

EFFECT OF MACRO ECONOMIC INDICATORS ON ECONOMIC GROWTH OF NEPAL

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ABSTRACT

Purpose: This study examines how Nepal's money supply affects economic growth while taking into consideration important macroeconomic factors including imports, exports and inflation.

Methods: The analysis evaluates the combined impact of using the historical data from the time series spanning between 1975 and 2023. The study made use of Unit Root Test to test the stationarity of variables and Error Correction Model (ECM) for empirical analysis.

Results: The empirical result shows that money supply, inflation, exports, imports and economic growth were interrelated to each other. The variables have long run relationship. Economic growth is positively and statistical significantly influenced by the money supply, indicating that economic expansion is not highly correlated with increases in money supply. Price instability and rising import levels do not significantly impact growth over the research period, as evidenced by the negative but insignificant effects of inflation and imports.

Conclusion: The study concludes that export have a strong positive impact, indicating their important position as a key force supporting Nepal's economic expansion. Overall, the study highlights that export performance remains essential role to maintaining Nepal's economic growth even while monetary and price-related factors have insignificant impact.

Keywords: *Money Supply, Inflation, Exports, and Imports*

I. Introduction

Economic growth means the raise within the Capacity of nation to produce services and Products over a certain period. It's often measured by looking at the Gross Domestic Product is Often employed measure money supply to see how much the economy is growing. Which a country experiences steady economic growth, it leads to higher national income and more jobs, which results in a better standard of living for people. In recent years, the relationship between money supply and output has drawn more attention due to its significance for economic growth in both industrialized and emerging economics (Hussan & Haque,2017). There are Keynesians who believe that "money does matter." Therefore, unimportant to effect economic progress, but some monetarists think that "money does matter." However, the new Keynesians argue that deficient exchange of data and pricing inflexibility, also referred to as price sticking in market, changes in

the money supply appear to have an immediate impact on economic variables like GDP, Inflation, and remittance levels (Hussan & et al,2017). According to ogunmuyiwa and Ekone (2010), economic growth might not be possible in the absence of a suitable money supply, credit, and over financial circumstances. It plays a crucial role in influencing economic growth. In Nepal, studies have shown money supply is positive correlation with economic growth (Kuwar, 2020). These increases are driven by the development of new technologies as well as the necessary institutional and ideological adjustments (Kunznets,1995). In Nepal, the Nepal Rastra Bank (NRB) categorizes money supply into two main aggregates: Narrow Money (M1) and Broad Money (M2). Currency in availability as well as account balance deposits in commercial financial institutions are included in narrow money, whilst time deposit and saving accounts are included in broad money. These aggregates are crucial indicators for assessing the liquidity in the economy.

Economic growth is typically measured by the increase in a country's gross domestic product (GDP), representing the total value of goods and services produced over a specific period. For Nepal, achieving consistent economic growth is essential to improve living standards reduce poverty, and enhance overall development. The correlation between economic expansion and money supply has been extensively studied, with varying conclusions. Classical economic theories, such as the Money's quantity theory, suggest that a rise in money supply results to proportional increase in price levels, assuming velocity and production remain constant. However, in developing economies like Nepal, this relationship can be more complex due to factors like market imperfections and structural challenges. For instance, research by Gyawali (2019) indicates that a rise in the money supply is strongly linked to increasing growth in the economy of Nepal. Similarly, a study by Mahara (2020) found that the money supply helps Nepal's actual expansion of the economy, suggesting a long-term association between money supply and gross domestic product (GDP).

Nepal is a developing country with a weak macroeconomic environment, and the economic growth is mainly depends on monetary policy instruments, inflation controls, increase in exports, and imports of capital goods. Nepal's economy is still growing unevenly despite a lot of financial and regulatory changes. It is characterized by a strong reliance on remittance inflows, ongoing inflation, and a growing money supply (Nepal Rastra Bank,2023). According to monetary theory, adjustments to the money supply may increase economic activity by influencing investment,

consumption, and interest rates (Friedman, 1968). An increasing inflation may hamper long-term growth decreasing purchasing power, preventing saving, and discouraging investment (Mikashkin, 2007). Monetary policy is often seen as a combination of the reason and an impact of inflation.

