dependent Variable DLRGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLRGFCF(-1)	0.3165	0.0939	3.3685	0.0017***
DLRM1(-1)	0.3082	0.1679	1.8350	0.0739*
DLEXPORT	0.1333	0.0440	3.0243	0.0043***
DLREXPORT(-1)	-0.0467	0.0431	-1.0813	0.2860
DLCPI	-0.0185	0.0112	-1.647	0.1091
ECT(-1)	-0.2418	0.1387	-1.7432	0.0890*
C	0.0235	0.0315	0.7472	0.4593

****, **, * denote significance at 1%, 5%, and 10% levels respectively.*

Table 6 presents ECM results for the real M1 model. The error correction term ECT (-1)) has a coefficient of -0.242 ($p < 0.10$), confirming the long-run relationship and indicating that approximately 24.2% of any deviation from equilibrium is corrected annually. This adjustment speed suggests gradual convergence to equilibrium, implying that monetary transmission in Nepal's economy takes considerable time. The short-run dynamics reveal that lagged RGFCF growth exhibits a coefficient of 0.317 ($p < 0.01$), while lagged RM1 growth shows a coefficient of 0.308 ($p < 0.10$), indicating positive short-run effects on GDP growth. Current-period export growth demonstrates a coefficient of 0.133 ($p < 0.01$), while CPI effects are not statistically significant in the short run.

Table 7: Error Correction Model Results for RM2 (Dependent Variable DLRGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLRGFCF(-1)	0.2579	0.0953	2.7050	0.0099***
DLRM2	0.0514	0.1541	0.3337	0.7403
DLREXPORT	0.1161	0.0438	2.6505	0.0114**
DLCPI	-0.0152	0.0098	-1.550	0.1301
ECT(-1)	-0.3584	0.1488	-2.4075	0.0206**
C	0.0642	0.0276	2.3266	0.0250**

***, **, * *denote significance at 1%, 5%, and 10% levels respectively.*

Table 7 presents ECM results for the real M2 model. The error correction term exhibits a coefficient of -0.358 ($p < 0.05$), indicating stronger adjustment than the RM1 model, with approximately 35.8% of deviations corrected annually. This faster adjustment reflects that broad money, including time deposits, responds more quickly to interest rate changes and equilibrium pressures than narrow money. Lagged RGFCF growth shows a coefficient of 0.258 ($p < 0.01$), while current export growth exhibits a coefficient of 0.116 ($p < 0.05$). Notably, current RM2 growth is not statistically significant ($p > 0.10$), suggesting that broad money effects manifest primarily through longer-term channels rather than immediate short-run effects. This temporal pattern indicates that the transmission mechanism for broad money operates with longer lags, possibly reflecting delays in financial intermediation and credit creation processes.

Diagnostic tests confirm model validity. Breusch-Godfrey tests for serial correlation yielded non-significant results ($p > 0.10$) in both models, indicating the absence of autocorrelation. White's test for heteroscedasticity was non-significant ($p > 0.10$) in both specifications. Jarque-Bera tests revealed that the residuals were normally distributed in both models ($p > 0.10$). CUSUM and CUSUMSQ stability tests showed that residuals remained within 5% critical bands throughout the sample period, confirming model stability and coefficient consistency over time.

Table 7a: Diagnostic Test Results for ECM Models

Diagnostic Test	RM1 Model	RM2 Model	Result
Breusch-Godfrey (Serial Correlation)	0.847 (p=0.358)	0.921 (p=0.339)	No autocorrelation
White's Test (Heteroscedasticity)	2.156 (p=0.341)	2.487 (p=0.289)	Homoscedastic
Jarque-Bera (Normality)	1.243 (p=0.537)	1.156 (p=0.561)	Normal residuals
CUSUM Test	Within bands	Within bands	Stable
CUSUMSQ Test	Within bands	Within bands	Stable

Note. Reported statistics are test values with p-values in parentheses. All diagnostics confirm model specification validity.

The empirical findings provide robust evidence of significant relationships between the money supply and economic growth in Nepal from 1975 to 2022. Both real narrow and real broad money measures exhibit substantial long-run elasticities with respect to real GDP of 0.28 and 0.27, respectively, indicating that monetary expansion produces real economic effects. These elasticities align with cross-country empirical evidence: Ogunmuyiwa and Ekone (2010) and Ihsan and Anjum (2013) documented similar positive relationships between the money supply and economic growth in Nigeria and Pakistan, respectively, supporting the finding that monetary aggregates enhance growth through improved financial intermediation.

