
Impact of Money Supply and Inflation on Economic Growth

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Abstract: *Understanding the impact of money supply and inflation on Nepal's economic development is the main objective of the current study. This work aims to give empirical backing to the current debate over money supply, inflation, and the relationship between these factors and economic growth. More research has been done recently on the relationship between money supply and economic growth than on any other topic in the field of monetary economics. A price increase that, over time, results in a decline in buying power is known as inflation. This study looks at how inflation and the money supply affected economic development between 1974–1975 and 2022–2023. When establishing if there is long-term co-integration among variables when the bound test has been applied, the ARDL co-integration approach is employed in the study to ascertain the link between the variables. GDP is the dependent variable, and the independent variables are broad money (M2) and consumer price inflation (CPI), respectively. The notion that inflation is always a monetary event needs to be revisited and reevaluated, particularly in light of the distinct dynamics of inflation in developing economies. The research indicates a positive correlation between CPI and economic growth. The data indicates that CPI has a significant influence on economic growth in emerging nations like Nepal.*

Keyword: *Economic Growth (GDP), CPI, M2, ARDL.*

1. INTRODUCTION

One of the most important topics in economics is the link between the money supply, inflation, and economic growth. It is especially important to comprehend this relationship and its implications for economic development in Nepal, a small landlocked country in South Asia. Studying how the money supply and inflation affect economic growth is crucial as Nepal works to overcome its developmental obstacles and raise the standard of living for its people.



The entire amount of money that is accessible in an economy at any given time is referred to as the money supply. It is essential to determining the general state of a nation's economy. Nepal has had substantial changes in its monetary policy framework since implementing a market-oriented economic strategy in the early 1990s. These changes have had an impact on the country's money supply, inflation rates, and economic growth. The process of money supply in the economy shows how such a money stock is created. Understanding the money supply process is crucial for the efficient implementation of monetary policy in order to achieve its intended objectives. A thorough understanding of the money creation process, including the level of central bank control, is possible through an examination of the money supply, which is crucial for monetary management. [1] Assert that monetary policy is influenced by the manner in which the banking system, the public, and the central bank interact to produce monetary aggregates. Understanding the money supply is especially crucial when monetary policy views monetary aggregates as a target intermediate.

Conversely, inflation denotes the persistent rise in the average cost of goods and services within an economy over a period of time. There are advantages and disadvantages to inflation for economic expansion. While the negative impacts include distorting pricing signals and decreasing purchasing power, the good effects include lowering the burden of debt and encouraging investment. In today's environment, macroeconomic challenges include the influence of inflation. Wide-ranging effects include those on a number of macroeconomic variables, including income, savings, investments, real interest rates, and real wages[2]. [3]state that families and companies do not have to accept price swing variances when making daily production decisions when the rate of inflation is sufficiently low.

This study aims to investigate the connection between Nepal's money supply, inflation, and economic expansion. Policymakers can create effective policies to guarantee sustainable economic development and raise the standard of living for the Nepalese people by comprehending the dynamics of this relationship.

Through a number of avenues, the influence of the money supply on economic growth in Nepal is apparent. First off, a rise in the money supply raises aggregate demand, which in turn raises levels of investment and consumption. Consequently, this fosters economic expansion. On the other hand, uncontrollably increasing the money supply may lead to inflationary pressures that erode the real value of money and sow economic uncertainty.

Maintaining a steady and ideal rate of growth for the money supply is essential for fostering economic progress in Nepal. While excessive growth can fuel inflation and have negative impacts on the economy, too little money supply growth can hinder investment and economic prosperity. Therefore, cultivating sustainable economic growth requires striking the right balance.

As was previously established, inflation affects economic growth in both positive and negative ways. In Nepal, an acceptable rate of inflation can create an atmosphere that is favorable to business and investment. It encourages companies to invest in profitable assets and lowers the real value of debt. High and fluctuating inflation rates, however, have the potential to reduce people's and companies' purchasing power, which will ultimately impede economic growth by reducing investment and consumption.