There is little study that concurrently looks at the combined effects of money supply, inflation, exports and imports on Nepal's economic growth while the fact that scholarly interest in these individual factors is expanding. The majority of empirical research ignores how these macroeconomic variables interact within a larger economic framework in favor of focused on bilateral interactions. Therefore, by examining the combined effects of money supply, inflation, exports and imports on the nation's economic growth, this study aims to fill a significant gap in the Nepalese economic literature. This study will increase our awareness of macroeconomic trends and offer evidence-based recommendations to policymakers who want to achieve stable and reasonable growth.

Previous research indicates a favorable relationship between the money supply and economic growth (Kunwar et al., 2023). A significant, consistent correlation between GDP, an indicator of economic growth and money supply (Kunwar, 2020). The money supply and GDP growth are casually related in two-way causality (Joshi, 2022). In Ghana, the money supply has a significant positive impact on RGDP, but in Nigeria, it has an insignificant negative impact (Omodero, 2019). Both in the short and long term, the money supply and economic growth are significantly positive correlated (Dingela & Khobai, 2017). The empirical findings show long-term correlation between the various factors and money supply has positive significant impact on the economy growth (Galadima & Ngada, 2017). The decrease in growth is the result of resources being diverted from activities that provide higher growth rates to activities associated with reducing inflation rates (Marshall, 2016). The causes of inflation over the long run caused by ongoing expansion of the money supply, whereas short-term inflation is not brought on by ongoing economic development (Doal, 2020). According to Gatawa et al., (2017), the short-term statistical analysis confirmed that money supply and economic growth had a negative relationship.

According to Esfahani (1991), there are statistically significant correlations between increasing exports and increasing output. The link is mostly due to exports' ability to reduce import shortages that limit the expansion of manufacturing. The result also highlighted the need of export promotion for countries that lack sufficient funding or outside assistance. Uddin et al., (2010) examined the

casual relationship between export, import, and GDP for Bhutan. The result shows that a long-term equilibrium relationship between the variables is predicted by the co-integration analysis. Akhter (2015) investigates to how imports and exports affect Bangladesh's economic growth as well as the connection between imports, exports, and economic growth, exports have a positive relation. This study's objectives: To measure the relationship between macroeconomic indicators such as money supply, inflation, exports, imports and economic growth and To analyse how macroeconomic indicators, including as money supply, inflation, exports, and imports, effects on economic growth.

II. Reviews

According to classical theory, money is neutral, meaning it only influences prices levels and not other aspects of the economy. There is a separation between the real sector (goods and services) and the monetary sector (money). In their view, money policy is useful for controlling prices but not for promoting economic growth (Paudel, 2015). New classical economists believe that if people have rational expectations, policies aimed at managing demand won't work effectively. This is because producers aim to maximize their satisfaction making expectations a key factor in economic decisions. According to new-classical economists, money has no effect on effect on output and only affects the general level of prices in the near term (Paudel, 2015). Monetarists theory believes that changes in the money supply take time to show their full effects on should increase the money supply at a steady rate, considering factors like GDP growth, inflation, and other economic conditions. people customize their expenditure because they believe in future price increases and saving decisions accordingly according (Ahuja, 2022).

Kunwar (2020), examined how changes in the money supply affected the country's growth in GDP. The ARDL method was used as the methodological framework by the researcher. The findings demonstrated significant association between money supply and economic growth of Nepal. The study gives to the conclusion that managing Nepal's money supply was essential for promoting long-term economic growth. These findings' implications can help policymakers create sound monetary policies that support national stability and economic growth. Additionally, they discovered that a nonlinear relationship exists. Mahara (2021), showed a beneficial linkage among the money supply and economic growth, concluding that an increased supply of cash promotes economic growth. According to Kunwar et al. (2023), monetary expansion promotes economic

development in Nepal, as both narrow and broad money supply have positive effects on GDP growth.

H1: There is significant a significant effect of money supply on economic growth in Nepal.

According to primary policy message, output could increase by 0.5% to 1% decrease in inflation. There has been debate on how inflation affects Nepal's economic growth. Joshi (2021), observed that inflation, which is influenced by the money supply and outside forces, can negatively impact economic stability. On the other hand, Kunwar et al., (2023), showed a positive correlation between economic growth and the consumer price index (CPI), indicating that in developing nations like Nepal, moderate inflation can be connected to economic growth.

