Assessing the Impact of Capital Expenditure, Export, Money Supply and Inflation on Economic Growth in Nepal: An ARDL Approach

A Research Report

Submitted to

Center for Research and Development,
Research and Consulting Services Department,
Nepal Administrative Staff College

Submitted by

Krishna Bahadur Thapa

June, 2025

Table of Contents

Chapter I: Introduction 1

1.1 Background of the Study 1

1.2 Statement of the Problem 3

1.3 Objectives of the Study 4

1.4 Research Questions and Hypotheses 4

1.5 Rationale of the Study 18

1.6 Limitations 18

Chapter II: Review of Literature 19

2.1 Empirical Review 19

2.3 Theoretical Framework 21

Chapter III: Methodology 24

3.1 Research Design 24

3.2 Data Sources 24

3.3 Study Area 24

3.4 Sampling 24

3.5 Study Variables 24

3.6 Data Collection and Management 24

3.7 Ethical Considerations 25

Chapter IV: Results and Discussions 26

4.1 Presentation of Results 26

4.2 Descriptive Analysis 30

4.3 Inferential Analysis and Discussion 32

4.3.1 Long-Run Equilibrium Analysis 32

Chapter V: Conclusion 41

Chapter VI: References 42

Annexes 44

List of Tables

Table 4.1 Augmented Dickey-Fuller (ADF) unit root test with intercept only at level and first difference 26
Table 4.2 Phillips-Perron (PP) unit root test with intercept only at level and first difference 27
Table 4.3 Augmented Dickey-Fuller (ADF) unit root test with intercept and trend at level, and first difference 28
Table 4.4 Phillips-Perron (PP) unit root test with intercept and trend at level, and first difference 29
Table 4.5 Descriptive Statistics Macroeconomic Variables 31
Table 4.6 Correlation between the macroeconomic variables and RGDPR 32
Table 4.7 Optimum Lag Length of the VAR System 33
Table 4.8 ARDL Bound Test Result 34
Table 4.9 Long-run Coefficients 35
Table 4.10 Short-run Coefficients 35
Table 4.11 Pairwise Granger Causality Test 36

List of Figures

Figure 2.1 Theoretical Framework 22
Figure 4.1 Graph of the Variables 30
Figure 4.2 Plot of Cumulative Sum (CUSUM) of Recursive Residuals 38
Figure 4.3 Plot of Cumulative Sum of Squares (CUSUMQ) of Recursive Residuals 39
Figure 4.4 Jarque-Bera Test 39
Figure 4.5 Breusch-Godfrey Serial Correlation LM Test 39
Figure 4.6 Heteroskedasticity Test: Breusch-Pagan-Godfrey 40

Chapter I: Introduction

1.1 Background of the Study

Macroeconomic indicators serve as critical tools for assessing the overall health and efficiency of a nation's economy. These indicators provide valuable insights into economic performance and enable economists and policymakers to forecast future economic trends. Key macroeconomic indicators include real Gross Domestic Product (GDP), inflation rate, unemployment rate, exchange rate, and interest rate, among others. Each of these metrics offers a unique perspective on different aspects of economic activity, collectively contributing to a comprehensive understanding of the national economy's status and future direction.

Capital expenditure plays a crucial role in building the infrastructure necessary for economic activities, driving the economic growth of a nation. Capital expenditure includes investments in roads, education, health, and other public services that create public welfare. The relationship between capital expenditure and economic growth has been extensively debated, with various studies indicating both positive and negative outcomes depending on the efficiency and allocation of the expenditure.

Exports play a vital role in the economic development of countries by providing foreign exchange earnings, creating employment opportunities, and enabling access to a broader market. For developing countries like Nepal, export-led growth is seen as a strategic pathway to economic diversification and sustainable development. By exporting goods and services, Nepal can not only earn valuable foreign exchange but also enhance productivity through increased competition and innovation. This, in turn, can lead to higher economic growth rates, improved living standards, and poverty reduction. However, Nepal's export sector is characterized by a narrow range of products, predominantly agricultural and handicraft items, such as carpets, textiles, and tea.

Money supply is a key component of a country's monetary policy and plays a significant role in influencing economic activity. An increase in the money supply can lead to lower interest rates, which stimulates investment and consumption, thereby boosting economic growth. Conversely, a restrictive money supply can help control inflation but might also diminish economic activity. The challenge for policymakers is to find the right balance

between expanding the money supply to encourage growth and controlling it to prevent inflation. The Nepal Rastra Bank (NRB), central bank of Nepal, plays a crucial role in managing the money supply through various monetary policy tools, including open market operations, reserve requirements, and interest rate adjustments. The NRB's monetary policy aims to maintain price stability, support economic growth, and ensure financial stability. Understanding how changes in the money supply impact economic growth is essential for formulating effective monetary policies that can support sustainable economic development.

Inflation, a sustained increase in the general price level of goods and services in an economy over a period, affects economic activities by altering purchasing power, investment decisions, and saving behaviors. Moderate inflation is often considered beneficial as it can stimulate spending and investment, thus promoting economic growth. However, high and volatile inflation can lead to uncertainty, reducing consumer and business confidence, discouraging investment, and eroding the real value of savings. Therefore, understanding the optimal level of inflation that supports economic growth without causing adverse effects is critical for policymakers.

Nepal's economic growth has been a subject of considerable interest and debate among policymakers and researchers. Understanding the key drivers of economic growth is crucial for developing effective policies to promote sustainable development. Thus, this study aims to investigate the impact of capital expenditure, export, money supply, and inflation on economic growth in Nepal using the Autoregressive Distributed Lag approach.

1.2 Statement of the Problem

Nepal, a developing country in South Asia, faces numerous economic challenges, including low industrialization, limited infrastructure, and dependency on agriculture. Despite efforts to spur economic growth, Nepal's growth rates have been inconsistent, reflecting a need for more effective economic policies. To enhance economic growth, it is crucial to understand the key factors that drive it and how they interact. Among these factors, capital expenditure, exports, money supply, and inflation are considered critical variables that influence economic growth.

Capital expenditure, which involves government spending on infrastructure and development projects, is expected to stimulate economic growth by improving productivity and creating jobs. Similarly, exports are essential for earning foreign exchange, diversifying the economy, and promoting industrial growth. Meanwhile, the money supply influences economic activity by affecting interest rates, investment, and consumption. Finally, inflation impacts the purchasing power of consumers and the cost of doing business, thereby affecting economic growth.

However, the relationships between these factors and economic growth are complex and not fully understood in the context of Nepal. High inflation, for example, might erode purchasing power and deter investment, whereas a well-managed money supply could support growth. Excessive reliance on capital expenditure without efficient allocation could lead to fiscal imbalances. Similarly, while exports have the potential to drive growth, their actual impact depends on various conditions, including the regulatory environment, political stability, and infrastructure.

Given these complexities, there is a need to empirically investigate how capital expenditure, exports, money supply, and inflation collectively impact economic growth in Nepal. This research aims to fill this gap by employing an Autoregressive Distributed Lag (ARDL) approach to analyze the long-term and short-term relationships between these variables and economic growth. By doing so, the study seeks to provide a comprehensive understanding of the dynamics at play and offer insights that can guide policymakers in formulating strategies that promote sustainable economic growth in Nepal.

1.3 Objectives of the Study

The general objective of the study is to analyze capital expenditure, FDI, export, money supply and inflation on the economic growth of Nepal.

The specific objectives of the research are enumerated as follows:

i. To examine a long-run relationship among capital expenditure, export, money supply and inflation on the economic growth of Nepal.
ii. To investigate a short-run relationship among capital expenditure, export, money supply and inflation on the economic growth of Nepal.
iii. To examine the causality among capital expenditure, export, money supply and inflation on the economic growth of Nepal.

