DETERMINANTS OF INFLATION IN NEPAL

A Thesis

By

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RECOMMENDATION LETTER

It is certified that thesis entitled **"DETERMINANTS OF INFLATION IN NEPAL"** submitted by **Nanda Joshi** is an original piece of research work carried out by the candidate under my supervision. Literary presentation is satisfactory and the thesis is in a form suitable for publication. Work evinces the capacity of the candidate for critical examination and independent judgment. The thesis is forwarded for examination.

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CERTIFICATE OF AUTHORSHIP

I certified that the work in thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certified that the thesis has been written by myself. Any help that I have received in my research work and preparation of the thesis itself has been acknowledged. In addition, I certified that all information sources and literature used are indicated in the reference in section of the thesis.

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Nanda Joshi

Date: December 2019

APPROVAL SHEET

We, the undersigned, have examined the thesis entitled **"DETERMINANTS OF INFLATION IN NEPAL"** presented by **Nanda Joshi** a candidate for the degree of **Master of Business Studies** (MBS) and conducted the viva voce examination of the candidate. We hereby certify that the thesis is worthy of acceptance.

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ABSTRACT

This study analyses the impact of selected macro variable on inflation and examining the relationship between inflation rate and selected macro variables. Generally, both fiscal and monetary policies seek at achieving relative macroeconomic stability through maintaining stable prices or low and stable inflation. In the light of this, this study empirically investigates the impact of some macro variable on inflation in Nepal with the use of econometric technique multiple regression, correlation and trend analysis using time series data from 2001 to 2018. The annual data is collected from Nepal Rastra Bank and web site of World Bank. The result revealed that money supply is positively correlated with inflation, but the result is however insignificant in the case of GDP growth rate and to determine the inflation rate in context of Nepal. The regression analysis indicates that 85.9% of inflation rate is determined by exchange rate, money supply, GDP, per capita income and inflation rate of India, rest in 14.1% inflation rate is determined by other factors. The study found that there is positive correlation between exchange rate and inflation rate, money supply and inflation, per capita income and inflation rate and Indian inflation and inflation rate of Nepal. But study also revealed that insignificant negative correlation between GDP and inflation rate of Nepal. The exchange rate, money supply and Indian inflation are significant with inflation but GDP and per capita income are insignificant with inflation over the time period under study. There is only the monetary policy is not capable to control inflation, the fiscal measure are highly effective to controlling government expenditure, personal expenditure and private & public investment. The study therefore recommends that the central bank of Nepal need to deal with monetary and fiscal policy in more transparent manner so as to address the issue of inflation in Nepal.

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ABBREVIATIONS

CPE	Centrally Planned Economy
CPI	Consumer Price Index
CRR	Cash Reserve Ratio
GDP	Gross Domestic Product
HBS	Household Budget Survey
M_2	Money supply
NRB	Nepal Rastra Bank
OLS	Ordinary Least Square
QTM	Quantity Theory of Money
SLR	Statutory Liquidity Ratio
UK	United Kingdom
VAR	Vector Auto Regression
VIF	Variance Inflation Factor

CHAPTER – ONE

INTRODUCTION

1.1 Background of the Study

Inflation refers to a persistent and appreciable rise in price level over a period. Inflation can be defined as the persistent rise in the general price level across the economy over time. Inflation is an increase in the volume of money and credit relative to available goods resulting in a substantial and continuing rise in the general price level. High inflation is more likely to raise unemployment than to lower it (Friedman, 1977). More specifically, it hurts the poorest of the poor having fixed level of income, as inflation erodes their real wealth. In other words, it further widens the income inequality in society. According to Keynes, “inflation” can be applied to an underdeveloped country where unemployment of means and resources exist side by side with inflationary rise in prices. This is due to the existence of bottlenecks, such as limited amount of capital, machinery, transport facilities and absence of technical know-how. As a result of these bottlenecks and shortages, a rise in the price level may not lead to increase output beyond a certain stage, even though the country may not have reached the stage of full employment. Shapiro (2010) defines inflation as a rising price level. If such a rise in price level persist for long it is known as inflation. Consumer price index, gross domestic product deflator and other several indices measure the changes in price level.

Jalali (2011) defines inflation as a progressive rise in price level, usually over a period of time. Inflation is caused by continuous increase in the supply of money, a progressive decrease for money or both. The quantity theory of money explained that increasing quantity of money supply would lead to almost equal percentage of the increase in price of commodities. The theory asserts that general changes in price are primarily caused by changes in the money in circulation (Ricardo, 1817). The Keynesian theory on the other hand states savings have no positive effect on investment as long as the economy suffers under employment Keynes explained that an increase in the general price level or inflation is created caused by an increase in aggregate demand which is above the aggregate supply. Monetary theory advocates for the idea that market to regulate itself through market efficiency and reject most of

government intervention. Monetarist argues that an increase in money supply will only lead to increase in output or production and employment levels in the short run and not in the long run.

Consequently, the effectiveness of monetary policy in timing inflationary trends in under developing economics such as Nepalese economy has been in doubt although appreciable progress has been made in this regard since the introduction of various financial sector reform program in 1986. The main objective of monetary policy in Nepal is price stability and control inflation. The fixed exchange rate of India and budget deficit is the main problem of inflation in Nepal. Inflation is price increase of product or services in market in abnormal way. It creates great depression in the economy. Paudyal (2011) stated that the main determinants of inflation were budget deficit, board money supply, Indian prices, exchange rate and real GDP (gross domestic product). This result suggests that these factors were the main determinant of inflation in Nepal.

Inflation depreciates domestic currency value and imports become more expensive which further push up the domestic prices. In short, inflation is a burning issue in the macroeconomics. The main objective and function of central bank is to control inflation. In case of Nepal inflation has increased persistently over the years. It has increased by little over twenty-six times (from 6.8 to 178.8) during 1975 to 2018. This means the purchasing power of the Nepalese rupee has decreased in the same speed. The impact of rising prices on the real sector is stylized fact. It constrains the rise of per capita real GDP and thereby reduces the standard of livings of the common people in the country. The stationary price level has been one of success parameters of the government. However, it has been a Herculean task to achieve in developing countries. In case of Nepal, however, there appear some positive signals in slowing down the speed of price rise in the later years. Chaudhary (2018) was considered broad money supply, real GDP, Indian prices. The study indicates board money supply and exchange rate is significant and positive with inflation rate.

Measurement of prices in Nepal was began from 1973 using the expenditure weightage of the goods and services of the people obtained from first household budget survey (HBS). Consumer price index (CPI) in 1975 is 6.8 and 178.8 in 2018. It means price of goods and services are increase in same way. Due to the fixed

exchange rate between India and Nepal it affects the inflation or CPI in Nepal. Devaluation of Indian currency and increase price of product in Indian market directly affect the Nepalese consumer price index.

1.2 Statement of Problem and Research Question

The Nepalese economy has experienced inflationary pressures over the years. Inflation has been an elusive factor that has characterized our every existence as an independent nation. The macro variable has been geared towards attaining macroeconomic stability of the economy. The main objective of monetary policy is to maintain balance of payment, price stability, exchange rate stability and control inflation in Nepal (NRB, economic review 2006). Different report and newspaper shows more than 500 peoples are go outside the country in a day only for labor visa. It is the great issue of Nepal, due to export of energetic youth people outside of country it create great problem in near future. Ricardo (1817) study revealed that in the short run expansionary monetary policies will lead to a decrease in the natural rate of unemployment and increase the production but the effectiveness of expansionary policies will be inhabited in the long run because they lead to increase in inflation.

A study for NRB notes that Indian prices have a significant bearing on variation of domestic prices level in the country (NRB, 1994:100). Besides, they find that an increase in money stock causes price rise and the gradual depreciation of the exchange rate of domestic currency has been partly responsible for the price rise in Nepal. Pahlavani & Rahimi (2009) states that inflation in Iran is largely determined by money supply, exchange rate, GDP, expected inflation rate and imported inflation along with dummy variable. Kumar (2013) found that money supply and imports index is the most important variables in explaining inflation in India. A study by Neupane (1992) stated that one year lagged money supply, cost of holding real balances, budget deficits, low output growth rates and import prices are the important determinants of price inflation in Nepal. Mohamed (2016) study assessed the impact of money supply, exchange rate, gross domestic product, and budget deficit and government expenditure on inflation. The results shows that several monetary, fiscal and structural factors, namely, money supply, budget deficit and shrinking of gross domestic product are simultaneously influencing inflation in Sudan. While exchange rate and government expenditure are found to be with no effect on inflation rate, these

findings may explain the fact that inflation depends on the way government expenditure is financed rather than the magnitude of the expenditure itself.

Honore (2018) examined the nature of the relationship between the supply of money and inflation in Cameroon. Study reveals that monetary policy has positive and significant effect on inflation in Cameroon. Jesse in Nigeria found the monetary policy rate and economic growth rate impact positively in inflation and board money supply and exchange rate impact negatively in inflation in Nigeria. Bayo (2011) on the study for Nigeria reveals that fiscal deficits, money supply, interest and exchange rates are cause of inflation in Nigeria during the period under review. Paudyal (2013) found that variables such as budget deficits, Indian prices, broad money supply, exchange rate and real GDP influence inflation in Nepal. The study of 21st international economic conference (2014) in Romania, there is an inverse statistically significant relation between the inflation rate and the unemployment rate. This indicates that the inflation rate is an effective instrument in preventing the increase of in unemployment.

Salam (2016) applying ordinary least squares and indicated that, the money supply and the lagged rate of interest affect inflation positively and significantly; the lagged money supply and lagged budget deficit have a negative and significant effect on the rate of inflation. Different variables were used in different time and situation in different economy. Nepal is small and under developing nation, to improve economic situation of the economy effective use of monetary policy is most important phenomenon. External economic shocks are the cause of inflation fluctuates in aggregate macroeconomic level. Containing inflation has a far reaching impact on various sector of the economy. To achieve goal of monetary policy (price stability and control inflation) central bank of economy or regulatory authority use monetary tools. The central bank of Nepal(NRB) as a strong player in public finance, acting as a lender of last resort as well as having a strong influence on monetary and credit condition of the economy. The key concern of finance discipline is focused on how macro variables are transmitted financial market to business and household to the economy to achieve price stability based on the effective use of the economic policy to control inflation.

The study therefore deals with the following issues:

1) What is the trend of selected determinants of inflation in Nepal?
2) What is the relationship between selected macro variables and inflation in Nepal?
3) What is the impact of selected macro variables on inflation rate in Nepal?

1.3 Purpose of the Study

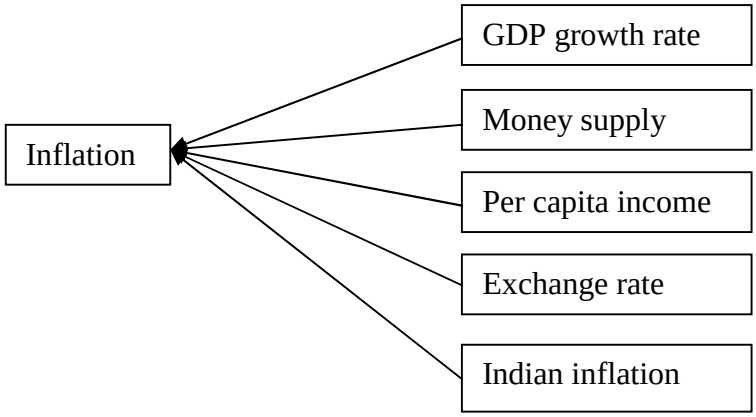
The general purpose of this study is to analyze the impact of selected macro variables on inflation in Nepal.

The specific objectives are as follows:

1) To analyze the trend of selected determinants of inflation in Nepal.
2) To examine the relationship between selected macro variable and inflation in Nepal.
3) To analyze the impact of selected macro variables on inflation in Nepal.

1.4 Conceptual Framework

This study will use different types of variables e.g. Dependent variable and Independent variable. Dependent variable for this study will inflation and independent variables are real GDP growth rate, money supply (M2) growth rate, exchange rate, and per capita income and Indian Inflation rate.



1.5 Significance of the Study

Macroeconomic instability frustrates the efforts of the private sector, depresses investment and exacerbates income inequity in the economy. This Study will help

effective use of macroeconomic variable, price stability and control inflation. This study will help following scholars and authority of the economy.

I. This study will be contributed to the achievement of macroeconomic goal of the economy.
II. This study will help to formulate macroeconomic policy of economy and easy to examine what factor of macroeconomic policy most influence to control inflation of the country.
III. This study is intended to establish whether there is a strong link between macroeconomic variables and their impact on inflation.
IV. This study is useful to control inflation and price stability in the economy.
V. The study is useful for future researcher as a reference.