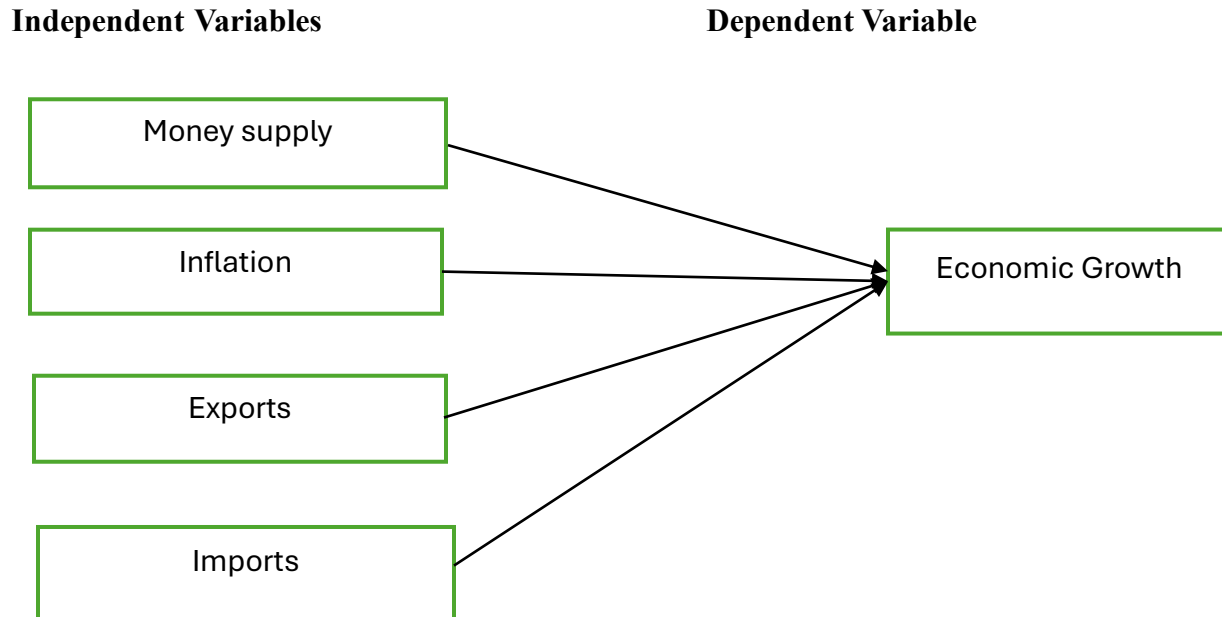
H2: There is a significant effect of inflation on economic growth in Nepal.

According to Burney (1996) examined the growth equation based on cross-country data and the relationship between export growth and economic growth (GDP), using OLS and random coefficient (RC). An estimate of the association has been made for two separate period of time, namely 1965-1980 and 1980-1990. Even if exports and growth in economic are positively Connection, the estimates derived from an RC technique show that this link is only significant for the years 1980-1990. VECM is suggested by the DF test. This study examined the relationship between Bangladesh's imports and GDP growth using time series data from 1981 to 1992. Based on the analysis, the researcher has determined that imports and GDP have a negative relationship, or that imports have a negative relationship with GDP growth and imports and GDP growth rate have a negative relationship.

H3: There is a significant effect of imports and exports on economic growth in Nepal.

Figure 1

Research framework



Note: Adopted from Upadhyaya et al., (2022)

III. Methodology

The data for studying economic growth in Nepal can be used secondary data sources. This includes historical growth rates, including monetary policy statements, annual reports, and economic bulletins, Ministry of Finance's Economic Survey, and growth indices like the GDP represents the overall worth of goods and services produced in the nation in previous year, which track the overall economic growth. Macro-economic indicator such as money supply (M20 which includes time deposit and saving deposit in all accounts as availability amount for investment on production sectors, inflation (CPI) shows how much change in price of basket of customer goods and services imports include total purchase products and services from other countries.

This study has applied descriptive and casual research design, meaning that study described the economic growth's behaviour and also look for cause and effect relationship between different factors and economic growth. The observation period of this study is from 1975-2023. The macroeconomics data like money supply, inflation, exports and imports are taken for the period

and GDP will be taken as the proxy of economic growth in Nepal. All data are taken from Nepal Rastra Bank.