Policymakers in Nepal must comprehend how inflation and the money supply affect economic growth. They must create and put into practice sound monetary policies that support long-term economic growth by keeping inflation and the money supply growth rate steady. Achieving equilibrium among money supply, inflation, and economic growth is crucial for augmenting Nepal's total economic prosperity, generating job opportunities, and elevating the standard of living for its populace.

Research Question

The study tries to answer the following research questions:

- Is there any relationship between the money supply, inflation, and economic growth?
- Do the money supply and inflation affect economic growth?

Objective of the Study

The goal of the current research is to better understand the relationship between inflation and the money supply and Nepal's economic development. The purpose of this study is to provide empirical support for the ongoing discussion on inflation, money supply, and how it affects economic growth. The specific objectives are:

- To access the relationship between money supply, inflation, and economic growth.
- To examine the effect of money supply and inflation on economic growth.

Hypothesis

- H1: There is a relationship between the money supply and economic growth.
- H2: There is a significant effect of inflation on economic growth

Significance of the Study

Like in many other economies, the money supply and inflation have a substantial and complex effect on economic growth in Nepal. The money supply and inflation both have a significant impact on how the economy functions as a whole. Maintaining a stable economic climate that supports Nepal's long-term prosperity requires careful management of the country's money supply and inflation. Effective fiscal and monetary policies must be used by the Nepal Rastra Bank and policymakers to achieve the proper balance and support long-term economic development.

2. RELATED WORKS

Numerous studies on the relationship between money supply, inflation, and economic growth have been carried out in Nepal. This part covers several theoretical ideas as well as the global and Nepalese settings of earlier literature evaluations on the relationship among money supply, inflation, and economic growth.

The relationship between inflation and growth was studied by [4] for twelve developed and developing nations. The annual data from 1948 to 1986 and 1980 to 1988 served as the study's foundation. The German Statistics Bundesamt is one of the data sources (1990). Simple correlation has been used in the study to determine the link between the variables.



The study's empirical results demonstrate that high and sustained growth requires low to zero inflation.

According to [5], price stability is a gauge of inflation, or the degree to which prices generate economic uncertainty and have an impact on economic growth. When a nation's money supply expands more quickly than its GDP, inflation results. Because there is a strong positive correlation between inflation and economic growth, inflation can impede the rate of economic development.

Using annual data for the years 1975 to 2010, [6] examined the growth and inflation relationship to determine the threshold level of inflation in Nepal using the Granger causality test.

The study discovered that there is a 6 percent threshold for inflation and that there is a positive, unidirectional association between inflation and economic growth.

[7] Discovered a threshold for Nepal's inflation rate at 6%, over which growth is adversely impacted while growth below the threshold is positively impacted.

[8] Investigated the connection between Bangladesh's economic expansion and inflation. Data from time series spanning 1976 to 2011 was used in the study. The aim of the study was to examine the actual correlation between inflation and economic expansion in Bangladesh. Trade openness, GDP growth (GDPgr), inflation, and remittance growth are among the variables. The unit root test, stationary test, co-integrated test, VAR model, VAR Granger causality test, impulse response function, and variance decomposition of the error term are only a few of the econometric approaches that were employed in this work. The findings indicate a statistically significant inverse link between Bangladesh's economic growth and inflation. The results of [9] and [10] support the negative correlation between inflation and economic growth.

According to [11], in the long run, Nepal should concentrate on increasing the time deposit component of the overall money supply in order to prevent inflation and promote economic growth. Acharya used data from 1974–1975 to 2017–2018 to examine the relationship between Nepal's money supply, income, and price level. The relationship between nominal money supply (both M1 and M2) and price level, real money supply (both M1 and M2) and real GDP, and nominal GDP and price level separately have all been established in this study. [12], inflation is dangerous only when it exceeds galloping. The findings indicate that inflation has a mixed effect on economic expansion. The current period's rising inflation rate will prevent economic agents from having adequate time to adjust to elevated inflation. Consequently, growing inflation will be detrimental to economic expansion. On the other hand, the economic agent will have a year to make adjustments and lower inflation if the preceding period's inflation was high. Consequently, economic growth was positively impacted by inflation.

According to [13], there is ample empirical support for Ghana's wide money growth between 1983 and 1999. It symbolizes our resolve to change things even though the Central Bank of



Ghana (the Bank) is not autonomous and its policies and money supply are set by the ruling administrations rather than by laws.