1.6 Limitation of the Study

In this study researcher will use only four independent variable of macroeconomic policy of Nepal. Research have no any part of end, time and situation develop new variable create new problem and search new way of solution. Different tools and instrument are used in different economy at different time situation like real interest rate, unemployment rate, exchange rate, CRR (cash reserve ratio), SLR (statutory liquidity ratio), GDP, per capita income money supply (M2) etc) but researcher will consider only five independent variable (GDP growth rate, per capita income, Indian inflation money supply and exchange rate) .This research may not clear the total impact of macroeconomic variable of inflation in Nepal. The data analysis indicates that the only 85.9 percent of inflation explained by independent variable used in this study. The study considers only 18 years time series data of macroeconomic variables used in this study. Nepal has huge amount of trade deficit which may increase the inflation of Nepal but trade deficit is not consider in this study. This is the academic research for Master degree of management not an applied research so time and financial resource also constant over the study period.

CHAPTER – TWO

LITERATURE REVIEW

This chapter deals with the theoretical as well as empirical literature on the monetary determinants of inflation. The literature on the relationship between inflation and monetary policy tools has witnessed significant increase at three decades. In case of empirical review, international reviews are in large number and show the long history on investigation of nature of link between inflation and monetary policy tools as well as macroeconomic variable. Review of literature reveals that very few actions have been taken to investigate the relationship between inflation and monetary policy tools.

This chapter is organized as follows: section 2.2 deals with theoretical literature review, section 2.3 deals with empirical review and 2.4 is deals with research gap are presented.

2.1 Theoretical Review

The economic theory has given varying conclusion about microeconomic variables and inflation. This section mainly deals with Classical theory of economics, Keynesian theory of economics, Monetarism Theory, Quantity Theory of Money and Monetary Transmission Mechanism in Nepal.

2.1.1 Classical Theory

Classical economics, English school of economic thought that originated during the late 18th century with Adam Smith and that reached maturity in the works of David Ricardo and John Stuart Mill. The theories of the classical school, which dominated economic thinking in Great Britain until about 1870, focused on economic growth and economic freedom, stressing laissez-faire ideas and free competition. Many of the fundamental concepts and principles of classical economics were set forth in Smith's An Inquiry into the Nature and Causes of the Wealth of Nations (1776). The fundamental principle of the classical theory is that the economy is self- regulating. Classical economists maintain that the economy is always capable of achieving the natural level of real GDP or output, which is the level of real GDP that is obtained when the economy's resources are fully employed. While circumstances arise from time to time that cause the economy to fall below or to exceed the natural level of real

GDP, self adjustment mechanisms exist within the market system that work to bring the economy back to the natural level of real GDP. The classical doctrine that the economy is always at or near the natural level of real GDP is based on two firmly held beliefs: Say's Law and the belief that prices, wages, and interest rates are flexible. According to Say's Law**,** when an economy produces a certain level of real GDP, it also generates the income needed to purchase that level of real GDP. In other words, the economy is always capable of demanding all of the output that its workers and firms choose to produce. Hence, the economy is always capable of achieving the natural level of real GDP.

The achievement of the natural level of real GDP is not as simple as Say's Law would seem to suggest. While it is true that the income obtained from producing a certain level of real GDP must be sufficient to purchase that level of real GDP, there is no guarantee that all of this income will be spent. Some of this income will be saved. Income that is saved is not used to purchase consumption goods and services, implying that the demand for these goods and services will be less than the supply. If aggregate demand falls below aggregate supply due to aggregate saving, suppliers will cut back on their production and reduce the number of resources that they employ. When employment of the economy's resources falls below the full employment level, the equilibrium level of real GDP also falls below its natural level. Consequently, the economy may not achieve the natural level of real GDP if there is aggregate saving. The classical theorists' response is that the funds from aggregate saving are eventually borrowed and turned into investment expenditures, which *are* a component of real GDP. Hence, aggregate saving need not lead to a reduction in real GDP.

2.1.2 Keynesian Theory

This theory was developed by John Maynard Keynes (1883-1946). Keynesian ideas referred to as Keynesianism became very influential to economic policy after great depression (Engelhardt, 2009). Keynes argued that increased savings will not lead to lower interest rates. Therefore savings have no positive effect on investment as long as the economy suffers under employment Keynes explained that an increase in the general price level or inflation is created caused by an increase in aggregate demand which is above the aggregate supply. Keynes argues that if the economy is at full

employment output level, an increase in government expenditure(G), an rise in private consumption(C) and a rise in private investment(I) will cause a rise aggregate demand. This leads to a general increase in price levels. This inflation pressure is due to the fact that at full employment of output with maximum utilization of scarce resources, an economy is cannot increase its aggregate supply to match the increasing aggregate demand. Keynes established that there is a positive relationship between consumption(C) and income(Y) as a function

$C = f(Y)$.

The national output (Ys), which is today measured as Gross Domestic Product (GDP), as the sum of consumer spending (C) and all saving (S)

$Ys = C+S$

To keep it simple, all quantities supplied for a set price and everything that is saved, but not sold, contribute to GDP. From a demand-oriented perspective, John Maynard Keynes explained that that aggregate demand (YD), as the expenditures for the above produced GDP, is determined by consumer spending (C) and investor spending (I).

In open markets and economy, policy makers need to determine if the national output is demanded in such a way: If national income as aggregate demand (YD) equals (YS), saving (S) would equal investment (I) Keynes achievement was to demonstrate "that there might be a disequilibrium that could lead to a later equilibrium with unemployment and price instability" (Sherman & Gary, 1984). Keynes urged that governments should play a more active role in the economy .He provides a more specific ways for government to intervene so as to manage the economy targets especially to the level of employment and inflation.

2.1.3 Monetarism Theory

Monetarists like Milton freedman advocates for the market to regulate itself through market efficiency and reject most of government intervention. Friedman (2000) strongly opposes the Keynesian view that government spending stimulates the national output. The monetarism assume a crowding-out effect of governments spending on private investment, especially if the latter is deficit-financed (Sherman

and Evans 1984: 303). The whole monetarist argumentation will be carefully policy is needed to have been mentioned at this point (Engelhardt, 2009). According to the monetarist, the money supply though important is the not the only exclusively determinant of both the level of output and prices in the short run. However they argue that in the long run the prices are not influenced by the monetary policy. The monetarist theory explains that when the money supply is increased in order to grow or increase production and employment, creating an inflationary situation within an economy. Monetarist argue that an increase in money supply will only lead to increase in output or production and employment levels in the short run and not in the long run (Stanislaw & Yergin, 1998). There is a positive linear relationship between the money supply and inflation. They explain the relationship by the natural rate of unemployment.

The theory of natural rate of unemployment argues suggests that there will be a level of equilibrium output, employment, and corresponding level of unemployment naturally decided based on the features such as resources employment, and technology. This kind of unemployment is refereed to us the natural unemployment. It also notes that there people who are unemployment because they wish to be unemployed. These are people who are jobless but are not looking for a job. In the short run expansionary monetary policies will lead to a decrease in the natural rate of unemployment and increase the production but the effectiveness of expansionary policies will be inhabited in the long run because they lead to increase in inflation (Ricardo, 1817)

2.1.4 Quantity Theory of Money

This theory originated in the sixteenth century when Economist form Europe noticed higher levels of inflation associated with gold or silver. This theory proposes a positive relationship between changes in the money supply and the long- term price of goods. The theory explained that increasing quantity of money supply would lead to a almost equal percentage of the increase in price of commodities. The theory asserts that general changes in price are primarily caused by changes in the money in circulation (Ricardo, 1817). The quantity theory has provided a conceptual framework for interpretation in the contemporary financial events. The calculation of money circulation is based upon the fisher Equation;

Money in supply (M) X velocity of money (V) = the average price level (P) X The volume of transactions in the Economy or simply the aggregate output (Q). Causation is assumed to run from the left side of the right side the equation. Total spending impacted by changes in monetary base. The real output growth varies over different periods.

Empirical research papers of the quantity theory of money (QTM) have focused directly on the relationship between the rate of change of the money stock and inflation. In monetary Economics, the quantity theory of money is the theory that money supply has a direct, Proportional relationship with the price level. The theory was challenged by Keynesian Economics, but updated and reinvigorated by the monetary school of economics. While Main stream economists agree that the quantity theory holds true in the long run, there is still a disagreement about its applicability in the short run. Critics of the theory argue that money velocity is not stable and, in the short-run, prices are sticky, so the direct relationship between money supply and price level (Cheruyot, 2012)

The quantity theory of money, despite its affinity with monetarism in Western economics, has long been one of the accepted doctrines of the socialist monetary authority. The version of the quantity approach adopted is of course the classical, transactions-based, one rather than the modern, Friedmanite extension which includes considerations on interest rates, assets and wealth, and adaptive expectations, among other variables. An idealized scenario of using the theory in centrally planned economies (CPEs) is as follows: given the constancy of (or reliable information on) the velocity of monetary circulation (V) and the level of real output (y), the government could then automatically supply the appropriate amount of money (M) to the economy to facilitate transactions and maintain stability in the price level (P). Hence money is endogenous and passive, driven by socialist planning.

The theory therefore asserts that if the money supply growth rate is greater than the growth of real output, then velocity moves in the opposite direction in the short run. Excess money supply growth causes velocity to slow down momentarily, until prices can adjust. Cosgrove (2005) explains that in a socialist country, the money is influenced by a large number of economic and political factors; this is more felt when

the government is responsible for providing the purchasing power, industrial and agriculture procurements, wage payments to city workers and other state financing.

2.1.5 Monetary Transmission Mechanism

The monetary transmission mechanism is the process by which asset prices and general economic conditions are affected as a result of monetary policy decisions. Such decisions are intended to influence the aggregate demand, interest rates, and amounts of money and credit in order to affect overall economic performance. The traditional monetary transmission mechanism occurs through interest rate channels, which affect interest rates, costs of borrowing, levels of physical investment, and aggregate demand. Additionally, aggregate demand can be affected through friction in the credit markets, known as the credit view. In short, the monetary transmission mechanism can be defined as the link between monetary policy and aggregate demand.

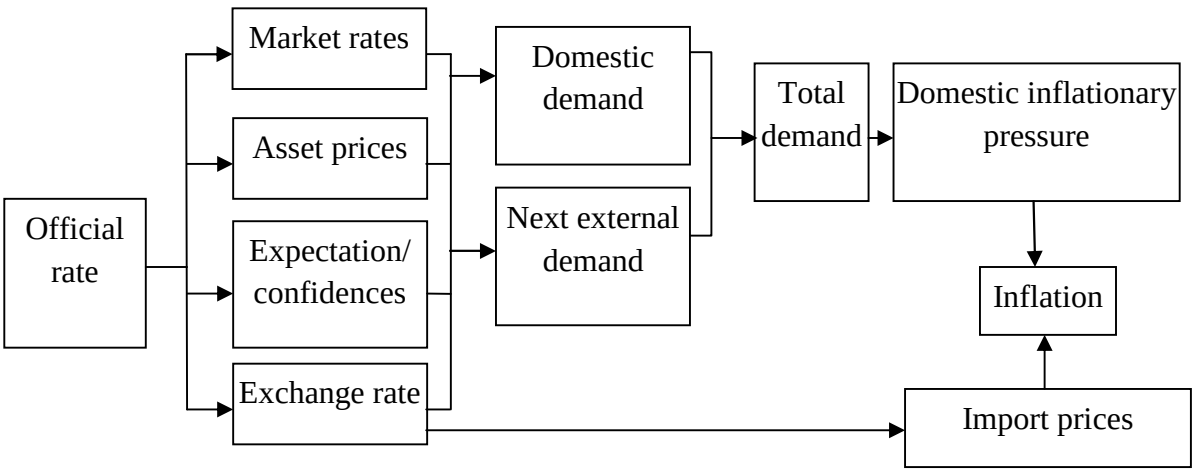
In the classical monetary transmission mechanism, a change in the money supply does not affect the real variables like output, employment and income. Money is neutral in its effects on the economy. This analysis is based on a direct and mechanical relationship between money and prices. If the quantity of money is raised, the price level will also rise in the same proportion, and vice versa. Such a relationship is based on the Quantity Theory Equation MV=PT or M/P = VT where, M is the total quantity of money, P is the price level of commodities traded, V is the velocity of circulation of M, and T is the volume of transactions of goods.