1.4 Research Questions and Hypotheses

The research questions of this study are as follows.

i. Do the four macroeconomic variables (capital expenditure, exports, broad money supply and inflation) share a long-run relationship with the economic growth of Nepal?
ii. Do the four macroeconomic variables (capital expenditure, exports, broad money supply and inflation) share a short-run relationship with the economic growth of Nepal?
iii. Do the four macroeconomic variables (capital expenditure, exports, broad money supply and inflation) share a causal relationship with the economic growth of Nepal? If they do, what is the direction of the causality between each of the macroeconomic variables and the economic growth of Nepal?

The study tests the following alternative hypotheses:

H_1: There is a significant long-run relationship between capital expenditure and the economic growth of Nepal.

H_2: There is a significant long-run relationship between exports and the economic growth of Nepal.

H_3: There is a significant long-run relationship between Broad Money Supply (M2) and the economic growth of Nepal.

H4: There is a significant long-run relationship between inflation and the economic growth of Nepal.

H_5: There is a significant short-run relationship between capital expenditure and the economic growth of Nepal.

H6: There is a significant short-run relationship between exports and the economic growth of Nepal.

H_7: There is a significant short-run relationship between Broad Money Supply (M2) and the economic growth of Nepal.

H_8: There is a significant short-run relationship between inflation and the economic growth of Nepal.

H_9: Capital expenditure Granger causes real GDP.

H_{10}: Real GDP Granger causes capital expenditure.

H_{11}: Exports Granger causes real GDP.

H_{12}: Real GDP Granger causes exports.

H_{13}: Inflation Granger causes real GDP.

H_{14}: Real GDP Granger causes inflation.

H_{15}: Broad money supply Granger causes real GDP.

H_{16}: Real GDP Granger causes broad money supply.

1.5 Rationale of the Study

This study's rationale lies in its potential to contribute to the understanding of how capital expenditure, exports, money supply, and inflation interact to influence economic growth in Nepal. By employing the Autoregressive Distributed Lag (ARDL) approach, the study provides a comprehensive analysis of both short-term and long-term effects. The findings offer valuable insights for policymakers, helping them design strategies that can effectively leverage these factors to promote sustainable economic growth.

In summary, this study is crucial for providing empirical evidence on the complex dynamics affecting Nepal's economic growth. The insights gained helps in formulating more effective economic policies and investment strategies, ultimately contributing to the country's development goals and improving the economic well-being of its population.

1.6 Limitations

The limitations of this study are as follows:

i. The research is limited to only secondary sources of data.
ii. There is time limitation for the researcher as the researcher has to complete the research within time frame for the internal research of NASC.
iii. The research is based on the annual time series data because of the unavailability of the quarterly or monthly data of all the variables being studied.
iv. The study is limited to the study of the selected macroeconomic variables only. There may be other macroeconomic variables that may impact the economic growth of Nepal.

Chapter II: Review of Literature

2.1 Empirical Review

The economic growth of a nation is influenced by various factors, including capital expenditure, exports, money supply, and inflation. Each of these variables plays a significant role in shaping the country's economic landscape, and their interactions can provide valuable insights into the country's overall economic performance. The empirical review of both national and international literature is presented as follows.

i. Empirical Review of International Literatures

Government expenditure stimulates the economic growth through budgetary expansion that ultimately boosts private sector spending. Bose et al. (2007) employed a panel of 30 developing countries over the 1970s and 1980s and found that the share of capital expenditure in GDP is positively associated with economic growth and the share of current expenditure does not have a strong correlation with economic growth. Ahuja and Pandit (2020) found a positive relationship between public expenditure and economic growth using the panel data for 59 countries covering the period from 1990 to 2019.

Exports are another critical component influencing economic growth. Feder (1983) analyzed the exports and economic growth of semi-industrialized less developed countries from the period 1964 to 1973 and found that economic growth can be achieved through the reallocation of existing resources to the higher productivity export sector from the less efficient non-export sector. Balassa (1978) investigated the relationship between exports and economic growth in a group of eleven developing countries with an industrial base and found that growth in exports favorably contributes to the economic growth of a nation. Fosu (1990) examined the exports and economic growth nexus using a pooled cross-sectional cum time series estimation of 28 African LDCs from 1960 to 1970 and found that export growth exerts a positive and a significant impact on the economic growth.

Dingela and Khobai (2017) analyzed the dynamic impact of broad money supply (m3) on economic growth (GDP) per capita in South Africa from 1980 to 2016 employing the autoregressive distributed lag (ARDL)-bounds testing approach to cointegration and error correction model to investigate the impact of m3 on GDP per capita. The study found that there is a significant positive association between money supply and

economic growth both in short run and long run (Dingela and Khobai, 2017). Doan (2020) investigated the relationship between money supply and inflation on the economic growth of Vietnam and China from 2012 to 2016 along with the economic theories of Fisher, Friedman and found that money supply and inflation are closely related, and the money supply directly affects economic growth.

Mallik and Chowdhury (2001) investigated the relationship between inflation and GDP growth of four South Asian countries (Bangladesh, India, Pakistan and Sri Lanka) using annual data collected from the IMF International Financial Statistics and found a long-run positive relationship between GDP growth rate and inflation for all four countries. There are also significant feedbacks between inflation and economic growth. Moderate inflation fosters economic growth while faster economic growth leads to inflation (Mallik and Chowdhury, 2001). Kasidi and Mwakanemela (2013) analyzed time series data from 1990 to 2011 to examine the impact of inflation on economic growth using correlation coefficient and co-integration technique and found that inflation has a negative impact on economic growth. Moreover, there was no long-run relationship between inflation and economic growth in Tanzania.

ii. Empirical Review of National Literatures

Capital expenditure is crucial for economic growth in Nepal. Studies indicate that government spending, particularly on capital projects, has a significant positive impact on economic growth. For instance, Ghimire et al. (2021) highlight that agricultural exports and capital expenditure are vital for enhancing real GDP in Nepal. Similarly, Mahara (2021) emphasizes the long-run positive relationship between capital expenditure and economic growth, suggesting that increased capital spending can stimulate economic activities. Furthermore, Kharel and Adhikari (2021) argue that effective mobilization of capital expenditure is essential for expanding development activities, which in turn fosters economic growth. These findings collectively underscore the importance of capital investment in driving economic growth in Nepal. Paudel (2023) examined the effect of disaggregated government expenditure on the economic growth of Nepal in order to identify the sector-specific public expenditure using Autoregressive distributed lag (ARDL) approach to cointegration for the data spanning from 1981 to 2020. The study found that both capital and current expenditures in aggregate forms did not contribute to economic growth (Paudel, 2023).

The relationship between exports and economic growth in Nepal has been explored

extensively. For example, Phaju (2023) highlighted a causal relationship between exports and economic growth, suggesting that enhancing international trade competitiveness can spur economic development. Additionally, Panta et al. (2022) found that while imports can stimulate growth in the short term, the long-term effects of exports are more pronounced, supporting the export-led growth hypothesis. This highlights the necessity for Nepal to focus on boosting its export capabilities to achieve sustainable economic growth.

The money supply is intricately linked to economic growth as well. Mahara (2021) reported a significant long-run relationship between money supply and economic growth, suggesting that effective monetary policy can enhance growth prospects (Mahara, 2021). Mahara (2020) emphasize the importance of managing money supply to stabilize the economy and promote growth. The findings suggest that a well-regulated money supply can facilitate investment and consumption, thereby driving economic growth.