Methods of Analysis

The study will use a combination of statistical techniques for understanding which variables are related to economic growth is converted into econometrics model.

$$GDP_{it} = \beta_0 + \beta_1 MS_{it} + \beta_2 IR_{it} + \beta_3 EX_{it} + \beta_4 MY_{it} + \mu_{it}$$

Where

GDP = Gross Domestic Product

β = coefficient for each independent variable

MS = Money Supply

IR = Inflation Rate

EX= exports

MY= imports

μ = mean

Taking log both side

$$\text{Log GDP} = \beta_0 + \beta_1 \log MS + \beta_2 \log IR + \beta_3 \log EX + \beta_4 \log MY + \epsilon_t$$

Where

GDP = Gross Domestic Product

MS = Money Supply

IR = Inflation Rate

EX= exports

MY= import

β_0 = Constant term (intercept)

$\beta_1, \beta_2, \beta_3, \beta_4$ = coefficient for each independent variable

ϵ_t = Error term representing unobserved factors.

Augmented Dickey-Fuller (ADF) Unit Root Test

A method of statistical analysis called a time series' stability can be evaluated executing ADF test. In time series analysis, the ADF test is frequently used to determine whether data need differentiating prior to modelling.

Co Integration Relation

A statistical relationship known as co-integration occurs when two or more non-stationary time series variables move together over time and establish a stable equilibrium even though they are not individually stationary. Determining co-integration is crucial for creating reliable models that reflect the long-run connections between elements as well as near-term variations.

Error Correction Model (ECM)

An error correction model is an empirical method was adopted to examine the short-term and long-term correlations between co-integrated time series variables. An ECM assists in describing how short-term aberrations from a long-term equilibrium connection between two or more variables are gradually corrected over time.

Residual Diagnosis

Residual diagnosis is act of the analyzing a statistical or econometric model's errors, or residuals, to determine how well the model fits the data and whether significant presumption are met. Once a model has been estimated, analysts look for patterns in the residuals that can

point to issues like auto-correlation, heteroskedasticity, non-linearity, or breaches of normality test.

Autocorrelation Test

The auto-correlation test is a statistical model for assessing whether the residuals (errors) in a time series or regression model show cross-time correlation. One statistical analysis for identifying serial correlation is the Breusch-Godfrey series relation LM testing, or auto-correlation, in regression model residuals.

IV. Results and Discussion

This chapter provides the empirical results and diagnostic checks of the analysis which uses historical data from time series over 1975 to 2023 to examine how macroeconomic indicators affect on economic growth in Nepal. The analysis employs the ECM modelling approach, including unit root test, cointegration analysis, estimation of long run coefficient, heteroskedasticity test, and a range of residual diagnosis normality test and autocorrelation test.

Table 4.1

Augmented Dickey-Fuller Unit Root Test at Level Data (Intercept).

Variables	t-value	P-value	Remarks
LNGDP	0.117864	0.9639	Non-Stationary
LNMS	-1.262065	0.6394	Non-Stationary
LNCPI	-1.344063	0.6015	Non-Stationary
LNEX	-1.297547	0.6234	Non-Stationary
LNMY	-1.908690	0.3257	Non-Stationary

Note. Output of Eviews 11

The all indicators’ P-values are higher than 0.05, the results show that LNGDP, LNMS, LNCPI, LNEX and LNMY are non-stationary at their level forms. This implies that any series shows trends or non-constant variance over time because it is impossible to reject unit root null hypothesis with every variables. Thus, before performing additional econometric analysis like regression or co-integration tests, these variables must be difference or otherwise transformed to ensure stationary.

Table 4.2

Augmented Dickey- Fuller Unit Root Test at Level Data (Intercept and Trend).

Variables	t-value	P-value	Remarks
LNGDP	-2.984543	0.1471	Non-Stationary
LNMS	-2.066657	0.5504	Non-Stationary
LNCPI	-1.334823	0.8667	Non-Stationary
LNEX	-1.107416	0.9171	Non-Stationary
LNMY	-2.688984	0.2456	Non- Stationary

Note. Output of Eview 11

The results show that all variables' LNGDP, LNMS, LNCPI, LNEX and LNMY are non-stationary at their level forms, as indicated by p-values higher than 0.05. this implies that any series has a time-dependent trend or fluctuating mean and variance as the unit root's null hypothesis is unable to reject in any indicators. Therefore, doing any econometric analysis, such as cointegration or regression testing, these variables must be differenced or otherwise changed to ensure stationary.