The transmission mechanism in the Keynesian theory is indirect via the interest rate. It is based on the existence of unemployment equilibrium in the economy and on the assumption of short run. In the Keynesian analysis, there are three motives for holding money: precautionary, transactions and speculative. The demand for money for speculative motive is determined by the interest rate, while the demand for precautionary and transactions motives is determined primarily by the level of income. Given the level of national income, the demand for money is a decreasing function of the rate of interest. This negative relationship between the interest rate and the demand for money provides a link between changes in the money supply and the aggregate variables of the economy. The Keynesians further believe that money and financial assets (bonds) are good substitutes. They are highly liquid and yield interest.

The monetarists said that the transmission mechanism by which changes in the money supply cause changes in aggregate demand (or expenditure), prices, interest rates and other economic variables is essentially a portfolio adjustment process. The economy is composed of individuals, households and firms who hold their wealth in the form of portfolios of assets. These assets are both financial and non-financial which include money, securities, durable and semi-durable goods, and services etc. Any change in the money supply causes disequilibrium between the public's actual and desired real cash balances of assets in their portfolios. Suppose the money supply is increased, this increases the cash balances with the public. People will reduce their excess cash balances by spending on a wide range of financial and non-financial assets like shares, bonds, goods and services, etc.

When the wealth effect, substitution effects and credit availability effects operate through an increase in the money supply, their initial impacts lead to additional income which, in turn, will expand the demand for consumer non-durable and durable goods and services and ultimately to increase in output and employment. The opposite will happen when the money supply is decreased.

Monetary Transmission Mechanism of Nepal



2.2 Empirical Review

Gatawal (2017) examined the impact of money supply, inflation, and interest rate on economic growth in Nigeria using time series data from 1973-2013. VAR Model and Granger Causality test within error correction framework were used. The results of the VAR model shows that there was a positive impact of broad money supply while inflation and interest rate exhibits a negative impact on growth most especially in the long run. The short run parsimonious results revealed that with the exception of inflation, broad money supply and interest rate were negatively related to economic growth. The study revealed that none of the explanatory variables granger causes economic growth, implying that money supply, inflation and interest rate have not influenced growth. The study recommended for an expansionary monetary policy, zero interest based finance capable of attracting investment in the real sector of the economy and arresting the inflationary tendency associated with monetary policy.

Chaudhary (2018) examined the relationship between inflation, money supply, real GDP and imported price (CPI) by reviewing relevant studies using Nepal as the reference country. The study used regression model to analysis the time series data. The study founded that the growth of money supply, the growth rate of real GDP and import price are the main determinants of inflation in Nepal. The study concluded the prices in Nepal are highly dependent on Indian prices because of a weaker supply of domestic production and increased imported goods and services from India from India.

Paudyal (2014) investigated short term and long term effects of the macroeconomic variables on the inflation in Nepal during 1975-2011. The variables considered in study were budget deficits, Indian prices, broad money supply, exchange rate and real GDP. The study used regression model and Wickens-Breusch Single Equation Error Correction model to analysis the data. The study found fixed exchange rate with India and Indian inflation are the main determinant of inflation in Nepal. The exchange rate and inflation rate of India were significant in long run implying that these variables are the determinants of inflation in Nepal. However, only budget deficit, money supply and Indian prices cause inflation in the short run. This study concluded that fixed exchange rate with India and Indian inflation is the main determinants of

inflation in Nepal. The value of Indian currency decrease or increase, the value of Nepalese currency is already changing.

Mohamed (2016) investigated the impact of monetary policy on inflation rate in Sudan during the period of 1970 to 2014 and used both descriptive and analytical method in this study. The variables considered in this study were money supply, exchange rate, GDP, budget deficit, government expenditure and dependent variable inflation. The result found that there is strong correlation between money supply, GDP, budget deficit and inflation but the exchange rate and government expenditure are not influence in inflation in Sudan. The researcher concluded that there is a group of interrelated factors led to high inflation in the Sudan; the most important of these factors are structural factors which were represented in the deterioration of GDP; structural factors considered one of the most important factors affecting inflation in Sudan. The study recommended that the government should depend on real sources in financing budget deficit rather than monetizing deficit by and borrowing from the central Bank, which has significant impact on increasing money supply, it has to ensure effective role in financing budget deficit and controlling inflation.

Sec (2015) examined the determinant of inflation in high inflation countries and low inflation countries. The study used Error correction model with time serious data 1970 to 2011. The variables used in this study were money supply, growth rate import of goods and services, national expenditure and dependent variable inflation. The study founded that money supply and national expenditure have significant effect on inflation in high inflation countries. In low inflation countries GDP growth have a negative impact and import of goods and services have positive impact on inflation. The study concluded all exogenous variables impact on inflation except national expenditure in low inflation countries. The import of goods and services have a negative impact and rest of all variable have a positive impact in inflation in low inflation countries.

Ghani (2017) studied the determinant of inflation in Malaysia. The researcher used econometric model and mathematical model to analysis the data. The variables used in this study were money supply, exchange rate, unemployment rate and dependent variable inflation. The study founded that 60% of inflation in Malaysia was explained by these variables and 40% in other variables. The money supply, exchange rate,

unemployment rate was positively correlated with inflation rate in Malaysia. He concluded high inflation may couse negative impact to a particular country. Inflation affect the all activities of the economy not only economic growth, it affect labor market, consumer price index and investment also. The study suggested to reduce the inflation government should try to reduce unlimited expenditure on non-development activities, reduce unlimited consumption and increase rate of tax.

Sabaey (2012) studied the sources of inflation in developing and developed countries. The study used regression model to analysis the time series data. The government expenditure, money supply, oil prices, interest rate, exchange rate population are independent variable and inflation is the dependent variable used in that study. The study founded that the determinant of inflation in developing countries are different from developed countries. The result shows determinant of inflation in developed countries include government spending, money supply, oil prices, interest rate, exchange rate and population but in developing countries interest rate and population are not influence in determine inflation. He concluded that the inflation in developed countries determined by monetary variable, demand side and supply side. The inflation of developing countries is determined by demand side, supply side and external factor.

Mameed (2011) studied the impact of monetary policy on gross domestic product (GDP). The researcher used Regression analysis technique to analyze the 30 year time series data. The study used money supply, interest rate, and inflation in independent variable and GDP is dependent variable. The analysis found only 81.1 % explained by the independent variable and rest in other factor. Which means 81.1 % of GDP growth depends on these variables. It also that interest rate has minor relationship with GDP but money supply greatly affects GDP in the economy. The study concluded that to achieve main objective of monetary policy (economic growth and price stability) government control money supply, reduce inflation and increase reserve money in the economy.

Yolanda (2017) analyzed factor affecting inflation and its impact on human development index and poverty in Indonesia. The study used multiple regression models to analysis the data. The variables are exchange rate, money supply, oil prices, gold prices and bank rate used in study. The result shows money supply, exchange

rate, oil prices, gold prices and BI rate are positive and significant in Indonesian economy. The movement of inflation depends on these variables. The study shows that said that inflation is disease in the economy of Indonesia, it impacts all economic activities of the Indonesian economy. The study suggested to improve this situation government should use economic policy study of different scholars.

Nigina (2013) studied the factor affecting inflation in Tajikistan. The study used VAR model to analyze the factor affecting price level of economy. The study used monthly data 2oo5 to 2012. The study found two types of factor on is cost pull factor of inflation and another is demand pull inflation. Under cost pull inflation exchange rate, world wheat prices, oil prices and labor supply in long run and but in short run world wheat prices and labor supply also significant in price level. Under demand pull inflation GDP gap, remittance inflow, board money supply, government expenditure and wage rate are significant with prices level. The study concluded supply of labor play important role in price level of economy and the under production inside the economy create unemployment problem. To improvement of the economy government should consider these factors in economic policy of the nation.

Wulan (2015) analyzed the factor affecting inflation in Indonesia. The data was analyzed by using multiple linear regression analysis. The study used dependent variable inflation and independent variable money supply, interest rate and exchange rate. The study found interest rate, money supply and exchange rate partially significant on inflation. The study concluded that interest rate, money supply and exchange rate have positive impact on inflation.

Taiwo (2011) analyzed the impact of inflation and monetary policy stabilization on economic growth performance in Nigeria. The study used econometric technique – OLS method to analysis the time series data from 1981 to 2008. The study used board money supply, interest rate and inflation in independent variable and GDP growth is dependent variable. The result showed that money supply is positive related to economic growth and significant in inflation but inflation is insignificant with GDP. The study concluded that monetary policy along is incapable of controlling inflation. It should be supplemented by fiscal measure, non monetary and non fiscal measures. The fiscal measures are highly effective for controlling government expenditure, personal consumption expenditure, private and public investment. The study

recommended that the central bank of Nigeria needs to deal with monetary policy in a more transparent manner to address the issue of expectation as inflation exhibits a high degree of inertia.

Abdullah (2012) analyzed the impacts of monetary policy on inflation in Bangladesh. The study used multiple regression models to analyze the data of Bangladesh and this study founded that inflation rate are correlated with growth rate of gross domestic product, and money supply in Bangladesh. There is positive correlation between GDP growth and inflation but negative correlation between inflation and money supply. The study concluded the large money supply and low GDP growth rate are the main determinant of inflation in Bangladesh. To make the balance between inflation and monetary policy government should control money supply, estimated real GDP growth rate and borrowing from non banking source.

Honore (2018) examined the relationship between monetary policy and inflation in Cameroon. The study used VAR model to analysis the data. The study used money supply, interest rate, GDP and exchange rate are independent variable and inflation is dependent variable. The result shows that there is a long run equilibrium relationship between the money supply and inflation, money supply has a positive and significant effect on inflation in Cameroon. The main determinant of inflation in Cameroon is the money supply. The study concluded monetary policy should be planned to maintain price stability by controlling the growth of the money supply in the Cameroonian economy.

Denbel (2016) examined the relationship between inflation, money supply and economic growth in Ethiopia. The study used VECM method of data analysis. The result indicated that there was bi-directional causal relationship between inflation and money supply and uni-directional causality from money supply and inflation. The study found the strong long run relationship running from inflation and economic growth to money supply. Money supply and inflation are negative in short run but large supply of money hazardous for the economy in long run. It increases inflation in the economy. Finally study concluded that the main cause of inflation in Ethiopia in government investment in different public sector and excess money supply in market. Money supply help economic growth, increase production and productivity in short run but if real output is not above the money supply it create great problem in

economy in long run. The study suggested central bank of Ethiopia to apply tight monetary policy and control supply side policy to reduce inflation.

Dingela (2017) studied the dynamic impact of money supply on economic growth of south Africa using time series data of 1980 to 2016. The study used autoregressive distributed lag and error correction model to investigate the impact of money supply (M3) on GDP per capita. The study included macroeconomic variable GDP per capita, board money supply, interest rate, inflation rate in his study. The study found that there were statistically significant positive relationship between money supply and economic growth in both short run and long run. The researcher concluded that central bank of Africa increase money supply for economic growth of Africa. Government should invest and promote public sector investment; it helps to alleviated poverty and unemployment problem from Africa.

Hossain (2013) examined the determinant of inflation in Bangladesh using time series data from 1990 to 2010. The ordinary least square (OLS) method has been used to explain the relationship. The study used money supply, exchange rate, interest rate, fiscal deficit as a variable in that study. The researcher found money supply and interest rate significant with inflation in long run and in short run money supply and fiscal deficit are significantly and negatively influence over inflation rate. It also found significant relationship between interest rate, fiscal deficit and nominal exchange rate. The study included the inflation is the major macroeconomic problem of Bangladesh. To reduce the inflation government and central bank reduce money supply due to positive relation with inflation. The study suggested increase production of goods and services, control wages and import from abroad for reduction of inflation. Along with that government take role of middleman to control population growth rate of Bangladesh.

Cioran (2014) examined the relationship between monetary policy and inflation. He used regression model to analysis the data. The relationship between macroeconomic variable and inflation is the issue of great issue of now days. The main aim of this study was to identify the causal relation between interest rate and inflation and unemployment and inflation. The researcher found there was significant direct relation between monetary policy interest rate and inflation. He also found there were inverse statistically significant relation between inflation rate and unemployment rate.

The study concluded that interest rate an efficient instrument for central bank to prevent inflation and the inflation rate was an effective instrument in preventing the increase of the unemployment. The study suggested effective use of monetary policy help to reduce inflation and get accountability, transparency, dynamics and quality in the economy.

Rehman (2010) examined the relationship between macroeconomic variable and exchange rate. The study applied multiple regression models to test the relationship of inflation and interest rate with exchange rate. The result shows that positive significant relationship between inflation and exchange rate while a negative significant relationship between interest rate and exchange rate. The interest rate and inflation rate is independent variable and exchange rate is dependent variable used in that study. The study concluded there was significant positive relation between inflation and exchange rate and significant negative relationship between interest rate and inflation.