3. METHODOLOGY

Research Design: This study uses a descriptive and causal comparative research design. Descriptive research is used to characterize the features of a population, whereas analytical research is used to test theories and draw conclusions about the correlations between variables.

Nature and Source of Data: The secondary data that has been released by various governmental and non-governmental organizations served as the foundation for this research project. The Ministry of Finance's Economic Survey of Nepal provided the secondary data and information. Data have been taken from 1974/75 to 2022/23. The total number of observations is 49.

Data Analysis Tools: Making sure the data is stationary is a prerequisite for beginning time series analysis. Further analysis cannot be performed on non-stationary data, and the resulting conclusion may be erroneous. In our study, Augmented Dickey-Fuller (ADF) is one of the unit root tests that is used. The mean, median and standard deviation are used to describe the nature of the data. An autoregressive distributed lag (ARDL) model is used to analyze the relationship between economic variables. LM serial correlation, heteroskedasticity, and normality are used for diagnostic tests of variables. E-Views software has been used for data analysis.

Model Specification: Finding the connection between Nepal's money supply, inflation, and economic growth is the main goal of the study. Thus, the general framework that may be used to describe economic growth is that the growth function is:

$$GDP = \text{£}(\text{consumer price inflation CPI} + \text{broad money M2})$$

The function can also be represented in a semi-log econometrics format, thus:

$$\text{LogGDP}_t = \alpha + \beta_1 \text{CPI} + \beta_2 \text{LogM2} + \epsilon_t \dots \dots \dots (1)$$

4. RESULTS AND DISCUSSION

Descriptive Statistic: In descriptive statistics, the fundamental characteristics of the data set—such as the mean, median, and standard deviation—are summed up and described.

Table No.1 Descriptive statistic

	GDP	Broad money (M2)	Consumer price inflation (CPI)
Mean	105058.1	90674.01	8.323061
Median	34203.60	15280.01	8.1300
Standard deviation	146184.6	156863.2	4.386917
Observation	49	49	49



Source: output from E- Views 12

Table 1 shows that the GDP has a mean of 105058.1 and a median of 34203.60. This implies that there may be some variation in the GDP figures, possibly due to a few exceptionally high readings that are pushing the mean upward. GDP has a standard deviation of 146184.6, which shows that the numbers are dispersed widely. The median money supply (M2) is 15,280.01, and the mean is 90674.01. The money supply (M2) numbers appear to be quite variable, with a few very high values possibly pushing the mean upward. Money supply (M2) has a standard deviation of 156863.2, which shows that the values are dispersed over a large range. The CPI mean is 8.323061 and the standard deviation is 4.386917, which shows that the numbers are not dispersed.

Unit Root Test

A time series is considered stationary if its mean and variance are invariant. Stationary testing is a crucial procedure for time-series data. In order to solve the spurious regression issue, this test will look at the data integration order. The data's stationary has been tested using the augmented dickey fuller (ADF) test.

Table No. 2: Augmented Dickey Fuller (ADF) test to test Integration Order

Variable	ADF(Constant)		Remark
	At level	At first difference	
LNGDP	0.9206	0.0000	I(1)
LN M2	0.6483	0.0003	I(1)
CPI	0.0000	0.0000	I(0)

Source: output from E-Views 12

In the above table 2, it is concluded that LNGDP and LN M2 are stationary at first difference I (1), whereas CPI is stationary at level I (0). The mixture of I (0) and I (1) suggests the use of the ARDL model.

VAR Analysis: Before executing an ARDL model, it is crucial to determine the ideal lag structure using VAR since the lag length selection can have a big impact on the model's correctness and dependability.

Table No. 3: VAR for optimum lag structure

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-176.9720	NA	0.425185	7.658382	7.776476	7.702821
1	28.81430	376.5451*	9.83e-05*	-0.715502*	-0.243124*	-0.537743*
2	34.80338	10.19419	0.000112	-0.587378	0.239284	-0.276300

Source: output from E- views 12

Three distinct lag structures are displayed in the table: 0, 1, and 2. The table lists the log-likelihood (LogL), likelihood ratio (LR), final prediction error (FPE), Akaike information criterion (AIC), Schwartz criterion (SC), and Hannan-Quinn criterion (HQ) values for each



lag structure. The performance of the various models must be compared using these criteria in order to determine which lag structure is best. The lag structure with the lowest AIC, SC, and HQ values and the least prediction error is considered ideal. It is evident from the table that lag 1 is the ideal lag configuration.