Inflation, while often viewed negatively, can have a complex relationship with economic growth in Nepal. Sapkota (2023) suggests a positive effect of inflation on economic growth, indicating that moderate inflation may stimulate economic activities. However, other studies, highlight the importance of maintaining inflation within a certain threshold (around 6% to 6.4%) to avoid detrimental effects on growth (Karki et al., 2020; Timsina et al., 2017). This indicates that while some level of inflation may be beneficial, excessive inflation can hinder economic performance.

In conclusion, the review of the empirical literature suggests that each factor contributes uniquely to the economic growth of Nepal and their effective management is essential for fostering sustainable growth. However, existing empirical literatures fail to address the interplay between capital expenditure, FDI, exports, money supply, and inflation and their impact on the economic growth in Nepal.

2.3 Theoretical Framework

In the existing literature, many researchers have empirically researched about several macroeconomic variables that impact the economic growth of Nepal. The majority of the studies have included the macroeconomic variables such as inflation, export, capital expenditure, broad money supply and interest rate. The review of existing literature suggests there is a positive relationship between capital expenditure and

economic growth (Bose et al., 2007; Ahuja and Pandit, 2020; Mahara, 2021). Literatures also support that exports favorably contribute to the economic growth of a nation (Balassa, 1978; Fosu, 1990) Similarly, literatures highlight that there is a positive association between money supply and economic growth (Dingela and Khobai, 2017; Doan, 2020; Mahara, 2021). Finally, literatures highlight that there is a positive relationship between export and economic growth (Mallik and Chowdhury, 2001; Sapkota, 2023) as well as negative relationship between export and economic growth (Kasidi and Mwakanemela, 2013). Thus, based on the literature review, the conceptual framework of the study is presented as follows:

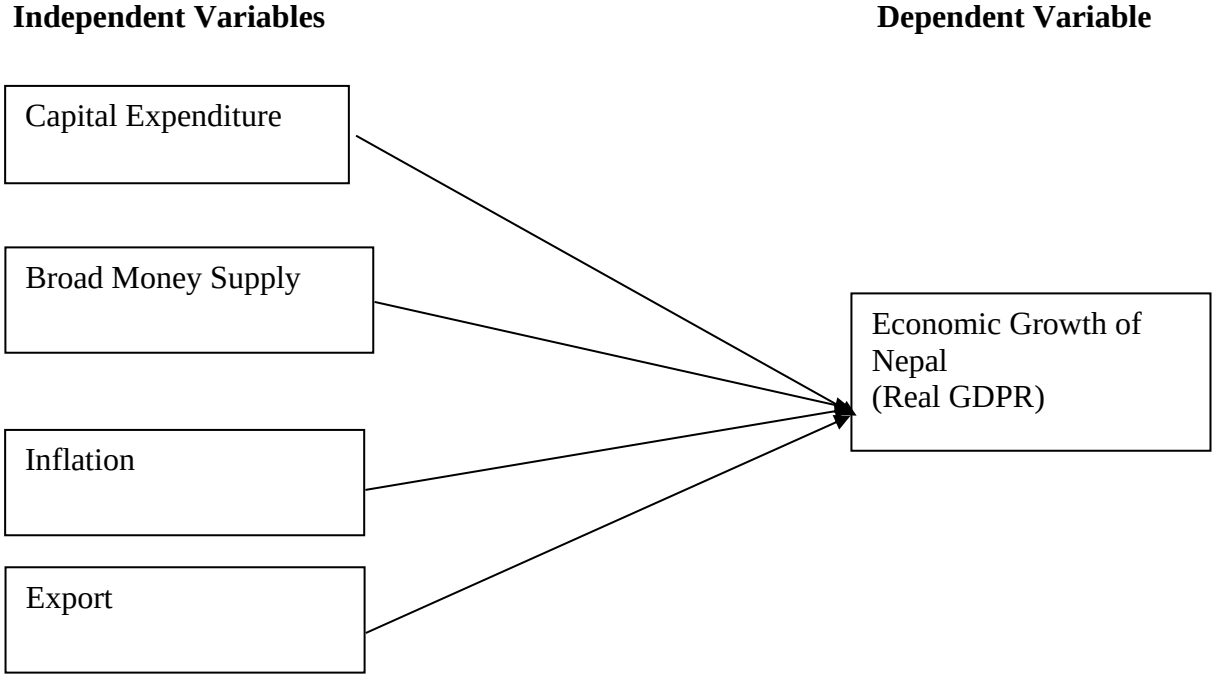


Figure 2.1 Theoretical Framework

Econometric Regression Model

The econometric regression model of the theoretical framework is presented as follows, wherein each variable is expressed into natural logarithm (log-log form or double log form) in order to measure the elasticity of dependent variable with respect to the percentage changes in independent variables.

$$LRGDPR_t = \beta_0 + \beta_1 LCAPEX_t + \beta_2 LMS_t + \beta_3 LINF_t + \beta_4 LEX_t + \varepsilon_t$$

Where,

$LRGDPR_t$ = Natural Logarithm of Real GDP growth rate at time t

$LCAPEX_t$ = Natural Logarithm of Capital Expenditure at time t

LMS_t = Natural Logarithm of Broad Money Supply at time t

$LINF_t$ = Natural Logarithm of Inflation at time t

LEX_t = Natural Logarithm of Export at time t

ε_t = Error Term at time t

Chapter III: Methodology

3.1 Research Design

This study employs descriptive research design in order to study the characteristics of the macroeconomic indicators of Nepal that influence the economic growth of Nepal. Moreover, causal comparative research design is used in order to study the causal relationships between the key macroeconomic indicators of Nepal and the economic growth of Nepal.

3.2 Data Sources

Data from the sample period are collected from the Macroeconomic Dashboard of Ministry of Finance, Government of Nepal.

3.3 Study Area

The target population of the study is related to the macroeconomic factors viz. capital expenditure, inflation, and money supply that influence the economic growth of Nepal.

3.4 Sampling

Convenience sampling method is used. The samples are taken from the secondary sources as per the convenience of the researcher. The yearly data of the dependent and independent variables are used as samples. The study period will range from 1974 to 2023.

3.5 Study Variables

The study variables are capital expenditure, inflation, broad money supply, export and real GDP, wherein, the dependent variable is real GDP and the independent variables are capital expenditure, inflation, broad money supply and export.

3.6 Data Collection and Management

- **Data Extraction**: Data are extracted from the Macroeconomic Dashboard the Ministry of Finance of the Government of Nepal.
- **Data Compilation**: The collected data are compiled into a structured database or spreadsheet format, such as Microsoft Excel, for easy analysis. Each variable are organized by year to facilitate time-series analysis.
- **Data Cleaning**: The data are checked for inconsistencies, missing values, and outliers. Any anomalies are addressed by cross-referencing with other data

sources or using statistical methods to handle missing data via interpolation technique.

- **Data Analysis:** The time series data is analyzed using the EViews (Econometric Views) software, which is a powerful statistical software package designed primarily for time-series oriented econometric analysis.

3.7 Ethical Considerations

- The research uses accurate reporting and analysis of the data, without altering or omitting any significant findings. The researcher will ensure that the data used are accurate and reliable.
- The researcher maintains transparency about the data sources, methodologies, and reports any limitations of the data.
- The researcher adheres to the ethical guidelines and standards set by the NASC research committee.

Chapter IV: Results and Discussions

4.1 Presentation of Results

The first step in the econometric analysis is to test the stationarity of the time series data because the econometric time-series data are largely non-stationary, and running a regression analysis on non-stationary data leads to a spurious regression problem. To test the stationarity of the time series data Augmented Dickey-Fuller (ADF) unit root and Phillips-Perron (PP) unit root tests are conducted at a level. If the given time-series data are non-stationary at a level, then the given time-series data are converted to the first difference to make them stationary.