Yugange (2017) examined the relationship between money supply and macroeconomic variables in China. The study used real GDP, money supply, inflation and exchange rate as a variable. The study applied the Vector auto regression (VAR) model to analysis the relation between variable. The study used time series data of 2000 to 2016. The finding of analysis revealed that in China increase in GDP can result increase money supply, and increase rate of inflation also increase money supply; oppositely increase interest rate can cause decrease in the money supply.

Gokal (2004) examined the relationship of inflation and economic growth. The study used multiple regression model and Victor auto correlation method to analyze the data. The study found the negative relationship between inflation and economic growth in Fiji. The increase economic growth rate decrease inflation and vice versa. The study concluded negative relationship between inflation rate and economic growth rate, in further other domestic factor also include inflation in Fiji like labor cost, output gap, and import from abroad. The study suggested control inflation and price stability in the economy government use that types of research paper to making economic policy.

Nawaza (2017) examined the causality relationship between inflation and macroeconomic variable using time series data of 1990 to 2012 in Pakistan. The study used multiple regression models to analyze the data. The study found money supply, interest rate and GDP significantly affect the inflation in Pakistan. The study established positive relation of inflation with money supply, government expenditure, government revenue, foreign direct investment and GDP while a negative relationship observed with interest rate. Another regression model shows inflation and exchange rate have a negative and significant effect on balance of trade and trade openness has a positive effect on balance of trade in Pakistan. The study concluded that positive association of inflation with money supply, government revenue, interest rate, foreign direct investment, GDP, exchange rate and trade openness and government expenditure is negatively correlated with inflation.

Rehman (2010) examined the relationship between macroeconomic variable and exchange rate. The study applied multiple regression models to check relation of interest rate and inflation rate with exchange rate. In this study interest rate and inflation rate used as independent variable and exchange rate is dependent variable. The result shows that significant positive relation found between inflation rate and exchange rate while negative and significant relation found between interest rate and exchange rate. The study used data of Pakistan and United Kingdom (UK). Finally he concluded the significant and positive relationship between inflation rate and exchange rate but significant negative relationship between interest rate and exchange rate in Pakistan and UK.

Acharya (2019) examined the relationship between money supply, income and price level of Nepal. The study used VECM models for long run causality test and VEC and VAR model for short. He found bidirectional long run causality between run test real income with both type of money supply (M1 and M2) in real term and unidirectional long run relation run from narrow money supply to consumer prices. There is no any relationship between long run as well as short run board money supply and consumer price level and no any causality between nominal GDP and general price level in long run. But in short run causality running from general price to nominal GDP. The study concluded macroeconomic variable like interest rate, money supply, and exchange rate are influenced to determine the stock price of Nepal. This implies that

macroeconomic variable influence investor's investment decision and motive of Nepal. The study suggested that Nepal should focus on growth of time deposit component of board money supply in long run for economic growth and control inflation.

Shrestha (2016) analyzed the macroeconomic impact of international reserve in south Asian countries. The study used panel VAR method for analysis the time serious data of 1090 to 2016. The study included seven south Asian countries. The study used economic growth, inflation, exchange rate and international reserve as a variable. The study found inflation has a significant positive with economic growth and negative relation with interest rate. The internal and external inflation affect the exchange rate in South Asian economies; exchange rate negatively affects the foreign reserve in selected economy. Result also shows reserve of foreign currency accumulation can have a significant impact on economic growth in these economy. He concluded international reserve mainly remittance inflow contribute to grow economies of these countries and it help to import goods and services from abroad.

2.3 Research Gap

This study identifies the determinants of inflation and its impact on inflation on the annual data of selected macro variable. The study use money supply growth rate, exchange rate, GDP growth rate, per capita income and inflation rate of Nepal and India. The factors that are analyzed and identified are guided by the studies in the field of economic policy (monetary policy and fiscal policy) making for the government. Therefore, this study used to understanding similar theoretical background and framework applied in the study of determinants of inflation in Nepal. It attempts to apply the knowledge about key factors that impacts on inflation in Nepal. The study also examining the relationship between some selected macroeconomic variables which affect the economic policy making in Nepal.

In context of Nepal, study related to determinant of inflation is not available plenty. Some scholars and economic review only study about it. Thus, this study aims to provide the real scenario of the factor affecting inflation in Nepal.

CHAPTER –THREE

METHODOLOGY

This chapter describes the methodology that was undertaken in conducting the study to arrive at the finding regarding the impact of the monetary policy and inflation rates in Nepal. This is a set of systematic technique used in research. This simply means a guide to research and how it is conducted. It describes and analysis methods, through more light on their limitations and resources, clarify their pre- suppositions and consequences, relating their potentialities to the twilight zone at the frontiers of knowledge. This section was deals with the research design, source of data and data collection and data analysis tools use in this research. This study was used secondary data. The data were collected from Nepal Rastra Bank. This study was covered the data from 2001 to 2018.

3.1 Research Design

The study used descriptive research design in this study. The studies used time series empirical data on the variables to describe and examine the impact of the monetary policy tools in countering inflation in Nepal for the period 2001 to 2018. This was done by establishing correlation coefficients between the inflation and the monetary policy tools employment by the central bank the period. The Multiple Regression Model was used to establish the relationship between dependent and independent variable and also correlation is used to examining the relationship between variable. The secondary data was collected and tested by using different statistical tools. The data was collected from web site of World Bank and NRB head office of Baluwatar Kathmandu.

3.2 Population and Sample

The annual data was collected from Nepal Rastra Bank which variable were used in this study. The population of this study is whole economy of the Nepal and sample is selected macroeconomic variable of Nepalese economy. The variables used in this study were money supply growth rate, exchange rate, GDP growth rate, per capita income and inflation rate of Nepal and India. The data was collected from Nepal Rastra Bank 2001 to 2018. The Nepal is under developing countries in the world, economic crisis of different time and situation Nepalese economy also bear so many

inflationary problem. This study used four macroeconomic variables to test the impact of inflation in these variables and examining the relationship between these variables.

3.3 Source of Data and Data Collection

This study used secondary data in order to meet the objective of the study. The secondary data was obtained from annual statistical bulletin of central bank of Nepal (NRB). This study used five independent variables and one dependent variable. Time series data of 2001 to 2018 of these variables was collected and tested by using different statistical tools. The main objectives of this study were to analyze the impact of macroeconomic variable in inflation and examining the relationship between these variables. This study used annual time series data of selected macroeconomic variables of Nepal.

3.4 Data Analysis Tools

The collected data were processed and analyzed by using statistical package for social science (SPSS) software. The data were collected from Nepal Rasstra Bank and then value put in computer and analyzed through statistical tools. The main statistical tools used in this study were multiple regression analysis, correlation, T – test, and F – test. The main purpose of this study is to analyzed the impact of monetary policy tools in inflation and examining the relationship between these variable (dependent variable inflation and independent variable money supply, exchange rate, cash reserve ratio and interest rate).

3.4.1 Descriptive statistics

Descriptive statistics are brief descriptive coefficients that summarize a given data set; this can be either a representation of the entire or a sample of a population. Descriptive statistics are broken down into measures of central tendency and measures of variability (spread). Measures of central tendency include the mean, median, and mode, while measures of variability include the standard deviation, variance, the minimum and maximum variables, and the kurtosis and skewness. This study used mean, standard deviation, maximum and minimum in the study. Mean measure average of individual variable and standard deviation measure variation over the time period. The study also gives minimum and maximum value of variable over the study period.

3.4.2 Scatter Diagram

Scatter Diagrams are convenient mathematical tools to study the correlation between two random variables. As the name suggests they are a form of a sheet of paper upon which the data points corresponding to the variables of interest are scattered. Judging by the shape of the pattern that the data points form on this sheet of paper we can determine the association between the two variables, and can further apply the best suitable correlation analysis technique. This study used scatter diagram to analyze the correlation between dependent and independent variables.

3.4.3 Multiple Regression Analysis

Multiple regression Models is a statistical technique that uses several explanatory variables to predict the outcome of a response variable. A multiple regression equation is an equation for estimating the value of dependent variable from two or more independent variables. In real situation dependent variable is not only affected only by a single independent variable but affected by several independent variables so it is mathematical relationship between one independent variable and two or more dependent variables. It is used to analyze the impact of determinant of inflation on it in this study. Let INF is dependent variable and $X_{1,}$ $X_{2,}$ $X_{3,}$ X_4 & X_5 are independent variable then multiple regression equation is;

$$INF = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + E$$

3.4.4 Correlation

Correlation is a statistic tools that measures the degree to which two variables move in relation to each other. It is used to examining the relationship between two or more variable in this study. The correlation shows the direction of variable, if the used variable were positive or negative and significant or insignificant relation with each other in equation. Correlation is lies between +1 to (-1), which means positively correlated and negatively correlated respectively. There is positive correlation means same direction of variable and negative correlation means opposite direction between variable.

3.4.5 F – Test

F-Test is using test the utility of regression model. The general analysis of variance (ANOVA) table that provides the F- Test result for a multiple regression model. The value of F-Test statistics appears in the last column and can be compared to F_α with P

degree of freedom in the denominators and n-p-1degree of freedom in the denominators to make the hypothesis test conclusion. If the last column of analysis of the variance table indicates that we can reject H0: $\beta_1 = \beta_2 = 0$ because the P value is less than $\alpha = 0.01$. The test gives us sufficient statistical evidence to conclude that one or more of the parameters is not equals to zero and that the overall relationship between dependent and independent variables is significant. However, if H0 cannot be rejected, we do not have a sufficient evidence to conclude that a significant relation at present. The F-Test I used to determine whether a significant relationship exists between the dependent variables and set of all independent va4riables; we will refers to the F-Test as the test for overall significance.

3.4.6 T – Test

A t-test is a statistical hypothesis test. T-test is used to determine whether each of the individual independent variables is significant. A separate T-test is conducted for each of the independent variables in the model; we refer to each of this T-test as a test for individual significance.

3.5 Determinants of Inflation

Inflation can be defined as the persistent rise in the general price level across the economy over time. Mild inflation is considered to be desirable for economic growth. However, high and variable inflation, in general, leads to uncertainties in income and expenditure decisions of the different groups of the society; distorts economic growth; lowers savings and investments; and makes more expensive cost of capital. Using open-market operations, the NRB trades Nepal government securities over the open marketplace to increase or decrease the amount of money in the system and maintain price stability in the economy.

3.5.1 Money Supply Growth Rate

Money supply (M2) as a measurement of the money supply is a critical factor in the forecasting of issues like inflation. Inflation and interest rates have major ramifications for the general economy, as these heavily influence employment, consumer spending, business investment, currency strength and trade balances. M2 is a calculation of the money supply that includes all elements of M1 as well as "near money." M1 includes cash and checking deposits, while near money refers to savings deposits, money market securities, mutual funds, and other time deposits. These assets

are less liquid than M1 and not as suitable as exchange mediums, but they can be quickly converted into cash or checking deposits. M2 is a measure of the money supply that includes cash, checking deposits, and easily money, convertible near money. M2 is a measure of the money supply that includes cash, checking deposits, and easily convertible near money.M2 is a broader measure of the money supply that M1, which just include cash and checking deposits.M2, is a closely watched as an indicator of money supply and future inflation, and as a target of central bank monetary policy.

3.5.2 Exchange Rate

A foreign exchange rate is the rate at which one currency is exchanged for another. Thus, an exchange rate can be regarded as the price of one currency in terms of another. An exchange rate is a ratio between two monies. The open market exchange rates are provided and fixed by Nepal Rastra Bank, the central bank of Nepal. The bank supervises other banks and financial institutions in Nepal and guides the Nepali monetary policy. The exchange rates are solely provided for the purpose of the bank. The fixed exchange rate between Nepal and India which is 100 NC = 160 IC means 100 Nepalese currency equals to 160 Indian currency. But exchange rate of United State (US) dollars is fluctuating every day, current exchange rate with US dollars is around 114 NC of one US dollars. Due to the fixed exchange rate with India Nepalese inflation also depends on Indian inflation. If price of any product change in Indian markets then the price of product automatically change in Nepalese Market. The open boarder area and maximum import of goods and services from India is also the issue of inflation in Nepal. To control inflation and maintain price stability Nepal Rastra Bank prepare the economic policy like monetary policy and fiscal policy.