Table 4.3

Augmented Dickey-Fuller Unit Root Test at First Difference Data (Intercept)

Variables	t-value	P-value	Remarks
D(LNGDP)	-6.61554	0.0000	Stationary
D(LNMS)	-4.883903	0.0002	Stationary
D(LNCPI)	-5.271494	0.0001	Stationary
D(LNEX)	-5.821795	0.0000	Stationary
D(LNMY)	-6.438058	0.0000	Stationary

Note. Output of Eview 11

The all first-difference variables' P-values are less than 0.05, the results show that DLNGDP, DLNMS, DLNCP, DLNEX and DLNMY are stationary. This indicates that each variable does not show trends or changing variance after differencing, as an every variables, the unit root's null hypothesis is rejected. Therefore every variable is included in value one, making them appropriate for additional analysis such cointegration testing to look at long-term correlations.

Table 4.4*Augmented Dickey- Fuller Unit Root Test at First Difference Data**(Intercept and Trend)*

Variables	t- value	P- value	Remarks
D(LNGDP)	-6.504919	0.0000	Stationary
D(LNMS)	-5.039322	0.0009	Stationary
D(LNCPI)	-5.690225	0.0001	Stationary
D(LNEX)	-5.834221	0.0001	Stationary
D(LNMY)	-6.584998	0.0000	Stationary

Note. Output of Eview 11

All of the first-difference variables' DLNGDP, DLNMS, DLNCPI, DLNEX, and DLNMY are stationary, according to the results, as demonstrated by their highly significant p-values (all below 0.05). This indicates that each variable's null hypothesis of a unit root is rejected, confirming that they stable during first differencing. As a result, all variables are integrated of order one, making them suitable for additional econometric analysis such co-integration testing for possible long-term correlations between variables.

Table 4.5*Long Run Relationship (Co Integration Relationship)*

Variables	Coefficient	t-statistics	P-value
LNMS	0.227	6.883	0.000
LNMY	-0.089	-2.298	0.027
LNEXPORTS	0.042	3.189	0.003
LNCPI	0.020	0.232	0.818
C	10.408	54.84	0.000
R-square = 0.997		F-statistic = 4682.373	
prob (f-statistics) = 0.000		D.W = 0.884	

Note. Output of Eview 11

The finding indicate that LNMS significantly and strongly enhances the variable which is dependent, while LNMY shows a significant negative association. LNEX also shows positive and statistically significant impact, showing it contributes considerably to the model. In constant term

(C) is significant and extremely important, showing a substantial baseline level in the model. The model demonstrates a great overall fit through R-squared within 0.997, suggesting thus 99.7% regarding a difference among the dependent variable has been described with the help of regressors. F-statistics is quite high and its value of probability is 0.000, showing given the statistical significance of the model, as a whole. However, the remaining value may have positive correlations between variables, as indicated by the Durbin-Watson (D.W) value that is 0.884, indicating that further diagnostic checking may be needed.

Table 4.6

Residuals Error Correction Model (Trend)

Residuals	t-statistics	Prob
ECM	-4.934	0.000

Note. Output of Eview 11

The residuals diagnostic results shows that the ECM term is extremely significant, with an extremely negative t-statistic (-4.934) and a p-value of 0.000, indicating an effective and statistically significant error-correction impact. This demonstrates that any short-run deviations from the long-run equilibrium are adjusted fast, validating the validity of the underlying long-run relationship in the model.

Table 4.7

Error Correction Test at Level Data (Trend + Intercept)

Variables	Coefficient	Std. Error	t-statistics	Prob.
ECT(-1)	-0.557	0.113	-4.934	0.000

Note. Output of Eviews 11

The results suggest that the ECT (-1) term is detrimental as well as highly associate having a value of p within 0.000 and coefficient towards -0.557, indicating an excellent rate of adjustment toward long-term equilibrium. The substantial t-statistic (-4.934) demonstrates that departures from the long-term relationship are corrected by around 55.7% per period, suggesting a constant and valid long-run relationship in the model. Money supply, inflation, exports, imports and economic growth are co-integrated.