Table 4.1 Augmented Dickey-Fuller (ADF) unit root test with intercept only at level and first difference

Variables	With intercept only				Order of Integration
	At Level		At First Difference		
	t-Statistics	Prob.	t-Statistics	Prob.	
LRGDPR	-6.5106*	0.0000*			I(0)
LCAPEX	-1.5325	0.5088	-5.4313*	0.0000*	I(1)
LMS	-1.2423	0.6483	-4.7930*	0.0003*	I(1)
LINF	-4.7735*	0.0003*			I(0)
LEX	-1.2975	0.6234	-5.8218*	0.0000*	I(1)
Critical Values					
1 %	-3.5847		-3.6056		
5%	-2.9281		-2.9369		
10%	-2.6022		-2.6068		

Note: *, **, and *** indicate significant at 1%, 5% and 10% degree of significance

Table 4.2 Phillips-Perron (PP) unit root test with intercept only at level and first difference

Variables	With intercept only				Order of Integration
	At Level		At First Difference		
	t-Statistics	Prob.	t-Statistics	Prob.	
LRGDPR	-6.5101*	0.0000*			I(0)
LCAPEX	-1.4743	0.5379	-5.3412*	0.0001*	I(1)
LMS	-1.4864	0.5319	-4.7930*	0.0003*	I(1)
LINF	-4.8778*	0.0002*			I(0)
LEX	-1.3053	0.6198	-5.7835*	0.0000*	I(1)
Critical Values					
1 %	-3.5847		-3.5924		
5%	-2.9281		-2.9314		
10%	-2.6022		-2.6039		

Note: *, **, and *** indicate significant at 1%, 5% and 10% degree of significance

Table 4.1 and Table 4.2 report the Augmented Dickey-Fuller (ADF) unit root test and Phillips-Perron (PP) unit root test with intercept only at a level and first difference respectively. As reported by Table 4.1 and 4.2, LRGDPR and LINF are stationary at the level since their probability values of the ADF test statistic as well as PP test statistic are less than the 5% level of significance, rejecting the null hypothesis that these individual variables have a unit-root i.e., is non-stationary. However, the variable LCAPEX, LMS and LEX are non-stationary or has a unit root at level, given that the probability of ADF test statistic as well as the PP test statistic is greater than 5% level of significance, which indicates that the null hypothesis that the variables have a unit root i.e., is non-stationary, is not rejected. Hence, these individual variables are converted to first difference in order to make them stationary. As reported by Table 4.1 and Table 4.2 the variables LCAPEX, LMS and LEX are stationary at first difference since their probability values of the ADF test statistic as well as PP test statistic are less than the 1% level of significance, rejecting the null hypothesis that these individual variables have a unit-root i.e., is non-stationary.

Table 4.3 Augmented Dickey-Fuller (ADF) unit root test with intercept and trend at level, and first difference

Variables	With intercept and trend				Order of Integration
	At Level		At First Difference		
	t-Statistics	Prob.	t-Statistics	Prob.	
LRGDPR	-6.5101*	0.0000*			I(0)
LCAPEX	-1.4743	0.5379	-5.3412*	0.0001*	I(1)
LMS	-1.4864	0.5319	-4.7930*	0.0003*	I(1)
LINF	-4.8779*	0.0002*			I(0)
LEX	-1.3053	0.6198	-5.7835*	0.0000*	I(1)
Critical Values					
1 %	-3.5847		-3.5925		
5%	-2.9281		-2.9314		
10%	-2.6022		-2.6039		

Note: *, **, and *** indicate significant at 1%, 5% and 10% degree of significance

Table 4.4 Phillips-Perron (PP) unit root test with intercept and trend at level, and first difference

Variables	With intercept and trend				Order of Integration
	At Level		At First Difference		
	t-Statistics	Prob.	t-Statistics	Prob.	
LRGDPR	-6.4807*	0.0000*			I(0)
LCAPEX	-2.4961	0.3287	-5.3371*	0.0004*	I(1)
LMS	-2.0425	0.5637	-4.9428*	0.0011*	I(1)
LINF	-5.1825*	0.0006*			I(0)
LEX	-1.2016	0.8988	-5.7655*	0.0001*	I(1)
Critical Values					
1 %	-4.3743		-4.3943		
5%	-3.6032		-3.6122		
10%	-3.2380		-3.2431		

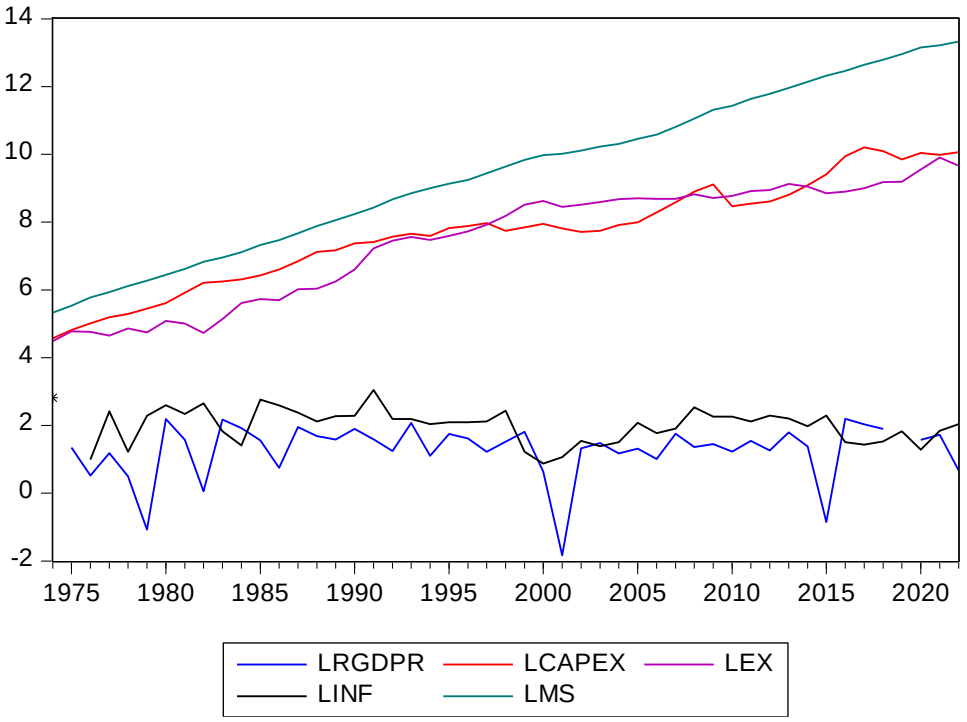
Note: *, **, and *** indicate significant at 1%, 5% and 10% degree of significance

Table 4.3 and Table 4.4 report the Augmented Dickey-Fuller (ADF) unit root test and Phillips-Perron (PP) unit root test with intercept and trend at a level and first difference respectively. As reported by Table 4.3 and 4.4, LRGDPR and LINF are stationary at the level since their probability values of the ADF test statistic as well as PP test statistic are less than the 5% level of significance, rejecting the null hypothesis that these individual variables have a unit-root i.e., is non-stationary. However, the variable LCAPEX, LMS and LEX are non-stationary or has a unit root at level, given that the probability of ADF test statistic as well as the PP test statistic is greater than 5% level of significance, which indicates that the null hypothesis that the variables have a unit root i.e., is non-stationary, is not rejected. Hence, these individual variables are converted to first difference in order to make them stationary. As reported by Table 4.3 and Table 4.4 the variables LCAPEX, LMS and LEX are stationary at first difference since their probability values of the ADF test statistic as well as PP test statistic are less than the 1% level of significance, rejecting the null hypothesis that these individual variables have a unit-root i.e., is non-stationary.