3.5.3 Inflation Rate

Inflation rate is the percentage at which a currency is devalued during a period. This is devaluation is evident in the fact that the consumer price index (CPI) increases during this period. In other words, it’s a rate at which the currency is being devalued causing the general prices of consumer goods it increase relative to change in currency value. Inflation depresses the purchasing power of money, reinforces the unequal distribution of income, condenses the competitiveness of the economy, and encourages imports. Economists use the CPI to measure it by measuring the price

changes in a determined market basket of core goods and services. There are two types of inflation demand – pull and cost – push. The demand-pull inflation occurs during periods of strong economic activity. The full employment of available production and technology resources causes the price of goods and services to rise, yet the supply cannot automatically adjust to the increased demand. Cost-push inflation occurs during periods of slow economic activity. The price of goods and services exceeds their marginal cost due to oligopolistic profits, trade unions, low productivity or government taxes, or exceeds the price of raw materials.

3.5.4 Gross Domestic Product

Gross domestic product is a total market value of the goods and services produced by a country's economy during a specified period of time. It includes all final goods and services that are produced by the economic agents located in that country regardless of their ownership and that are not resold in any form. It is used throughout the world as the main measure of output and economic activity. In economics, the final users of goods and services are divided into three main groups: households, businesses, and the government. One way GDP is calculated known as the expenditure approach is by adding the expenditures made by those three groups of users. Accordingly, GDP is defined by the following formula:

GDP = Consumption + Investment + Government Spending + Net Exports

3.5.5 Per capita Income

Per capita is a measure of the amount of money earned per person in a certain area. Per capita income is calculated national income divided by population size. Per capita income is often used to measure a sector's average income and compare the wealth of different populations. It is often used to measure a country's standard of living. It is usually expressed in terms of a commonly used international currency such as the euro or United States dollar, and is useful because it is widely known, is easily calculable from readily available GDP and population estimates, and produces a useful statistic for comparison of wealth between sovereign territories. Our per capita income is express in term of US (united state) dollar. The current per capita income of Nepal is $1034 in 2019 and $1026 in last year.

3.6 Model Specification

The data for this study are obtained from central bank of Nepal (NRB) annually statistical bulletin from 2001 to 2018. The multiple Regression Models should employ to obtaining the numerical estimates of the coefficient in different equation.

Multiple Regression Model

$INF = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + E$

Where,

X_1 = Exchange rate

X_2 = Money supply growth rate

X_3 = gross domestic product growth rate

X_4 = Per capita income

X_5 = Indian inflation

β_0 = Constant

E = Error term

$\beta_1, \beta_2, \beta_3, \beta 4$ & $\beta 5$ = Parameters

Dependent variable: INF (Inflation Rate)

3.7 Research Hypothesis

Hypothesis testing is an act in statistics whereby an analyst tests an assumption regarding a population parameter. The methodology employed by the analyst depends on the nature of the data used and the reason for the analysis.

This study considers the following hypothesis that was tested in this research;

1) H0: Exchange rate has not significant impact in increasing inflation rate over the study period.
   H1: Exchange rate has significant impact in increasing inflation rate over the study period.

2) H0: Money supply growth rate has not significant impact in increasing inflation rate over the study period.
   H1: Money supply growth rate has significant impact in increasing inflation rate over the study period.
3) H0: GDP growth rate has not significant impact on reducing inflation rate over the period under study.

H1: GDP growth rate has significant impact on reducing inflation rate over the period under study.

4) H0: Per capita income has not significant impact in reducing inflation rate over the period under study.

   H1: Per capita income has not significant impact in reducing inflation rate over the period under study.

5) H0: Indian inflation rate has the not significant impact to increasing inflation rate over the period under study.

   H1: Indian inflation rate has the significant impact to increasing inflation rate over the period under study.

CHAPTRE – FOUR

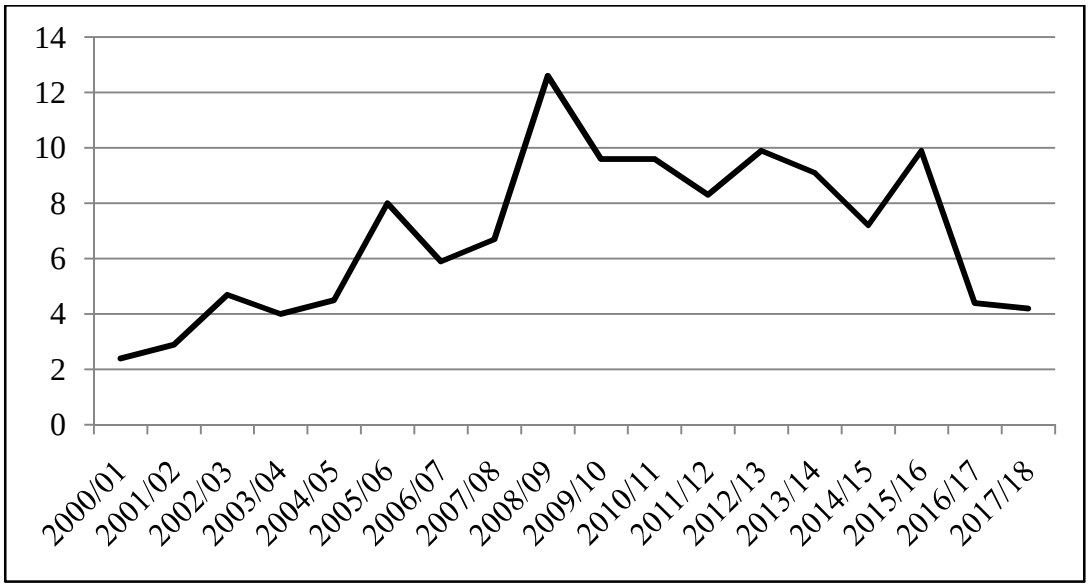
RESULTS

This chapter deals with the analysis presentation and interpretation of data, which deals with secondary data collected from NRB. To fulfill the objective of study analyze data in various way presented and tested. The main objective of study is to analyze the impact of monetary policy tools on inflation in Nepal and to examining the relationship between selected macro variables and inflation in Nepal. To obtain the result data has been analyzed according to the research methodology mentioned in chapter three. The study includes Trend analysis, Scatter Diagram, Multiple Regression, correlation, F-Test, and T-Test.

4.1 Trend Analysis

This section deals with trend and movement selected macro variable of Nepal 2001 to 2018. It shows the fluctuation of macro variable over the study period.

Figure 4.1: Inflation of Nepal

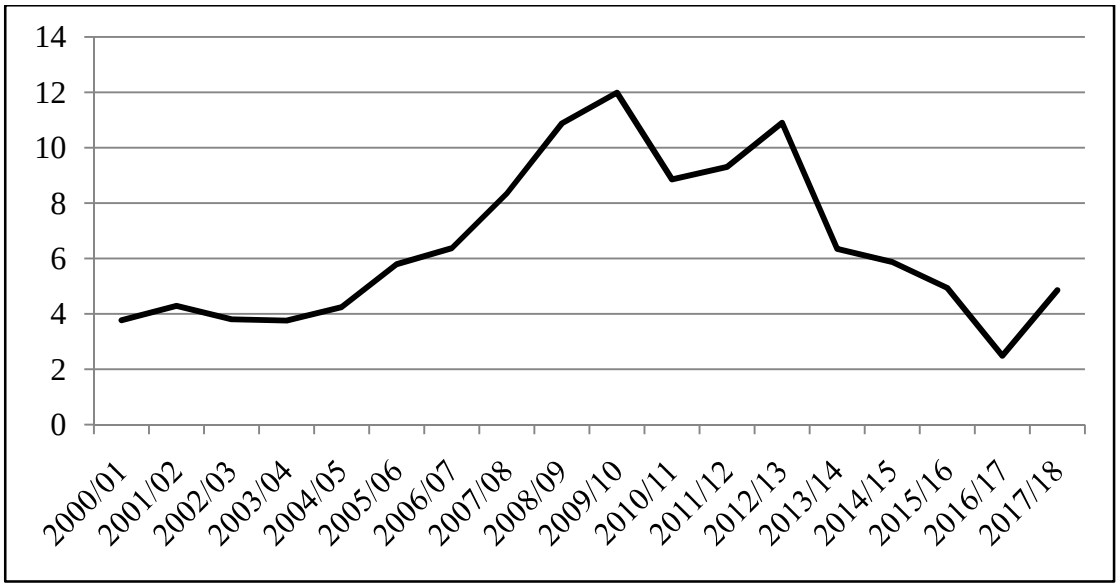


Surce: Nepal Rastra Bank

Figure 1 shows the trend of inflation rate of Nepal between the year 2001 and 2018. After liberalization some restriction are eliminated and easy to operate private sector in Nepal. The trend of inflation in Nepal over the study period is fluctuating and

moves up and down. The minimum rate of inflation in Nepal is 2.4% in 2001 and increase in decreasing way till 2007. Due to the economic crisis in 2008/09 depressed maximum developed and developing countries all over the world. The economic crisis also affect the Nepalese economy and increase inflation rate 12.6% in 2009, which was maximum rate of inflation of Nepal over the study period. The Nepal has fixed exchange rate with India and mostly depend on import, trade deficit creates depression in economy. In 2015 earthquake depressed again in Nepalese economy, more than 8000 peoples were died and many cultural as well as physical properties was collapsed. The inflation in 2016 was increased 9.9% then inflation slow down in recent year 4.4% in 2017 and 4.2% in 2018.

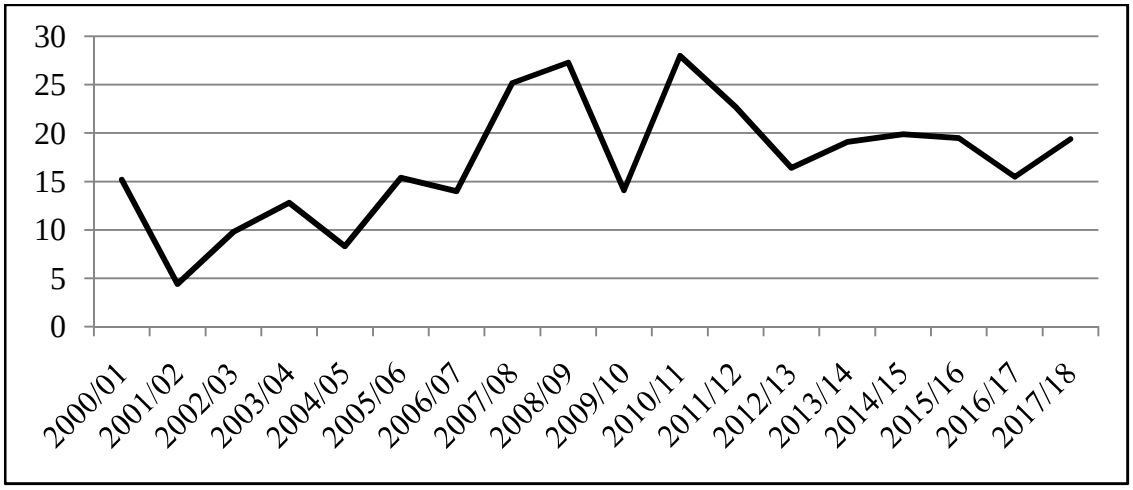
Figure 4.2: Inflation of India



Source: World Bank

Figure 2 shows the annual inflation rate of India. Fixed exchange rate and free trade between two country Nepal and India consumer price index also move in same way. In 2001 Inflation rate of India was 3.779% and increased to 11.989% in 2009, which was the highest inflation rate over the study time period. After the economic crisis in 2008/09 decreased inflation rate 2.491 in fiscal year 2016/17 and 4.861 in 2017/18 and inflation in Nepal is 4.2% in fiscal year 2017/18.

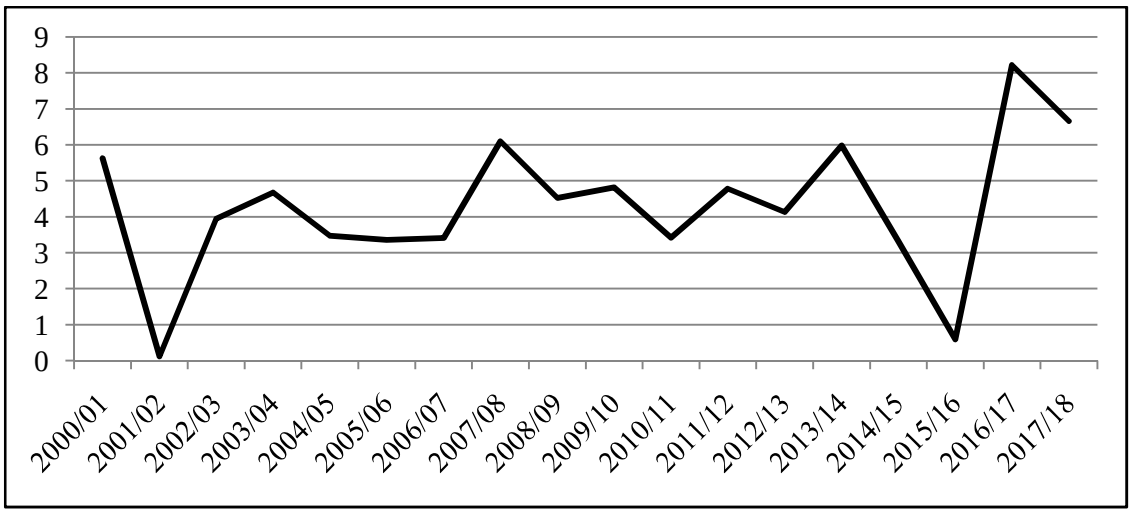
Figure 4.3: Money Supply Growth Rate



Source: Nepal Rastra Bank

Figure 3 shows that the money supply growth rate of Nepal in fiscal year 2001 to 2018. In 2000/01 money supply was 15.2 % and decreased growth rate 8.3 in 2004/05 the fluctuated in after year. The lowest M2 growth rate over the study period was 4.4% in 2002 and highest growth rate was 28% in fiscal year 2010/11.