ARDL Long Run and Bound Test

Estimating the ARDL model using a suitable lag length that has been computed in the above VAR lag structure is the first step in the ARDL Long Run and Bound testing. After the model has been estimated, a diagnostic test is conducted to see if the model meets the requirements needed to run the long-run and bound test.

Table No. 4: Autoregressive Distributed Lag (ARDL) Model

Variable	Coefficient	Std. Error	t- statistic	Prob.*
LNGDP (-1)	0.631052	0.097175	6.493967	0.0000
CPI	0.005363	0.001987	2.699378	0.0098
LNLM2	0.285340	0.074607	3.824560	0.0004
C	1.135223	0.289373	3.923039	0.0003

R – squared	0.999119	Akaike info criterion	-2.900245
Adjusted R-squared	0.999058	Schwarz criterion	-2.744312
F – statistic	16623.65	Durbin waston stat.	1.898743
Prob. (f- statistic)	0.00000		

Source: output from E-Views 12

Based on the information shown in Table 4, the coefficient of consumer price inflation is 0.005363, accompanied by a probability value of 0.0098 and a t-statistics value of 2.699378. This empirical finding demonstrates that, at the customary 1% level, consumer price inflation had a positive and substantial relationship with GDP growth in Nepal over the course of the research period.

The data presented in Table 4 indicates that the broad money coefficient is 0.285340, with a corresponding probability value of 0.0004 and a t-statistics value of 3.824560. This empirical result shows that during the research period, broad money had a significant and positive association with GDP growth in Nepal, at the typical 1% level.

Table No. 5: F Bound Test

Level significance	F – statistic	Lower bound	Upper bound
10%	64.494512	2.63	3.35
5%		3.1	3.87
2.5%		3.55	4.38
1%		4.13	5

Source: output from E-Views 12

At every level of significance, the estimated F-statistics in Table 5 are higher than the lower and upper bound values, coming in at 64.494512. The alternative hypothesis—that there is a long-term relationship between the variables—is accepted, and the null hypothesis—that there is no long-term correlation among the variables—is rejected if the estimated F-statistic is greater than the upper bound of the F-distribution. This demonstrates that the variables have a long-term relationship.

The long-run results of the ARDL (1,0,0) model are reported in the table below:

Table No. 6: Result of Long-Run Estimate for ARDL (1,0,0)

Variables	Coefficient	Std. error	t- statistic	Prob.
CPI	0.014535	0.006894	2.108310	0.0407
LNM2	0.773388	0.009814	78.80096	0.0000
C	3.076916	0.119209	25.81108	0.0000

Source: output from E-Views 12

As indicated in Table 6 above, the coefficient of consumer price inflation is 0.014535, with a t-statistics value of 2.108310 and a probability value of 0.0407. This empirical conclusion demonstrates that consumer price inflation had a positive and substantial relationship with Nepal's economic development at the conventional 1% level over the course of the research period. As indicated in Table 6 above, the coefficient of wide money is 0.773388, with a t-statistics value of 78.80096 and a probability value of 0.0000. This empirical conclusion demonstrates that, at the conventional 1% level, the wide money supply had a positive and substantial relationship with economic growth in Nepal during the course of the research period.

Error Correction Model (ECM) Version for the ARDL Model

Sargan (1964) developed the error correction model with level information. The rate at which a dependent variable returns to equilibrium can be directly predicted by ECMs since other (or dependent) variables are subject to change. It is a member of the co-integration class of multiple time series models. The ECMs are a theoretically-based methodology that may be used to estimate the short- and long-term effects of one time series on another, and this is a key point to make.