These results provide qualified support for both monetarist and Keynesian perspectives on monetary transmission. The unidirectional causality from the money supply to real GDP aligns with monetarist theory, as exemplified by Friedman (1956), which emphasizes money's role in economic outcomes and contradicts strict money-neutrality positions. Simultaneously, the significance of capital formation alongside the money supply and the moderate elasticities suggest that financial deepening operates alongside real-sector factors, consistent with endogenous growth theory developed by Romer (1986) and Lucas (1988), which emphasizes financial development as a catalyst for sustained economic expansion. This finding resonates with Beck et al. (2014), who demonstrated that financial deepening positively affects economic growth in developing countries by increasing credit availability.

The differential adjustment speeds observed between RM1 and RM2—with RM2 adjusting more rapidly to equilibrium than RM1—reflect distinct transmission channels for different monetary aggregates. The faster RM2 adjustment (35.8% annually versus 24.2% for RM1) may reflect the greater sensitivity of time deposits to interest rate changes and their more responsive role in financial intermediation, suggesting that broad money operates through more flexible channels than narrow money in Nepal's economy. This finding extends previous Nepal-specific research by Khatiwada (2005), who identified weak transmission mechanisms in Nepal, by demonstrating that transmission mechanisms vary substantially across different monetary aggregates.

The money multiplier analysis reveals that behavioral factors substantially constrain Nepal Rastra Bank's ability to precisely control the money supply through reserve requirement adjustments alone, echoing the findings of Levine et al. (2000) on the importance of financial intermediary behavior. The negative coefficients on currency and excess reserve ratios (approximately -0.38 and -0.06, respectively) indicate that currency leakage and precautionary reserve

holding by financial institutions materially reduce the efficiency of money creation. This result supports Bhatta's (2011) observation that institutional weaknesses in Nepal's financial sector constrain the effectiveness of monetary policy. The positive time deposit coefficient (0.39) demonstrates that portfolio shifts toward longer-term instruments can substantially enhance money creation by reducing average reserve requirements across the deposit base. A 1% increase in the time deposit ratio raises the money multiplier by approximately 0.39%, a substantial effect comparable to changes in reserve requirements, suggesting that financial development and instrument diversification play crucial roles in Nepal's monetary dynamics.

The inclusion of CPI as a control variable reveals negative relationships with real GDP (coefficients of -0.042 for the RM1 model and -0.038 for the RM2 model), indicating that higher consumer prices are associated with lower real economic activity. This negative relationship aligns with Keynesian theory's recognition of price rigidities and inflation's role in reducing real economic activity by increasing uncertainty and reducing investment incentives, supporting the Keynesian perspective that inflation operates as a constraint on real growth rather than reflecting purely demand-driven nominal expansion. This finding complements Modern Monetary Theory's emphasis on resource constraints and productive capacity, suggesting that inflation signals tightening resource availability in Nepal's economy.

The money supply-growth relationship in Nepal operates through multiple channels consistent with Keynesian transmission mechanisms. First, monetary expansion increases credit availability, lowering borrowing costs and stimulating investment in capital formation (GFCF elasticity of 0.56), mirroring the investment channel emphasized by Keynes (1936). Second, monetary expansion supports external trade by reducing liquidity constraints on exporters and boosting import-competing domestic production (exports elasticity of 0.065 to 0.087), thereby extending monetary transmission to the open-economy dimension.

These findings indicate that monetary policy can meaningfully influence economic growth in Nepal, consistent with findings from comparable developing countries. The moderate long-run elasticities and relatively slow adjustment speeds in the RM1 model suggest that structural constraints in Nepal's financial system, including underdeveloped financial markets and transmission mechanisms, limit the magnitude and speed of monetary policy effects compared to more financially developed economies, supporting Maysami and Koh's (2000) observation that monetary relationships vary with institutional development. These results support Poudel's (2018) emphasis on coordinated fiscal and monetary policies, as the

moderate elasticities suggest that monetary policy alone operates within constraints that require complementary policy approaches.