Since the order of integration of variables LRGDPR and LINF is I(0) and the order of integration of other variables LCAPEX, LMS and LEX is I(1), Autoregressive

Distributed Lag (ARDL) model is suitable for cointegration. ARDL cointegration is used when considered variables have different orders of integration that is some variables are stationary at level and some are stationary at first difference. For this purpose, ARDL cointegration or bound test is used. The Autoregressive (AR) component captures the short-term dynamics of the relationship between variables and the Distributed lag (DL) component captures the lagged effects of explanatory variables on the dependent variable. ARDL models can be used to separate short-run fluctuations from long-run equilibrium relationships

Figure 4.1 Graph of the Variables



4.2 Descriptive Analysis

Table 4.5 presents the descriptive statistics of the time series data containing RGDPR, CAPEX, MS, INF and EX variables at a level between the sample period spanning from 1974 to 2022. The central tendency of the data set is measured using mean, median, maximum and minimum values. Standard deviation, skewness, and kurtosis are used to measure of dispersion or variation. Finally, to test the normality of the data set Jarque-Bera test is used.

As it can be seen from the Table 4.5 below, the Real Gross Domestic Product Growth Rate (RGDPR) had a minimum value of -2.37 % and a maximum value of 8.98% over the sample period, with an average value of 4.19% and mid-value of 4.26%. Capital

Expenditure (CAPEX) had an average value of 24772.40 million rupees and it ranged from a minimum of 967.20 million rupees to a maximum of 270713.70 million rupees over the study period. Over the sample period, the broad money supply (MS) spanned from a minimum of 2064.40 million rupees to a maximum of 6130483 million rupees and the average value was 906740.10 million rupees. The inflation rate (INF) ranges from a minimum of -0.70% to a maximum of 21.10%, with an average value of 8.11% over the study period. Finally, export (EX) ranges from a minimum of 889.60 million rupees to a maximum of 200031 million, with an average value of 43852.80 million rupees during the study period.

Table 4.5 Descriptive Statistics of Macroeconomic Variables

	RGDPR	CAPEX	MS	INF	EX
Mean	4.19	5579.882	90674.01	8.11	4385.280
Median	4.26	2477.240	15280.01	8.10	3567.63
Maximum	8.98	27071.37	613048.3	21.10	20003.10
Minimum	-2.37	96.72000	206.4400	-0.70	88.96000
Std. Dev.	2.455521	7569.450	156863.2	4.12	4504.549
C.V.	58.61	135.66	173	50.80	102.72
Skewness	-0.187567	1.694227	2.031836	0.641980	1.280995
Kurtosis	3.011336	4.469216	6.118867	3.867227	4.819928
Jarque-Bera	0.287576	27.84879	53.57489	4.901295	20.16336
Probability	0.866071	0.000001	0.000000	0.086238	0.000042
Observations	49	49	49	49	49

As presented in Table 4.5, the coefficient of variation (CV) of MS (173.00%) and CAPEX (135.66%) have the highest CV, meaning they are highly volatile relative to their mean. EX (102.72%) is also quite volatile. RGDPR (58.61%) and INF (50.80%) are relatively more stable compared to the other variables. The positive values of the skewness for CAPEX,

INF, MS, and EX indicate that all these variables have a long right tail or is positively skewed, except the variable RGDPR which has a negative value of skewness, which means that it is negatively skewed. Similarly, since the kurtosis values of RGDPR, CAPEX, MS, INF, AND EX are all greater than 3, they have leptokurtic or peaked curve. Finally, the probability values of the Jarque-Bera test statistics of all the variables except RGDPR and INF are greater than 5 percent level of significance, meaning that the null hypothesis which hypothesizes that all the variables are normally distributed is not rejected. Thus, all the variables studied except the RGDPR and INF are normally distributed.

Table 4.6 Correlation between the macroeconomic variables and RGDPR

	LRGDPR	LCAPEX	LMS	LINF	LEX
LRGDPR	1.0000				
LCAPEX	0.1688	1.0000			
LMS	0.0999	0.9767	1.0000		
LINF	0.1220	-0.1722	-0.2205	1.0000	
LEX	0.0978	0.9295	0.9591	-0.2627	1.0000

Table 4.6 presents the Pearson correlation coefficients between the different bivariate variables. There is a weak positive relationship between LRGDPR and LCAPEX; and LRGDPR and LINF. There is a very weak positive relationship between LRGDPR and LMS; and LRGDPR and LEX. GDP growth is weakly influenced by capital expenditure, money supply, inflation, and exports. Inflation has a negative impact on capital expenditure, money supply, and exports, suggesting higher inflation discourages investment and trade.

4.3 Inferential Analysis and Discussion

The long-run equilibrium and short-run causality are analyzed among the LRGDPR and LCAPEX, LMS, LEX and LINF.

4.3.1 Long-Run Equilibrium Analysis

For the long-run equilibrium analysis Autoregressive Distributed Lag (ARDL) bound test is employed to determine whether a long-term relationship exists between multiple economic variables by testing for cointegration using the Autoregressive Distributed Lag

(ARDL) model, where the key component is the "bounds test" which helps identify if the relationship between variables is stable over time and not just a short-run fluctuation; essentially, it checks if the variables tend to return to a common equilibrium level in the long run. Similarly, ARDL cointegration is used when considered variables have different orders of integration that is some variables are stationary at level and some are stationary at first difference. For this purpose, ARDL cointegration or bound test is used. The Autoregressive (AR) component captures the short-term dynamics of the relationship between variables and the Distributed lag (DL) component captures the lagged effects of explanatory variables on the dependent variable. ARDL models can be used to separate short-run fluctuations from long-run equilibrium relationships.

As reported in Table 4.1, 4.2, 4.3 and 4.4, since the order of integration of variables LRGDPR and LINF is I(0) and the order of integration of other variables LCAPEX, LMS and LEX is I(1), Autoregressive Distributed Lag (ARDL) model is suitable for cointegration. The steps that are carried out for the long-run equilibrium analysis are as follows:

4.3.1.1 Selection of Optimum Lag Length Using VAR

The next step for establishing the long-run relationship among the selected variables is to determine the optimal lag length using the Vector Autoregressive (VAR) system. In order to select the optimum lag length using the VAR system, five different criteria are used, namely: sequential modified likelihood ratio (LR) test statistic, final prediction error criteria (FPE), Akaike information criterion (AIC), Schwarz information criterion (SIC), and Hannan-Quinn information criterion (HQ). Table 4.7 reports the results of these criteria. As reported by the FPE, AIC, SC, and HQ criterion in Table 4.7 the optimum lag of the VAR system is one lags.

Table 4.7 Optimum Lag Length of the VAR System

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-177.6670	NA	0.008052	9.367538	9.580815	9.444060
1	58.72052	400.0404*	1.60e-07*	-1.472847*	-0.193184*	-1.013715*
2	80.35076	31.05881	2.03e-07	-1.300039	1.046009	-0.458297
3	93.78197	15.84194	4.39e-07	-0.706768	2.705666	0.517584

* Indicates optimal lag order selected by the criterion.

LR: sequential modified LR test statistic (each test at 5% level),

FPE: Final prediction error,

AIC: Akaike information criterion,

SC: Schwarz information criterion,

HQ: Hannan-Quinn information criterion

4.3.1.2 Cointegration Test

The relationship among the selected variables is analyzed using the ARDL Bound Testing Approach. As reported by Table 4.8, the calculated F-statistics is beyond the upper bound of critical value at a 1 percent level of significance for the considered relationship by the study. It ensures the rejection of the null hypothesis of no cointegration. Thus, there is a long-run association among the selected variables.