Table No. 7: Error Correction Model Representation for the Selected ARDL Model

Variable	Coefficient	Std.error	t- statistic	Prob.
CoIntEq(-1)*	-0.368948	0.022226	-16.60022	0.0000

Source: output from E-Views 12

As indicated in Table 7 above, the lagged error correction term is represented by the COINTEQ coefficient, which is relevant due to its statistical significance and proper negative sign. If there is any imbalance in the short run, the coefficient for the error correction term (i.e., -0.368948) indicates the pace of adjustment towards long-run equilibrium. According to the results, any short-run deviations are adjusted at a rate of 36.8948 percent each year towards the long-run equilibrium. A negative sign means that any deviation from the long-



term equilibrium is made up for by returning to it. The coefficient's magnitude indicates the rate of adjustment; a higher coefficient denotes a faster rate of adjustment toward the long-run equilibrium. As a result, a greater absolute value for this coefficient implies that the system reaches long-run equilibrium more quickly.

Diagnostic Test: We can verify the accuracy and dependability of our statistical inferences and derive the right conclusions from the data by carrying out diagnostic tests. Diagnostic tests are as follows:

- Serial correlation test
- Heteroskedasticity Test
- Normality test

Serial Correlation Test

Table No. 8: Serial Correlation Test Breusch-Godfrey Serial Correlation LM Test

F – statistic	0.110547	Prob. F (1,43)	0.7411
Obs*R- squared	0.123085	Prob. Chi squared (1)	0.7257

Source: output of E-views 12

From the above table no. 8, the F-statistic is 0.110547, and the related probability (Prob. F) is 0.7411. We do not have enough data to rule out the null hypothesis that there is no serial association because the likelihood is higher than the standard cutoff point of 0.05.

Heteroskedasticity Test

Table No. 9: Heteroskedasticity Test: Breush-Pagan-Godfre

F – statistic	0.597637	Prob. F (3,44)	0.6199
Obs*R-squared	1.879326	Prob. Chi-square	0.5978
Scaled explained SS	2.823781	Prob. Chi-square	0.4196

source: output of E-views 12

Based on Table 9, the Breusch-Pagan-Godfrey test has a probability value of 0.6199, which is greater than 0.05 and indicates that the data should be homogeneous. Regression analysis results become more trustworthy as a result.

Normality Test

In order to determine whether the residuals, or errors, of the regression model have a normal distribution, a normality test must be run before beginning a regression analysis. A key component of linear regression models is the normalcy assumption, which makes it possible to employ statistical inference techniques like confidence intervals and hypothesis testing. In this context, we are using the normality test to calculate the value of the Jarque-Bera test probability value to identify if the data are normally distributed. According to the Jarque-Bera test, if the value of Jarque-Bera is less than probability, our data is not normally distributed. But according to the Central Limit Theorem [14], when the number of observations is greater than thirty, we can conclude that our data is normally distributed.

5. CONCLUSION

GDP growth in Nepal, both in the short and long terms, are the rate of inflation and the expansion of the money supply, with the latter serving as the primary driver. According to the predicted outcome, policymakers must prioritize the central bank's independence if they hope to lessen the impact of inflation and the money supply on economic growth.

From the perspective of economic growth, Nepal's money supply and inflation are seriously detrimental, or they can play a major but inconsistent role in fostering economic progress. There is still controversy and indecision about the relationship between the three variables, despite some shared or comparable findings. A positive correlation has been shown in several studies between inflation and economic growth. There exists a unidirectional causal relationship between inflation and economic growth, but not a bidirectional relationship between the two.

Monetary policy is important and directly impacts economic expansion. To develop a sustainable economy, however, the government must guarantee macroeconomic stability as well as pricing stability. In recent times, the rise of the money supply has been one of the main drivers of inflation in Nepal. Elevated inflation negatively impacts not only the standard of living of individuals but also the output and business operations of enterprises, exerting pressure on the economy as a whole. Thus, in order to address the current inflationary issues, we need to give special consideration to the money supply alternatives.

Finally, the Nepalese economy's inflation is influenced not just by monetary considerations but also by demand pull, psychology, cost push, and other factors. Therefore, we need to rebuild a rational economy and devise appropriate monetary and fiscal policy measures in order to combat growing inflation. We are able to maintain stability and economic growth over time as a result.

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