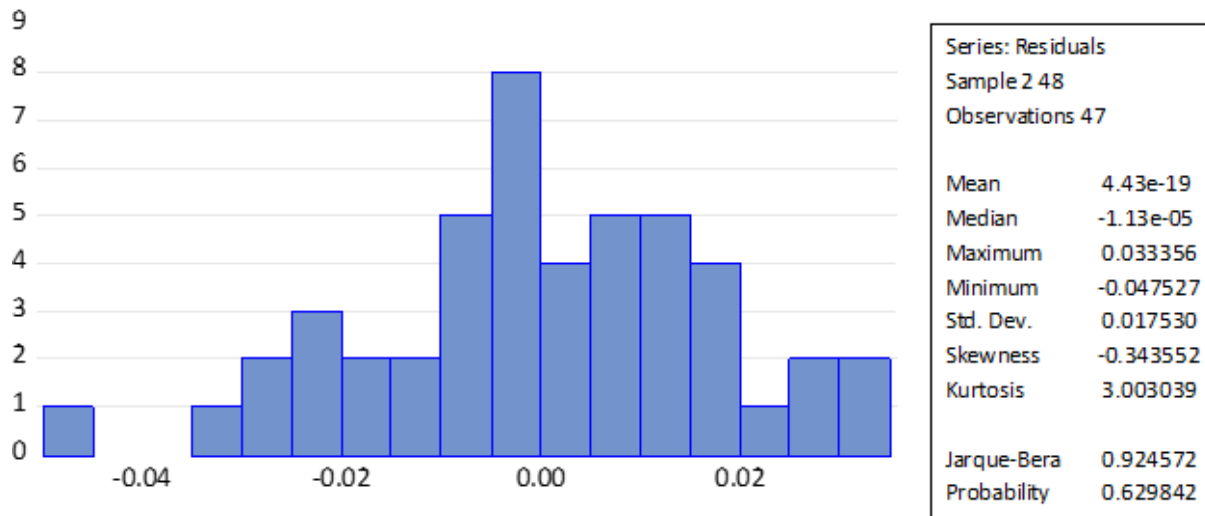
Table 4.8*Error Correction Model (ECM)*

Variables	Coefficient	t-statistics	Prob.
ECT(-1)	-4.403	-3.478	0.001
DLNMY	-0.005	-0.157	0.876
DLNMS	0.051	0.750	0.458
DLNEXPORTS	0.066	4.393	0.000
DLNCPI	-0.102	-1.214	0.232
C	0.032	2.896	0.006
R-square = 0.485		F-statistics = 7.729	
prob (F-statistics) = 0.000		D.W = 1.686	

Note. Output of Eview 11

The results demonstrate that the error correction term ECT (-1) is negative and very significant, indicating a strong and adjustment towards long-run equilibrium. Among the explanatory factors, DLNEX is the only one with a significant positive effect, suggesting that changes in exports significantly affect the dependent variable in the short run. The coefficients for DLNMY, DLNMS, and DLNCPI are statistically insignificant, showing they do not appreciably alter short-term dynamics in this model. A positive baseline effect is indicated by the positive and significant constant term (C). The value of R-squared is 0.485 indicates model explains 48.5% of the variation in the variable under study. The entire model is significant in statistical terms, as indicated by the F-statistic of 7.729 and a probability value that is 0.000, meaning that descriptive factors collectively impact of dependent variable. The Durbin-Watson score of 1.686 suggests that the residuals values do not have significant correlating issue, indicating an appropriate model fit.

Residuals Dynosis



The distribution of regression model residuals is shown by the histogram and statistics table that correlative with it. Because of the bell-shaped histogram and the Jarque-Beta test statistic of 0.924572 having a p- value at 0.629842, whichever much greater than the significance value of 0.05, residuals seem are normally distributed because null hypothesis has been accepted since the p- value is higher rather than 5%. Both residuals mean and median are extremely near to zero, indicating that there is no significant bias. The dispersion is extremely small, with a S.D of 0.1753. although skewness is slightly a small leftward skew, kurtosis is 3.003, which is nearly identical of a normal distribution (Kurtosis)=3). Overall, the residuals meet the normality assumption demonstrating the validity of the regression model and the dependable nature of statistical inference.