Figure 4.4: Gross Domestic Product Growth Rate

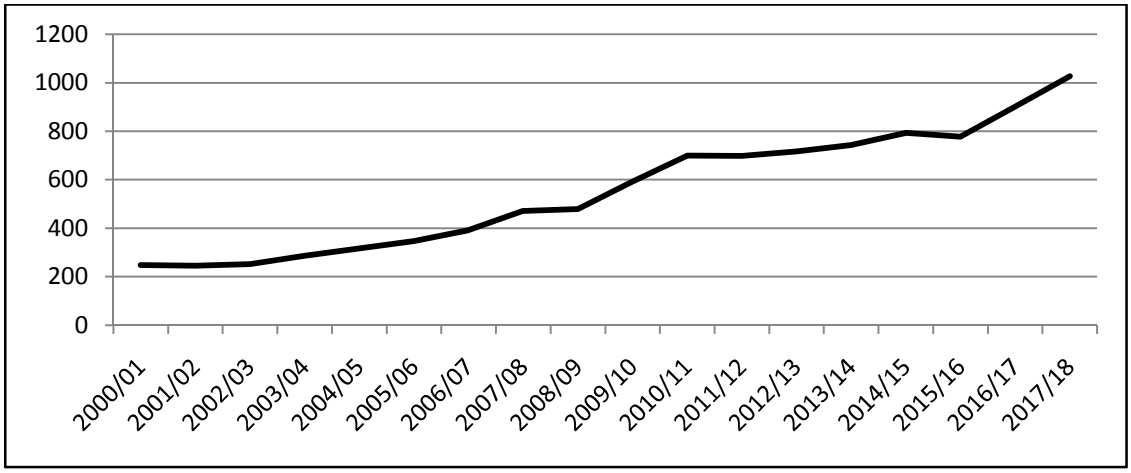


Source: Nepal Rastra Bank

Figure 4 shows the annual growth rate of gross domestic prices of producer's price. The trend of GDP also fluctuated over the year like a money supply growth rate. The

lowest GDP growth rate was 0.12% in 2002 and highest rate was 8.22% in 2017 over the study period.

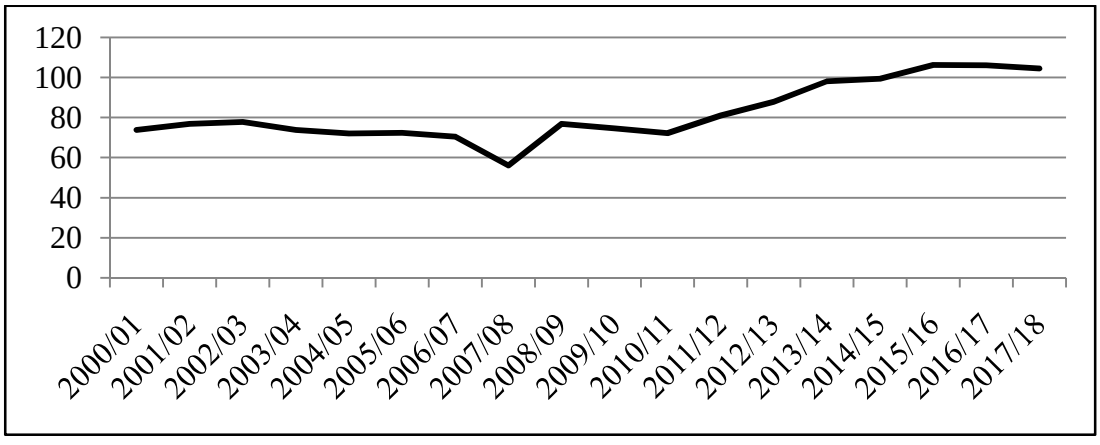
Figure 4.5: Per capita Income



Source: World Bank

Figure 5 shows that the per capita income of Nepal in US dollar. The level of per capita income over the study time period was in increasing way. The per capita income of Nepalese individual in 2001 was $ 247. The current per capita income in 2019 is $1034 and last year per capita income was $1026.

Figure 4.6: Exchange Rate of Nepal with US Dollar



Source: Nepal Rastra Bank

Figure 6 shows that the exchange rate of Nepalese currency with US dollar. The lowest rate of exchange rate of Nepal with a US dollar was Rs.56.02 in fiscal year 2007/08 and highest rate was Rs.106.35 in fiscal year 2015/16. The exchange rate of 2018 was Rs104.56 with a US dollar. The change value of Indian currency and us dollar value of Nepalese currency also change.

4.2 Descriptive Statistics

Descriptive statistics are brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire or a sample of a population. Descriptive statistics is useful because it allows you to take a large amount of data and summarize it. It helps to describe and understand the features of a specific data set by giving short summaries about the sample and measures of the data.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Inflation rate	18	2.4	12.6	6.883	2.9004
Exchange rate	18	56.02	106.35	82.2617	14.64841
M2 growth rate	18	4.4	28.0	17.056	6.3308
GDP growth rate	18	.1200	8.2200	4.288333	1.9548951
Per capita income	18	245	1026	554.28	248.154
Indian inflation rate	18	2.4910	11.9890	6.493333	2.8679998

Source: SPSS

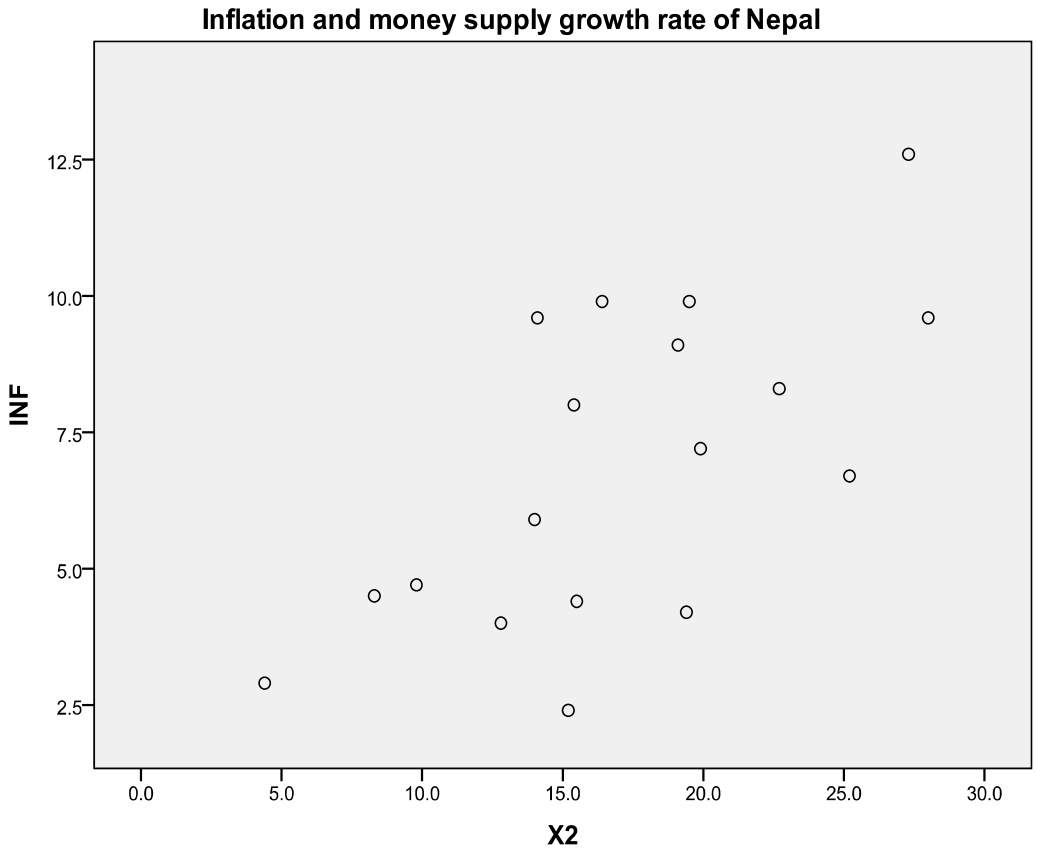
Above table shows that the maximum inflation was 12.6%, minimum inflation 2.4%, mean 6.883 and variation on inflation was 2.9004% over the study time period. The maximum exchange rate was Rs.106.35, minimum exchange rate Rs.56.02, average of exchange rate Rs.82.2617 and variation on exchange rate was Rs.14.648. Similarly average money supply growth rate was 17.056% and variation 6.3308% over the study period. The average GDP growth rate was 8.2883% and variation on GDP growth rate 1.9548% over the study period. The mean value of per capita income was $554.28, variation on per capita income $248.154 and maximum per capita income was $1026 in study period of 18 year. The inflation of India also affects the inflation

of Nepal, average inflation rate of India was 6.49% and variation on inflation was 2.8679% in Indian inflation.

4.3 Scatter Diagram

Scatter Diagrams are convenient mathematical tools to study the correlation between two random variables. As the name suggests they are a form of a sheet of paper upon which the data points corresponding to the variables of interest are scattered. Judging by the shape of the pattern that the data points form on this sheet of paper we can determine the association between the two variables, and can further apply the best suitable correlation analysis technique. In the Scatter diagram figure move on left to right shows that the there is positive correlation between the both variable and the figure move right in left shows there is negative correlation between the variables. The following figure shows the correlation between inflation and some macroeconomic variables.

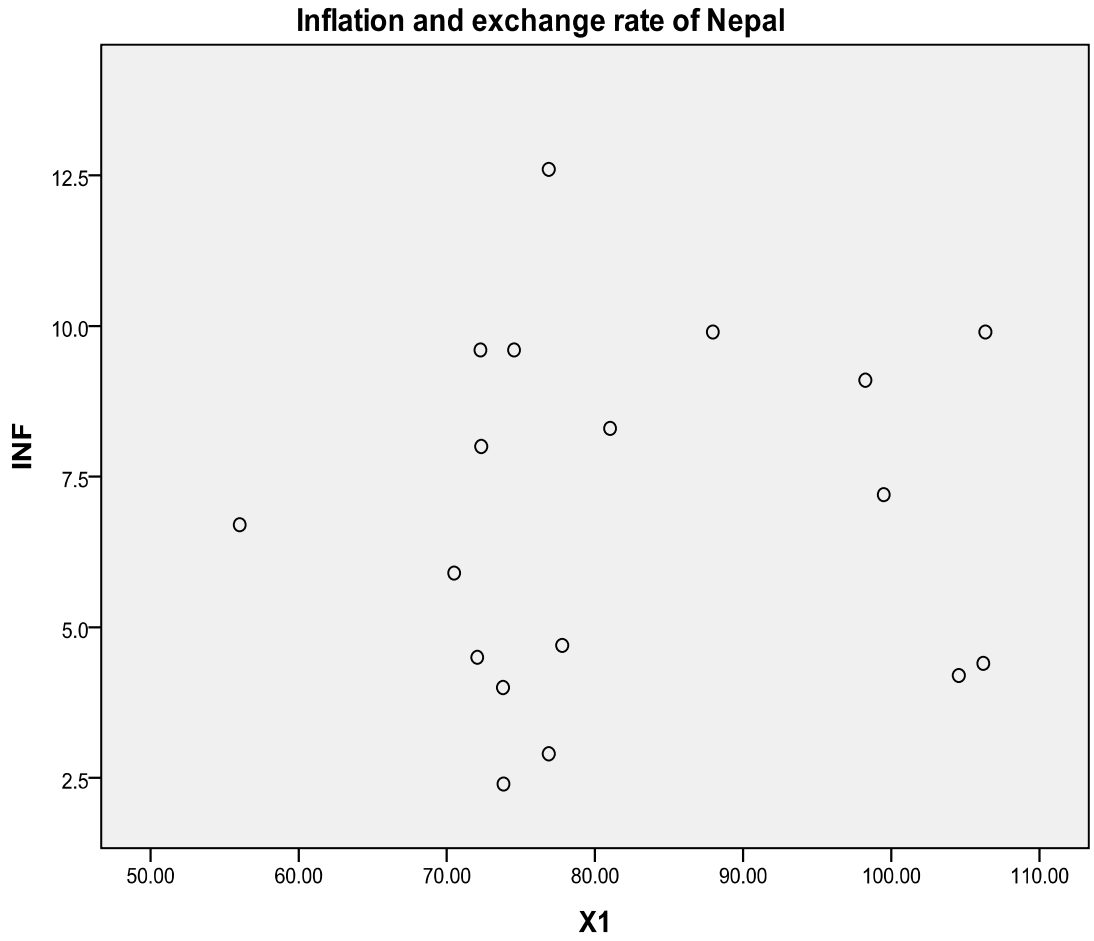
Figure 4.7: Inflation and Money Supply Growth Rate



Source: SPSS

Figure 1 shows the correlation between inflation and money supply growth rate of Nepal in 18 year time period. The figure indicates that there was positive correlation between inflation and money supply growth rate. The money supply has strong effect on inflation and inflation is always and everywhere monetary phenomenon (Barro, 2007). Literature review of Honore (2018), and other study shows that there is positive correlation between inflation and money supply.