Conclusion

The findings revealed significant positive long-run relationships between both measures of real money supply and economic growth, with elasticities of 0.28 for narrow money (RM1) and 0.27 for broad money (RM2). The magnitude of these elasticities indicates that monetary expansion has economically meaningful effects on growth. Error-correction models indicated that deviations from long-run equilibrium are corrected at differential annual rates of 24.2% for RM1 and 35.8% for RM2, reflecting different adjustment dynamics for narrow and broad monetary aggregates. The analysis of the money multiplier showed that behavioral factors, such as currency holdings and time deposit preferences, significantly influence money creation in Nepal's banking system, with currency leakage reducing the multiplier by approximately 0.38% for each percentage-point increase in the currency ratio.

These findings provide qualified support for both monetarist and Keynesian perspectives on the money-growth relationship, suggesting that monetary policy can meaningfully impact economic growth in Nepal while acknowledging the complex interplay between monetary and real variables. The significant but moderate long-run elasticities indicate that monetary policy effects may be constrained by structural factors in Nepal's financial system, consistent with previous studies that highlight underdeveloped financial markets and transmission mechanisms. The inclusion of CPI as a control variable revealed negative relationships with real growth, supporting the view that higher inflation reduces economic activity through uncertainty and investment disincentives.

Based on these findings, it is recommended that Nepal Rastra Bank adopt a comprehensive monetary policy approach that accounts for the differential transmission channels and adjustment speeds of narrow and broad money aggregates. Financial inclusion initiatives to reduce currency holdings outside the banking system could enhance the effectiveness of the money multiplier and strengthen monetary policy transmission. Such initiatives might include expanding banking infrastructure in rural areas, reducing banking transaction costs, and building financial literacy. The central bank should monitor time deposit ratios and their responsiveness to interest rates, as portfolio shifts toward time deposits offer opportunities to enhance monetary creation efficiency without increasing the burden on banks of reserve requirements.

Agenda for future research

Future research could extend this analysis by incorporating additional control variables such as financial development indicators, institutional quality measures, and external sector dynamics, including remittances, which play a significant role in Nepal's economy. Exploration of the asymmetric effects of monetary expansion and contraction, as well as threshold effects at different stages of financial development, would further enrich the understanding of the money supply-growth nexus in developing economies such as Nepal.

References

Abel, A. B., Bernanke, B., & Croushore, D. (2020). *Macroeconomics* (Global ed.). Pearson.

Adesoye, A. (2012). Price, money and output in Nigeria: A cointegration causality analysis. *African Journal of Scientific Research*, 8, 428–442.

Ajibola, J. O., Oladejo, T. I., Adedapo, K., & Agunbiade, K. A. (2024). The role of private investment and the relationship between monetary policy and economic growth in Nigeria. *International Journal of Research and Innovation in Social Science*, VIII(V), 1–12. https://doi.org/10.47772/ijriss.2024.805048

Akinlo, A. E. (2007). The stability of money demand in Nigeria: An autoregressive distributed lag approach. *Journal of Policy Modeling*, 29(4), 559–566. https://doi.org/10.1016/j.jpolmod.2007.02.003

Asigbetse, S., Arthur, J. L., Amoako, K. O., Marfo, E. O., & Arthur, S. D. (2022). An empirical assessment of the nexus between sectoral structure, inflation, exchange rate and economic growth in Ghana. *Open Journal of Business and Management*, 10(5), 2242–2275. https://doi.org/10.4236/ojbm.2022.105113

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2014). Financial structures and economic growth: A cross-country comparison of banks, markets, and development. *Journal of Banking & Finance*, 27(3), 423–452. https://doi.org/10.1016/j.jbankfin.2014.01.032

Bhatta, G. (2011). Financial development and economic growth in Nepal. *Economic Journal of Nepal*, 34(2), 1–24.

Boucher, J., & Flynn, A. (1996). Breaks in money demand. *Southern Economic Journal*, 63, 496–506.

Brooks, C. (2019). *Introductory econometrics for finance* (4th ed.). Cambridge University Press. https://doi.org/10.1017/9781108524872

Bullard, J. B. (1999). Testing long-run monetary neutrality propositions: Lessons from the recent research. *Federal Reserve Bank of St. Louis Review*, 81(3), 57–77.