Table 4.8 ARDL Bound Test Result

Dependent Variable (Independent Variables)	SBC (Schwarz Bayesian Criterion) lag length	F-statistic	Remarks
F_{LRGDPR}(LRGDPR | LCAPEX, LMS, LINF, LEX)	(1,1,1,1,1)	13.83296	Cointegration
F_{LCAPEX}(LCAPEX | LRGDPR, LMS, LINF, LEX)	(1,0,1,0,0)	1.859880	No Cointegration
F_{LMS}(LMS | LRGDPR, LCAPEX, LINF, LEX)	(1,0,1,1,0)	3.909979	No Cointegration
F_{LINF}(LINF | LRGDPR, LCAPEX, LMS, LEX)	(1,0,0,1,0)	5.913249	Cointegration
F_{LEX}(LEX | LRGDPR, LCAPEX, LMS, LINF)	(1,0,1,0,0)	6.607992	Cointegration
Critical Value Bounds	I(0)	I(1)	
10%	3.03	4.06	
5%	3.47	4.57	
1%	4.4	5.72	

4.3.1.3 ARDL Regression Results

As confirmed by the Table 4.8 ARDL Bound Test results equation 1, there exists a long-run relationship or cointegration between the LRGDPR and LCAPEX, LMS, LINF, and LEX. Now, the long-run as well as short-run relationships among the variables is estimated as

follows based on the SBC criteria.

Long-run Coefficients

Table 4.9 presents the long-run coefficients of the cointegrating equation 1. As reported by Table 4.9, there exists a long-run relationship between LRGDPR and the macroeconomic variables: LCAPEX, LEX, LMS and LINF. There is a non-significant positive long-run relationship between LRGDPR and LCAPEX and LINF. Meanwhile, there is a non-significant negative long-run relationship between LRGDPR and LEX and LINF. The cointegration analysis is analyzed by assuming that there exists a linear trend in the ARDL model and the cointegrating relationship only has an intercept or a constant.

Table 4.9 Long-run Coefficients

Levels Equation Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCAPEX	0.280858	0.364459	0.770616	0.4463
LEX	-0.087331	0.223527	-0.390694	0.6985
LMS	-0.020557	0.291458	-0.070530	0.9442
LINF	0.299161	0.307060	0.974274	0.3368
EC = LRGDPR - (0.2809*LCAPEX -0.0873*LEX -0.0206*LMS + 0.2992*LINF)				

Short-run Coefficients

Table 4.10 Short-run Coefficients

ECM Regression Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.256795	0.397787	-3.159468	0.0033
D(LCAPEX)	0.744076	0.604559	1.230775	0.2269
D(LEX)	2.521663	0.543304	4.641346	0.0000*
D(LMS)	1.365064	2.402558	0.568171	0.5737
D(LINF)	0.087308	0.183910	0.474733	0.6380
CointEq(-1)$^{+}$	-1.099416	0.125045	-8.792147	0.0000*
R-squared	0.741871	Mean dependent var		0.010507
Adjusted R-squared	0.707906	S.D. dependent var		1.188831
S.E. of regression	0.642512	Akaike info criterion		2.079262
Sum squared resid	15.68723	Schwarz criterion		2.322560
Log likelihood	-39.74376	Hannan-Quinn criteria		2.169489
F-statistic	21.84261	Durbin-Watson stat		1.951919
Prob(F-statistic)	0.000000			

*, **, and *** represent significance at 1%, 5% and 10%; $^{+}$ p-value incompatible with t-Bounds distribution.

Table 4.10 reports the ECM regression results. There is a statistically significant positive relationship between LRGDPR and LEX in the short-run. Similarly, there exists a non significant positive relationship between LRGDPR and LCAPEX, LMS

and LINF in the short-run. The statistically significant and negative ECM term reconfirms the existence of co-integration among the variables under study. The ECM coefficient is about -1.01 and suggests that the readjustment for any deviations in the long-run equilibrium due to short-run disturbances are corrected by 101% percent per year to restore the long-run equilibrium among the macroeconomic variables. In general, the value of the ECM coefficient lies between -0.01 to -1 but Loyaza and Ranciere (2006) have highlighted that ECM coefficient term be negative and not lower than -2.

The coefficient of determination or the R-squared of the ECM regression is 74.19% which means that 74.19% variations in dependent variable LRGDPR is explained by the independent variables LCAPEX, LINF, LMS and LEX jointly. The other 25.81% is determined by the other random stochastic variables that are not considered by the model. Since R-squared measures how closely the data are fitted to the regression line, with R-squared of 74.19% we can conclude that there is a good fitness of the data in the model. Unlike the R-squared which increases every time we introduce a new independent variable in the model, the adjusted R-squared adjusts based on the number of independent variables in the model and increases only when the introduced variables increase the overall model fit. The adjusted R-squared of the cointegrated equation is 70.79% which indicates that there is good fitness of the data in the model even when new variables are introduced into it. Moreover, the probability of the F-statistic which is 0.0000 is less than 5 percent level of significance which implies that the overall model is significant or the overall model fits the data better than the model with no independent variables or intercept only model.

Short-Run Causality Test

Table 4.11 Pairwise Granger Causality Test

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LCAPEX does not Granger Cause LRGDPR	45	0.98432	0.3268
LRGDPR does not Granger Cause LCAPEX		0.00105	0.9743
LEX does not Granger Cause LRGDPR	45	0.01652	0.8984
LRGDPR does not Granger Cause LEX		0.00636	0.9368
LINF does not Granger Cause LRGDPR	44	5.39019	0.0253*
LRGDPR does not Granger Cause LINF		0.05364	0.8180
LMS does not Granger Cause LRGDPR	45	0.30691	0.5825
LRGDPR does not Granger Cause LMS		3.28097	0.0772**
LEX does not Granger Cause LCAPEX	48	0.09472	0.7597
LCAPEX does not Granger Cause LEX		3.97326	0.0523**

LINF does not Granger Cause LCAPEX	46	1.79291	0.1876
LCAPEX does not Granger Cause LINF		2.82438	0.1001**
LMS does not Granger Cause LCAPEX	48	3.37966	0.0726**
LCAPEX does not Granger Cause LMS		0.67311	0.4163
LINF does not Granger Cause LEX	46	1.33027	0.2551
LEX does not Granger Cause LINF		3.86596	0.0558**
LMS does not Granger Cause LEX	48	1.07055	0.3063
LEX does not Granger Cause LMS		0.62870	0.4320
LMS does not Granger Cause LINF	46	3.38565	0.0727**
LINF does not Granger Cause LMS		13.3914	0.0007*

*, **, and *** indicate significant at 1%, 5% and 10% level of significance respectively

Table 4.11 presents the results of the pairwise Granger causality test. LINF causes LRGDPR as the probability of the F-statistic is less than 5 percent level of significance implying the rejection of null hypothesis. But LRGDPR does not Granger causes LINF. Moreover, LRGDPR causes LMS as the probability of the F-statistic is less than 10 percent level of significance implying the rejection of the null hypothesis, but LMS does not Granger causes LRGDPR.

Similarly, LCAPEX causes LEX at 10% degree of significance, but LEX does not Granger causes LCAPEX. LCAPEX causes LINF at 10% degree of significance, but LINF does not Granger cause LCAPEX. LMS causes LCAPEX at 10% degree of significance, but LCAPEX does not Granger causes LMS. LEX causes LINF at 10% degree of significance but LINF does not Granger cause LEX. LMS causes LINF at 10% degree of significance and LINF causes LMS at 5% degree of significance. Thus, there is a bi-directional causality or feedback relationship between LMS and LINF.

However, there is no causality between LRGDPR and LCAPEX, LRGDPR and LEX, and LMS and LEX as the probability of the F-statistic is greater than 5 percent level of significance implying the null hypotheses.