Figure 4.8: Inflation and Exchange Rate

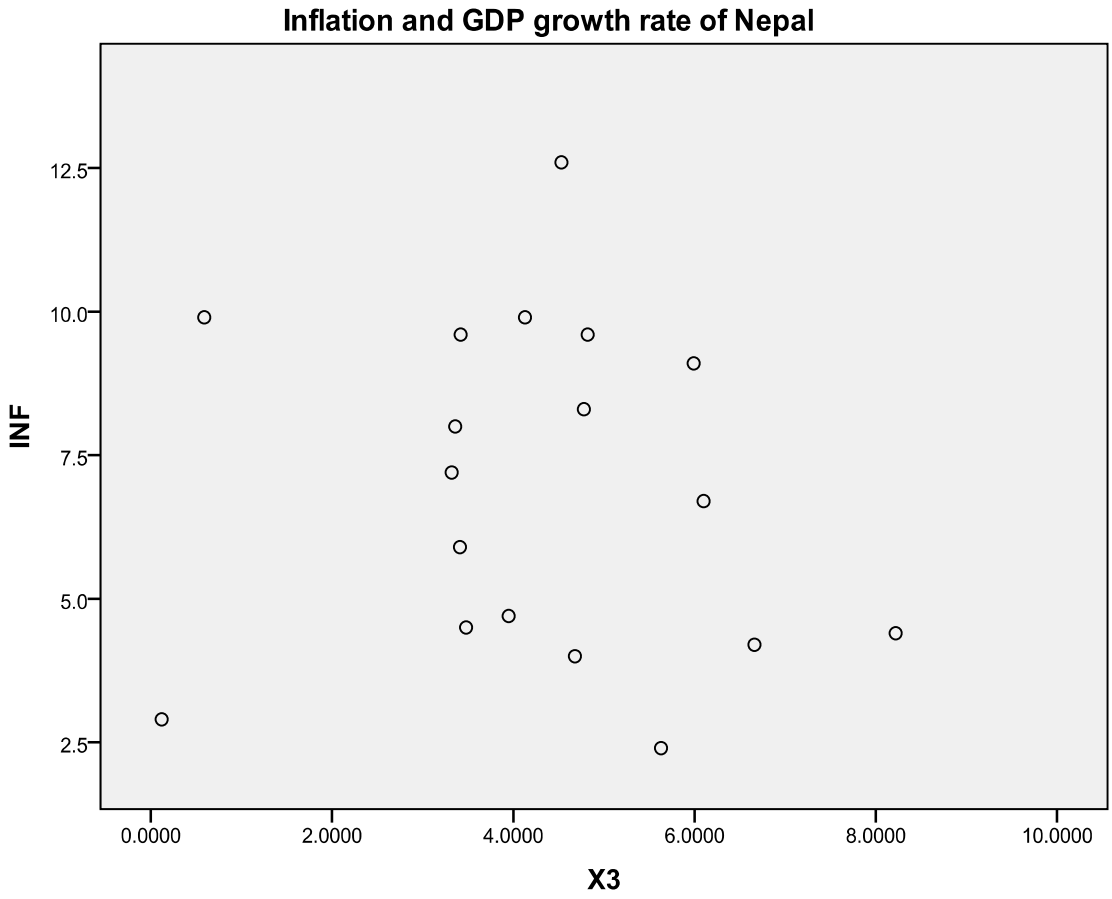


Source: SPSS

Above figure shows there is positive correlation between inflation rate and exchange rate of Nepal over the study period. All the points of diagram move in upward in figure which shows positive correlation between variables. The studies of Yolanda (2017) also stated that there was positive correlation between inflation rate and exchange rate. Increase the exchange rate of domestic currency will increase price of product in domestic market. The Nepali market is totally import oriented market and

exchange rate of foreign currency directly affect the price of product in domestic market.

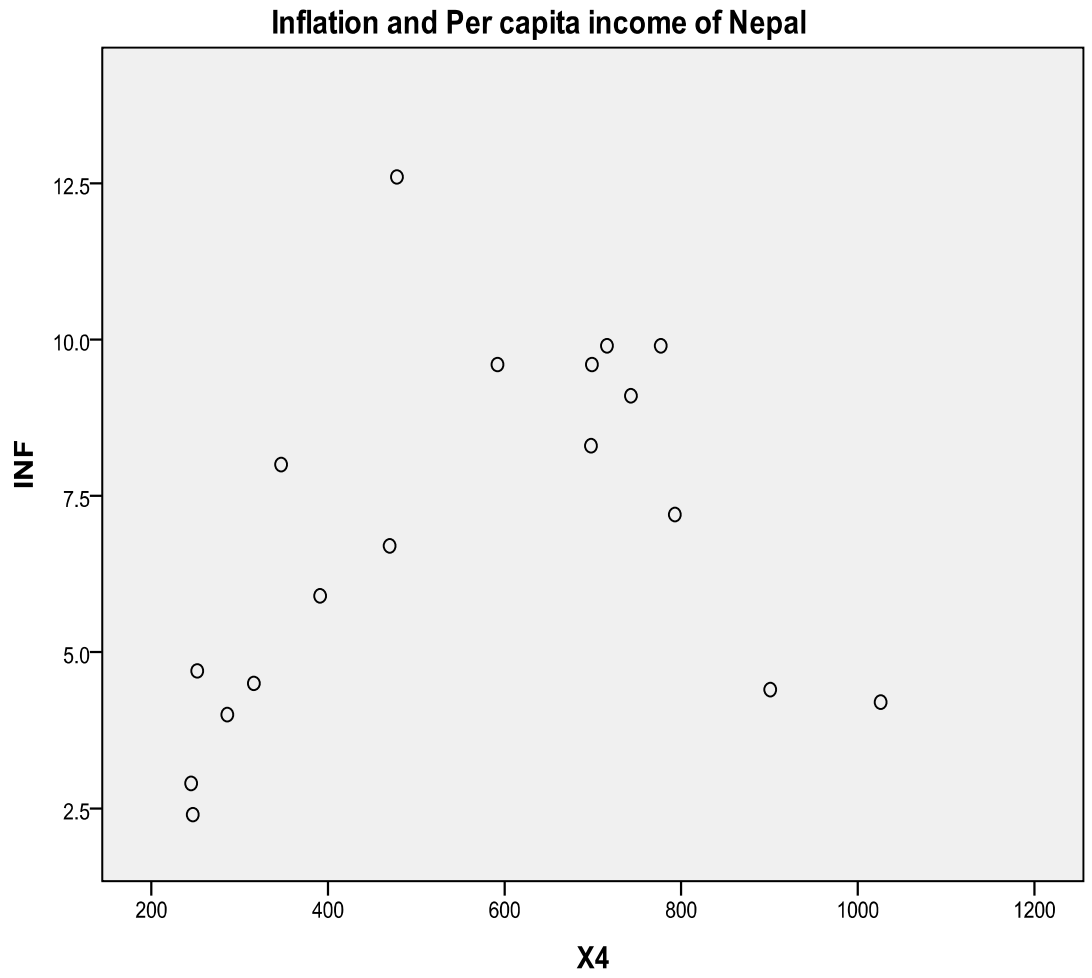
Figure 4.9: Inflation and GDP Growth Rate in Nepal



Source: SPSS

Figure 3 indicates that the Scatter diagram is downward o0sloping in left to right. The figure shows there is negative correlation between inflation and GDP growth rate of Nepal. High GDP growth rate reduce the inflation rate. Previous study also shows the GDP is insignificant and negatively correlated with inflation rate. Increase the production of domestic product within country leads to decrease the price of product and reduce inflation rate of economy. Literature indicate high inflation rate in import oriented and underdeveloped countries and low inflation rate in export oriented developing and developed countries.

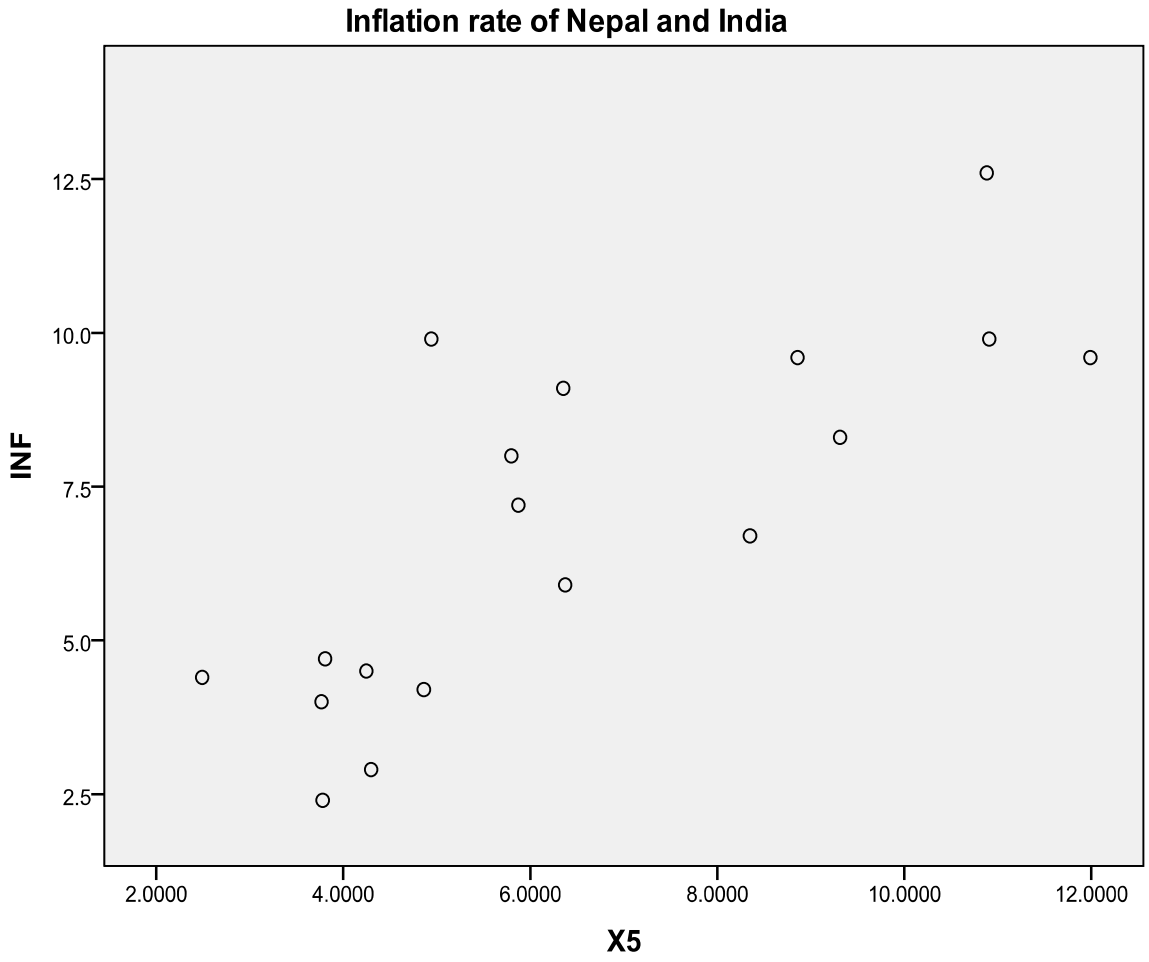
Figure 4.10: Inflation and Per capita Income



Source: SPSS

Above figure shows the correlation between inflation rate and per capita income of Nepal. In the diagram figure is upward sloping in right to left. There is positive correlation between inflation rate and per capita income of Nepal. Higher the per capita income increase consumption as well as investment in the economy and increase the demand within the economy which helps to increase price of product in the market and also increase rate of inflation.