Table 4.9*Breusch-Godfrey Serial Correlation LM Test.*

Test Statistic	Value	p-value
F-statistic	1.063	0.355
Obs*R squared	2.428	0.297

Note. Output of Eview 11

The Breusch-Godfrey Serial Correlation LM test findings are shown in the table. The Obs*R-squared value (2.4282) and its p-value (0.2970), as well as the F-statistic (1.062) and its p-value (0.3554), show that the p-values are significantly higher than 0.05. The results suggest that the null hypothesis, according to which there is not serial association, has not been rejected because there is insufficient residuals show indications of correlation between indicators.

Table 4.10*Heteroskedasticity Test: Breusch- Pagan- Godfrey.*

Test Statistic	Value	p-value
F- statistic	0.728	0.606
Obs* R-squared	3.836	0.573

Note. Output of Eview 11

The table shows the finding of a test for heteroskedasticity. The Obs*R-squared value of 3.8367 with a p-value is 0.5732 as well F-statistics is 0.7289 with a value of p is 0.6058 show that p-values are significantly higher than the 0.05 significance level. These results recommend that there is no statistically significant heteroskedasticity in the model. Since the null hypothesis of homoskedasticity (constant variance of residuals) doesn't get rejected, the model most likely meets this important OLS assumption.

Discussion

The relationship between Nepal's microeconomic indicators and economic growth was examined in the present study, analysing their long run effects along with other key macroeconomic variables such as inflation, exports and imports. The economic growth is positively impacted by the money supply. The above result similar to empirical studies (Johansen, 1988; Ahemad et al., 2016; Sims, 1972; Taylor, 1991; Greenwood & Johanovic, 1990) draws the conclusion that the money supply has a strongly associated with economic growth. This study is inconstant with Gatawaetm et al., (2017) showed that money supply and economic growth were negatively correlated. Similar researcher has shown that money supply has in insignificant impact on Nigeria(Omodero,2019). Inflation has a negative but statistically insignificant impact on economic growth. This result is similar to Wai, 1959; Mukoka, 2018; Zohaib, 2020; Oyedle et al., 2016; Edemina,2021; Khan & Khan 2018) examine that inflation has a negative and statistically insignificant relationship with economic growth. This study is inconstant with Kunwar et al., (2023) showed a positive relationship between economic growth and consumer price index (CPI).

Long-term economic growth is positively and significantly impacted by exports. This result is consistent with Devkota (2023), Emery (1967), Sann (2017), Fosu (1990) and Adeleve et al., (2016) examined that exports had a long-term positive effect on economic growth. This result is inconstant with Tivatvi et al., (2022) examine that exports have a positive relationship in short term but not validated in the long term. Meanwhile, imports exhibits a negative and insignificant impact on economic growth in Nepal. This result alights with the findings of Bakari and Krit (2017); Millia et al., (2021); Toda and Yamamoto, (1995) have support the concept that imports have a negative impact on economic growth. This study is inconstant with Mishra (2012); Ali and Li (2016) found a positive correlation between imports and long-term economic growth. As

advanced technologies are applied, imports increase productivity to compete in the global market, which eventually results in economic growth, (kim et al., 2007).

V. Conclusion and Implications

The analysis highlights the connection between Nepal's money supply and economic growth, analysing their long run effects along with other key macroeconomic variables such as inflation, exports and imports. An increase in the money supply may stimulate consumption and investment, but if it is not well managed, it may lead to inflation, which would reduce purchasing power and create economy instability. While excessive inflation decreases saving and trust, moderate inflation can promote growth. While excessive imports may affect domestic sectors and increase the trade deficit. Exports are necessary to create jobs, production and collect foreign exchange. To achieve sustainable economic growth, Nepal needs to manage a balance between supporting goods monetary policies, reducing inflation rate and imports, promoting export of organic and value-added products to avoid inflation and encourage domestic business.

The dependence of macroeconomic indicators suggest that no single issue should be taken into account independently when developing economic policy. Nepal needs a well-coordinated macroeconomic framework that includes monetary, industrial, trade, and fiscal policy. The efficacy and involvement of policymaking can be enhanced by constantly evaluating the interrelated factors data-driven techniques. The study identifies key macroeconomic indicators; it is crucial to align these with goals for reasonable and sustainable growth. Issues like young unemployment, environmental sustainability, and regional inequality should all be addressed via economic growth doesn't come at the expense of long-term resilience and that its advantages are distributed equitably.

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