Diagnostic Tests

Stability Test of the ARDL Model

The stability diagnostic tests were performed to assess the structural stability of the estimated model parameters using the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) tests based on recursive residuals. These tests evaluate whether the model parameters remain stable over time. Under the null hypothesis, parameter stability is assumed. If the test statistics fall outside the critical bounds at the 5% significance level, the

null hypothesis is rejected, indicating a possible structural break in the model. The CUSUM test is designed to detect gradual, systematic changes in the parameters, while the CUSUMSQ test is more effective in identifying sudden shifts. The results of these tests provide insight into the reliability of the model over the sample period.

Figure 4.2 Plot of Cumulative Sum (CUSUM) of Recursive Residuals

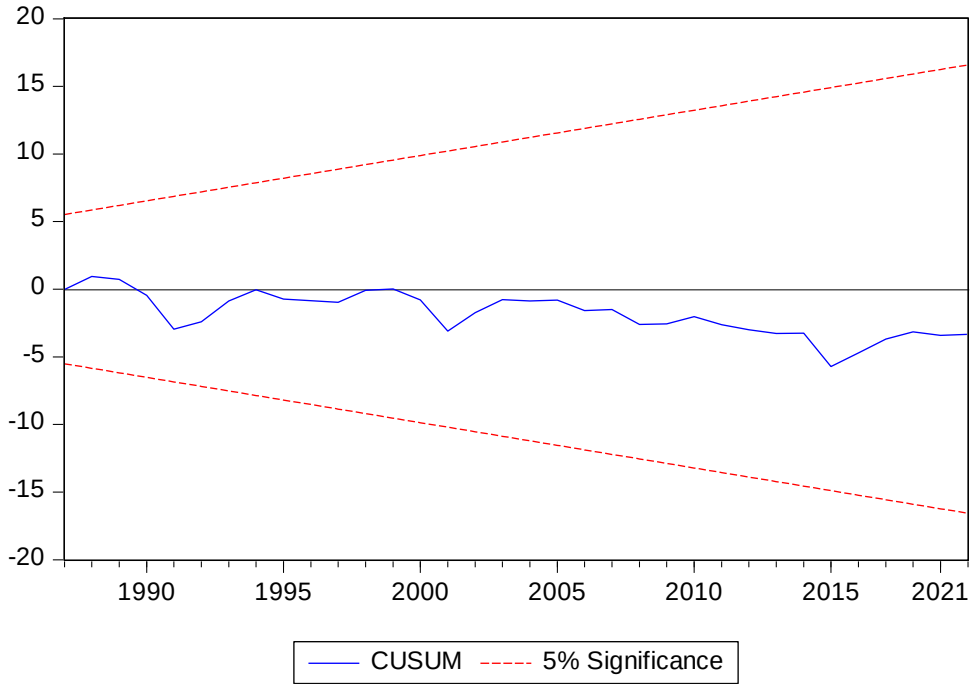
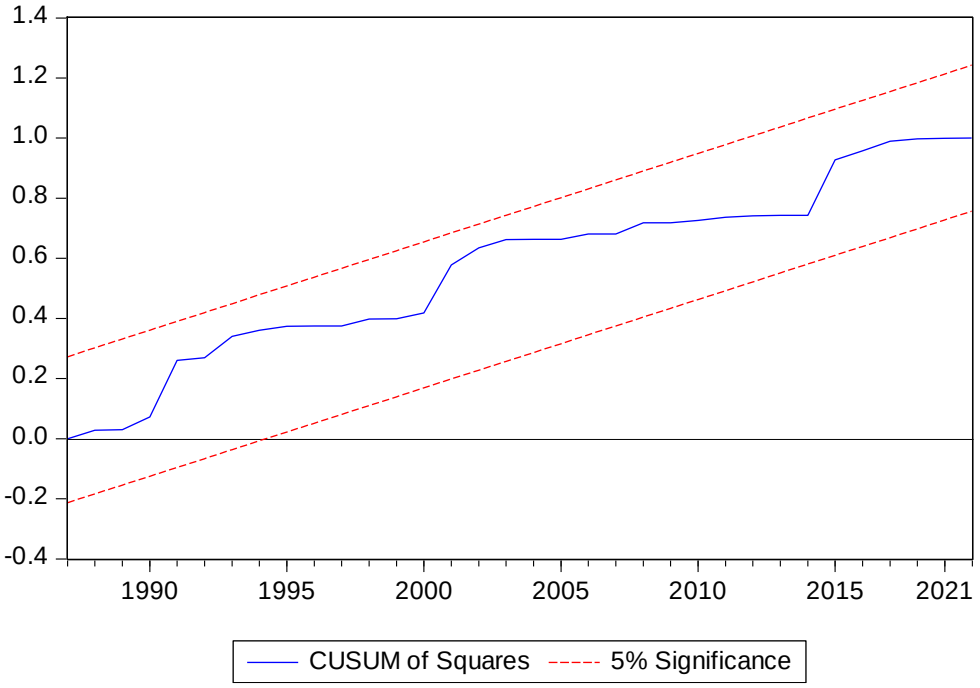


Figure 4.2 presents the plot of Cumulative Sum (CUSUM) of recursive residuals and figure 4.3 presents the plot of Cumulative Sum of Squares (CUSUMQ) of recursive residuals. The plots of the CUSUM and CUSUMSQ lines lie within the 5% critical bounds, indicating that the model is stable and robust.

Figure 4.3 Plot of Cumulative Sum of Squares (CUSUMQ) of Recursive Residuals



Residual Normality Test (Jarque-Bera Test)

Figure 4.4 Jarque-Bera Test

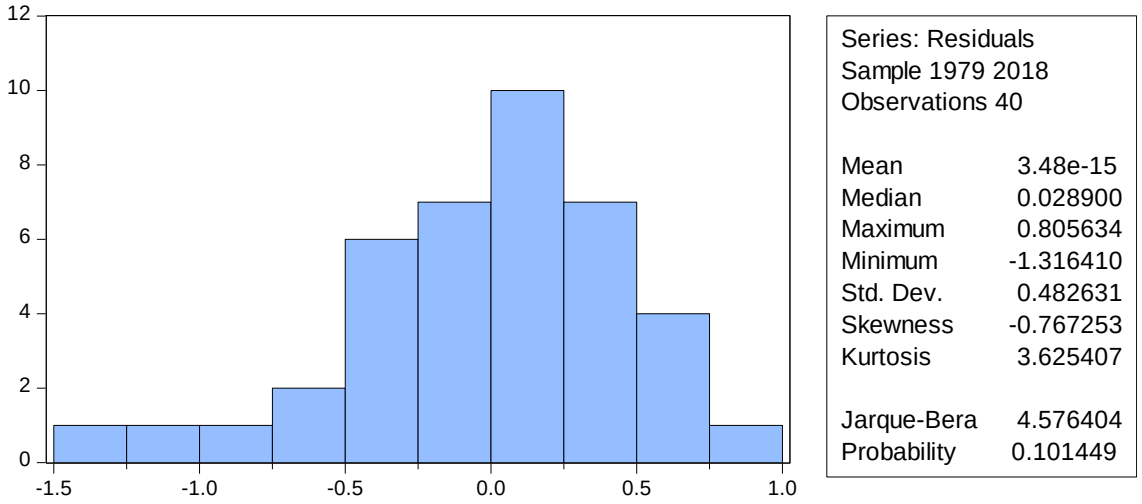


Figure 4.4 presents the Jarque-Bera test. The Jarque-Bera Statistic is 4.576404 and the p-value is 0.101449, which is greater than 0.05, indicating that the residuals are normally distributed.