Central Bureau of Statistics. (2022). *National accounts of Nepal*. Government of Nepal, Ministry of Finance.

Chaker, M. N., Inguva, S., & Çetin, R. (2012). The impact of money supply on economic growth: A case study of the United Arab Emirates. *Journal for Global Business Advancement*, 5(1), 7–24. https://doi.org/10.1504/jgba.2012.048121

Dang, V. D., & Huynh, J. (2022). Monetary policy and bank performance: The role of business models. *The North American Journal of Economics and Finance*, 59, 101602. https://doi.org/10.1016/j.najef.2021.101602

Fisher, I. (1911). *The purchasing power of money: Its determination and relation to credit, interest and crises*. Macmillan.

Fisher, M. E., & Seater, J. J. (1993). Long-run neutrality and superneutrality in an ARIMA framework. *The American Economic Review*, 83(3), 402–415.

Friedman, M. (1956). *The quantity theory of money: A restatement*. In M. Friedman (Ed.), *Studies in the quantity theory of money* (pp. 3–21). University of Chicago Press.

Friedman, M., & Schwartz, A. (1963). *A monetary history of the United States 1867–1960*. Princeton University Press.

Gordon, R. J. (1990). What is new-Keynesian economics? *Journal of Economic Literature*, 28(3), 1115–1171.

Gyanwaly, R. P. (2012). Causal relationship between money, price and income in Asian countries (1964–2011). *Economic Journal of Nepal*, 35(1), 1–18. https://www.nepjol.info/index.php/EJON/article/view/13409

Hussain, M. E., & Haque, M. (2017). Remittance and consumption volatility in South Asian countries. *Economic Modelling*, 64, 115–124. https://doi.org/10.1016/j.econmod.2017.03.011

Ihsan, & Anjum. (2013). Impact of money supply on GDP: A cointegration and error correction approach. *The Pakistan Development Review*, 52(3), 213–231.

Jamie, E. (2006). The quantity theory of money: Evidence from the United States. *Economics Bulletin*, 5(2), 1–6. https://ideas.repec.org/s/ebl/ecbull.html

Kelton, S. (2020). *The deficit myth: Modern monetary theory and the birth of the people's economy*. PublicAffairs.

Keynes, J. M. (1936). *The general theory of employment, interest and money*. Macmillan.

Khatiwada, S. (2005). Monetary policy transmission in Nepal. *Nepal Rastra Bank Bulletin*, 42, 1–18.

Laidler, D. E. (1975). *Money and macroeconomics: The selected essays of David Laidler*. Edward Elgar Publishing.

Laidler, D. (1981). Monetarism: An interpretation and an assessment. *The Economic Journal*, 91(361), 1–28. https://doi.org/10.2307/2231691

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46(1), 31–77. https://doi.org/10.1016/s0304-3932(00)00017-9

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3–42. https://doi.org/10.1016/0304-3932(88)90168-7

Maysami, R. C., & Koh, T. S. (2000). A vector error correction model of the Singapore stock market. *International Review of Economics & Finance*, 9(1), 79–96. https://doi.org/10.1016/s1059-0560(99)00043-6

Ministry of Finance. (2022). *Economic bulletin*. Government of Nepal.

Mosler, W. (2012). *The job guarantee: A path to full employment*. Levy Economics Institute of Bard College.

Nepal Rastra Bank. (2022). *Monetary policy framework and implementation*. Government of Nepal, Central Bank.

Ogunmuyiwa, M. S., & Ekone, A. F. (2010). Money supply–economic growth nexus in Nigeria. *Journal of Social Sciences*, 22(3), 199–204. https://doi.org/10.1080/09718923.2010.11892802

Poudel, R. P. (2018). Monetary policy transmission mechanism in Nepal. *Central Bank of Nepal Working Paper Series*, 1–35.

Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94(5), 1002–1037. https://doi.org/10.1086/261420

RPS Submitter, B. D., Askandarou, D., Jacolin, L., & Rabaud, I. (2021). Foreign direct investment and domestic private investment in sub-Saharan African countries: Crowding-in or out? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3866402

Sims, C. A. (1992). Interpreting the macroeconomic time series facts. *European Economic Review*, 36(5), 975–1000. https://doi.org/10.1016/0014-2921(92)90041-t

Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70(1), 65–94. https://doi.org/10.2307/1884513