Breusch-Godfrey Serial Correlation LM Test

Figure 4.5 Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.175912	Prob. F(2,23)	0.8398
Obs*R-squared	0.602648	Prob. Chi-Square(2)	0.7398

Figure 4.5 presents the Breusch-Godfrey Serial Correlation LM Test. Since both p-values (0.8398 and 0.7398) are greater than 0.05, we fail to reject the null hypothesis, meaning there

is no significant serial correlation in our residuals.

Heteroskedasticity Test

Figure 4.6 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.118672	Prob. F(14,25)	0.3896
Obs*R-squared	15.40666	Prob. Chi-Square(14)	0.3509
Scaled explained SS	7.900148	Prob. Chi-Square(14)	0.8945

Figure 4.5 presents Breusch-Pagan-Godfrey's heteroskedasticity test. Since all p-values are greater than 0.05**,** we fail to reject the null hypothesis**.** This means there is no evidence of heteroskedasticity, and the model satisfies the homoskedasticity assumption.

Hence, the model passes the residual tests, indicating that the regression model is well-specified and satisfies key econometric assumptions. The model is free from the issues of normality, serial correlation and heteroskedasticity.

Chapter V: Conclusion

The study empirically investigated the relationship between capital expenditure, money supply, inflation, export, and economic growth in Nepal using the annual time series data from 1974 to 2023, applying the ARDL to co-integration approach. Based on the empirical results, there exists a long-run relationship between economic growth rate and the macroeconomic variables: capital expenditure, export, money supply and inflation. There is a non-significant positive long-run relationship between economic growth rate and capital expenditure and inflation. Meanwhile, there is a non-significant negative long-run relationship between economic growth rate, and exports and inflation. There is a statistically significant relationship between economic growth rate and exports in the short-run. Similarly, there exists a non-significant positive relationship between economic growth rate and capital expenditure, money supply and inflation in the short-run. Inflation causes economic growth, economic growth causes money supply; however, there is no causality between economic growth rate and capital expenditure, and economic growth rate and exports.

Overall, the findings suggest that while exports significantly influence economic growth in the short run, other macroeconomic variables lack robust effects both in the short and long term. Policymakers should prioritize export-driven strategies to stimulate short-run growth while considering structural reforms to strengthen the long-run impact of capital expenditure and monetary variables on economic development.

Chapter VI: References

Ahuja, D., & Pandit, D. (2020). Public expenditure and economic growth: Evidence from the developing countries. *FIIB Business Review*, *9*(3), 228-236.

Balassa, B. (1978). Exports and economic growth: further evidence. *Journal of development Economics*, *5*(2), 181-189.

Bose, N., Haque, M. E., & Osborn, D. R. (2007). Public expenditure and economic growth: A disaggregated analysis for developing countries. *The Manchester School*, *75*(5), 533-556.

Dingela, S., & Khobai, H. (2017). Dynamic impact of money supply on economic growth in South Africa. An ARDL approach.

Doan Van, D. (2020). Money supply and inflation impact on economic growth. *Journal of Financial Economic Policy*, *12*(1), 121-136.

Feder, G. (1983). On exports and economic growth. *Journal of development economics*, *12*(1-2), 59-73.

Fosu, A. K. (1990). Exports and economic growth: the African case. *World Development*, *18*(6), 831-835.

Ghimire, A., Weiwei, F., & Zhuang, P. (2021). Does agricultural export promote nepalese economic growth? ARDL approach using structural break. In *E3S Web of Conferences* (Vol. 275, p. 01024). EDP Sciences.

Karki, S., Banjara, S., & Dumre, A. (2020). A review on impact of inflation on economic growth in Nepal. *Archives of Agriculture and Environmental Science*, *5*(4), 576-582.

Kasidi, F., & Mwakanemela, K. (2013). Impact of inflation on economic growth: A case study of Tanzania. *Asian Journal of empirical research*, *3*(4), 363-380.

Kharel, K. R., & Adhikari, D. B. (2021). Economic impact of government expenditure on economic growth of Nepal. *Interdisciplinary Journal of Management and Social Sciences*, *2*(2), 50-58. https://doi.org/10.3126/ijmss.v2i2.42601

Loayza, N. V., & Rancière, R. (2006). Financial Development, Financial Fragility, and Growth. *Journal of Money, Credit and Banking*, *38*(4), 1051–1076. http://www.jstor.org/stable/3838993

Mahara, T. (2020). Money supply-economic growth nexus: evidence from a landlocked country. *Quest Journal of Management and Social Sciences*, 2(1), 106-115. https://doi.org/10.3126/qjmss.v2i1.29026

Mahara, T. (2021). An empirical investigation between money supply, inflation, capital expenditure and economic growth in nepal. *Quest Journal of Management and Social Sciences*, 3(1), 23-39. https://doi.org/10.3126/qjmss.v3i1.37588

Mallik, G., & Chowdhury, A. (2001). Inflation and economic growth: evidence from four south Asian countries. *Asia-Pacific development journal*, *8*(1), 123-135.

Panta, H., Devkota, M., & Banjade, D. (2022). Exports and imports-led growth: evidence from a small developing economy. *Journal of Risk and Financial Management*, 15(1), 11. https://doi.org/10.3390/jrfm15010011

Phaju, R. (2023). Causal Relationship among Exports, Imports and Economic Growth in Nepal: Evidence from VAR Model. *Khwopa Journal*, 11-24. https://doi.org/10.3126/kjour.v5i1.53292

Paudel, R. C. (2023). Capital expenditure and economic growth: A disaggregated analysis for Nepal. *Cogent Economics & Finance*, *11*(1), 2191449.

Sapkota, P. (2023). Effects of public debt on economic growth of nepal. *The Lumbini Journal of Business and Economics*, 11(1), 343-362. https://doi.org/10.3126/ljbe.v11i1.54340

Timsina, N., Panta, R., Dangal, M., & Chaulagain, M. (2017). Optimal inflation rate for Nepal. NRB Economic Review, 29(1), 1-18. https://doi.org/10.3126/nrber.v29i1.52519

Annexes

Nepal Administrative Staff College

Research and Consulting Services Department

Centre for Research and Development

Comment-Address Sheet for Internal Research Report, FY 2081/82

Research Title:	Assessing the Impact of Capital Expenditure, Export, Money Supply and Inflation on Economic Growth in Nepal: An ARDL Approach
Research Team Member(s):	Krishna Bahadur Thapa
Date of Evaluation:	29 Jestha 2082 (Thursday)

Evaluator's name: Shree Krishna Shrestha		
SN	**Comments**	**Actions taken**
1.	Include the relationship between the dependent and independent variables before presenting theoretical framework	The relationship between the dependent and independent variables has been incorporate before the theoretical framework.
2.		
3.		
4.		
5.		
6.		
7.		

Evaluator's name: Hari Prasad Dhungana		
SN	**Comments**	**Actions taken**
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Evaluator's name: Prakash C. Bhattarai		
SN	**Comments**	**Actions taken**
1.	Present implications for policy makers	The implications for the policy makers has been incorporated
2.		
3.		
4.		
5.		
6.		
7.		

Evaluator's name: Dr. Rajan Khanal		
SN	**Comments**	**Actions taken**
1.	It will be better to add import as well as a variable	Will study the impact of import as well in further research
2.		

Evaluator's name: Dr. Rajan Khanal		
SN	**Comments**	**Actions taken**
3.		
4.		
5.		

Evaluator's name: Bishnu Prasad Lamsal		
SN	**Comments**	**Actions taken**
1.	It will be better to add import as well as a variable	Will study the impact of import as well in further research
2.		
3.		
4.		
5.		

Remarks (if any):

-
-
-