Figure 4.11: Inflation Rate of Nepal and India



Source: SPSS

In above table shows the correlation between inflation rate of Nepal and India. The Nepal has the fixed exchange rate with India and two third part of trade with India. Most of the basic product as well as convenient product are purchased from India and trade deficit is also high with India. The price of product is move in same way in both market Nepal and India and inflation is also correlated with each other.

4.4 Correlation Analysis

Correlation is the term that refers to the strength of relationship between two variables. Correlation coefficient can range from -1 to +1. the value of -1 represent a perfect negative correlation while a value of +1 represent perfect positive correlation. The value of 0 means there is no relationship between the variables being tested. Table 4.2 shows the correlation between variable employed in this study.

The following table reveals the bivariate Pearson correlation coefficient between inflation and macroeconomic variables inflation rate of Nepal, exchange rate, Money supply growth rate, GDP growth rate, per capita income and Indian inflation which is denoted by INF, X1, X2, X3, X4, and X5 respectively. '**' sign indicates that correlation is significant at 1 percent level and '*' sign indicates that correlation is significant at 5 percent level.

Table 4.2: Correlations

		Inflation rate	Exchange rate	M2 growth rate	GDP growth rate	Per capita income	Indian inflation rate
Inflation rate	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	18					
Exchange rate	Pearson Correlation	.075	1				
	Sig. (2-tailed)	.769					
	N	18	18				
M2 growth rate	Pearson Correlation	.654**	.053	1			
	Sig. (2-tailed)	.003	.835				
	N	18	18	18			
GDP growth rate	Pearson Correlation	-.119	.123	.297	1		
	Sig. (2-tailed)	.637	.627	.231			
	N	18	18	18	18		
Per capita income	Pearson Correlation	.355	.764**	.510*	.354	1	
	Sig. (2-tailed)	.148	.000	.030	.150		
	N	18	18	18	18	18	
Indian inflation rate	Pearson Correlation	.791**	-.278	.533*	.004	.186	1
	Sig. (2-tailed)	.000	.265	.023	.987	.459	
	N	18	18	18	18	18	18

Source: SPSS output

Table 4.1 shows the bivariate Pearson correlation coefficient between inflation and other macroeconomic variable exchange rate, money supply growth rate, GDP growth rate, per capita income, and Indian inflation. The correlation coefficient is based on the data from 2001 to 2018. The data are collected from Nepal Rastra Bank and web

site of World Bank. The correlation coefficient of exchange rate and inflation rate is 0.075; there is insignificant and positive correlation between exchange rate and inflation rate in Nepal. The correlation coefficient of Money supply growth rate and inflation rate is 0.654; there is significant and positive correlation between money supply growth rate and inflation rate of Nepal. The correlation coefficient of GDP growth rate and inflation rate is -0.119; there is insignificant and negative correlation between GDP growth rate inflation rates. The correlation coefficient of per capita income and inflation rate is 0.355; there is insignificant and positive correlation between per capita income and inflation rate of Nepal. The correlation coefficient of inflation rate of Nepal and India is 0.791 there is significant and positive correlation between inflation rate of Nepal and India.

4.5 Multicollinearity Test

Multicollinearity is the existence of perfect or exact linear relationship among some or all explanatory variables included in a regression model.

Table 4.3: Coefficients

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
		B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
1	(Constant)	-9.240	4.047		-2.283	.041		
	Exchange rate	.138	.052	.696	2.658	.021	.171	5.850
	M2 growth rate	.229	.074	.500	3.090	.009	.447	2.238
	GDP growth rate	-.255	.187	-.172	-1.361	.198	.737	1.356
	Per capita income	-.006	.003	-.524	-1.788	.099	.137	7.324
	Indian inflation	.825	.160	.816	5.151	.000	.467	2.142

Source: SPSS

Above table shows the multicollinearity test of variable used in this study. The variance inflation factor (VIF) value of X_1, X_2, X_3, X_4, and X_5, is less than 10 which are 5.85, 2.238, 1.356, 7.324 and 2.142 respectively. There is no multicollinearity among the selected used variable in this study. All the selected variables used in this study are positively or negatively correlated with each other. The P – value of exchange

rate, money supply rate, and Indian inflation rate is less than 0.05 and these are significant with inflation rate of Nepal. But the P –value of GDP growth rate and per capita income is higher than 0.05, these variables are insignificant in inflation rate of Nepal.

4.6 Regression Analysis

Regression analysis is a statistical tool for the investigation of relationships between variables. It is one of the most commonly used statistical techniques in social and behavioral sciences. Its main objective is to explore the relationship between dependent variable and one or more independent variables. The variable used in this model to analyzed the impact of independent variable in dependent variable. The regression analysis used in this study also help in testing the hypothesis of the study. The analysis applied the statistical package for social sciences (SPSS) version 22 to compute the measurements of multiple regressions for the study.

The regression analysis of the model shows in table 4.3.

Table 4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.927[a]	.859	.801	1.2949

Source: SPSS output

Coefficient of determination explains the extents to which changes in the dependent variable in this case Consumer Price index can be explained by the independent variables. Coefficient of determination will show the percentage of variation in the department that is explained by all the five variables i.e. the money supply (M2) growth rate, GDP growth rate, exchange rate, per capita income and Indian inflation. The correlation and the coefficient of determination of the dependent variables inflation when all the five independent variables are combined was measured and tested. From the findings the 85.9%.of the inflation in Nepal was attributed to combination of the five independent factors (Money supply growth rate, exchange rate, GDP growth rate, per capita income and Indian inflation) and rest 14.1 present inflation of Nepal is determined by other factor which are not consider in this study.

The adjusted R square is 80.1, which is less than the unadjusted F square by around 5.8 points. This decline adjusted r square is due to the addition of independent variables, without much explanatory power, to the regression plane. The regression model of this study is:

$INF = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + E$

Table 4.5: ANOVAs

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	122.885	5	24.577	14.658	.000[a]
	Residual	20.120	12	1.677		
	Total	143.005	17			

Source : SPSS

The regression analysis of ANOVA table shows the P value is 0.00 which means model is significant at 5 percent significance level. At 0.05 level of significance (α), the test statistics required to carry out the test F-statistics which is F=14.658 from the ANOVA table. The critical value of F at 0.05 level of significance, based on v_1=5 and v_2=12 degree of freedom is 3.11. Since the calculated value of F exceeds the critical value of F, we reject H0. Alternatively, using p value approach, since the stated level of significance 0.05 exceed the calculated significance of 0.000, we reject Ho.

Table 4.6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-9.240	4.047		-2.283	.041
	Exchange rate	.138	.052	.696	2.658	.021
	M2 growth rate	.229	.074	.500	3.090	.009
	GDP growth rate	-.255	.187	-.172	-1.361	.198
	Per capita income	-.006	.003	-.524	-1.788	.099
	Indian inflation rate	.825	.160	.816	5.151	.000

Source: SPSS

Table 4.4 shows the regression analysis, β coefficient, F- Test T- Test and P-value. The P-value is less than 0.05 percent is significant with inflation and more than 0.05 percent is insignificant with inflation. The table shows the exchange rate, money supply growth rate and Indian inflation is the significant with inflation, the P-value of these variables is less than 0.05 percent. The GDP growth rate and per capita income is insignificant with inflation, the P-value of these variable is more than 0.05 percent. The equation after including the coefficient of the variables observed from the analysis becomes:

$$INF = -9.240 + 0.138X_1 + 0.229X_2 – 0.255X_3 – 0.006X_4 + 0.825X_5 + E$$

Where INF is the inflation rate of Nepal, X_1 is exchange rate, X_2 is money supply growth rate, X_3 is GDP growth rate, X_4 is per capita income and X_5 is Indian inflation rate. This means that assuming all other variables are Zero then we would have an inflation or CPI change -9.24 percent. The findings show that a unit changes in exchange rate change inflation in 0.138 units. Similarly a unite change in money supply growth rate change inflation in 0.229 units and a unit change in GDP growth rate change inflation in 0.255 units. In the same way a unite change in per capita income change inflation rate is 0.006 units and change a unit of Indian inflation of Nepal change 0.825 units. The study shows that the Indian inflation is highly affect the inflation of Nepal.

4.7 Measure Findings

Fluctuations in inflation distort the smooth functioning of the economy because of its effect of the economic value of the local currency. Governments have mandated the Central Banks to put up strategies that will ensure price stability. In Nepal the inflation rate as measured by the consumer price index has fluctuated over the period of study. There are several factors that can be attributed to this cause. The five factors studied in this project have contributed for about 85.9% of the reason for the fluctuations of the consumer price index. This means that there other variables which contributes to inflation but have not been considered in this study. From the findings the inflations seems to be increasing with the increase in money supply, exchange rate, per capita income and Indian inflation rate. This means there is positive relationship between these variables and inflations. The study also finds negative correlation between GDP growth rate and inflation. The finding indicates that the

increase GDP growth rate reduce the inflation rate in and increase exchange rate, money supply, per capita income and inflation rate of India increase inflation rate of Nepal. Central bank of Nepal, which has been mandated with formulating strategies to control inflation, therefore, needs align its policies so as to avoid excessive fluctuations which distorts. The major findings of this study are as follows:

1. The trend analysis shows the maximum inflation rate of Nepal is 12.6% in fiscal year 2008/09 and minimum inflation rate is 2.4% in fiscal year 2000/01.
2. The trend analysis of inflation rate of India indicates that the maximum rate of inflation rate is 11.989% in fiscal year 2008/09 and minimum inflation rate is 2.491% in fiscal year2016/17.
3. The trend line indicates the maximum money supply growth rate is 28% in fiscal year 2010/11 and minimum rate is 4.4% in fiscal year 2001/02.
4. The trend line of GDP growth rate indicates the maximum growth rate is 8.22% in fiscal year 2016/17 and minimum growth rate is 0.12% in 2001/02.
5. The lowest per capita income is $247 in fiscal year 2000/01 and highest per capita income is $1026 in fiscal year 2017/18.
6. The maximum exchange rate of Nepali rupees with US dollar is Rs.106.35 in fiscal year 2015/16 and minimum exchange rate is 56.02 in fiscal year 2007/08.
7. The descriptive statistic table indicates the mean value of inflation rate of Nepal is 6.883% and variation on inflation rate is 2.9004% over the 18 year study period.
8. The finding indicates the average value of exchange rate is $82.2617 and variation on exchange rate is $14.6484 in 2001 to 2018.
9. The mean value of money supply growth rate is 17.056% and variation is 6.33% and maximum growth rate is 28% in study period.
10. Average GDP growth rate is 4.2883% and variation on growth rate is 1.9548% and maximum growth is 8.22% and minimum rate is 0.12% over the study period.
11. The mean value of per capita income is $554.28, variation on per capita income is $248.145 and maximum per capita income is $1026 in study.

12. Table also shows the average inflation rate in India is 6.49% and variation on inflation rate is 2.8689% in 18 year study period.
13. Scatter diagram indicates that there is positive correlation between inflation rate and exchange rate.
14. The diagram also shows that there is positive correlation between inflation rate and money supply growth rate and also positive correlation between inflation rate of Nepal and India.
15. The scatter diagram also shows positive correlation between per capita income and inflation rate of Nepal and negative correlation between GDP growth rate and inflation rate of Nepal.
16. There is the positive correlation between inflation rate and exchange rate (i.e. 0.075) of Nepal over the study period.
17. There is positive correlation between inflation rate of Nepal and money supply growth rate (i.e. 0.654) of Nepal over the study period.
18. There is negative correlation between GDP growth rate and inflation rate (i.e. -0.119) of Nepal over the study period.
19. There is positive correlation between per capita income and inflation rate (i.e. 0.355) on Nepal over the study period.
20. There is positive correlation between inflation rate of Nepal and India (i.e. 0.791) over the study period.
21. The multicollinearity test table shows the VIF value of the entire variable included in study is less than 10 so there is no multicollinearity among these variable.
22. The regression analysis model summary shows the value of R square is 85.9% and adjusted value of R square is 80.1%. This indicates that the 85.95 inflation is determined by the exchange rate, money supply, GDP growth, per capita income and Indian inflation and rest 14.1% inflation is determined by the other factors which are not considered in this study.
23. The study found the 85.9% of inflation is determined by explained variable and rest in other factors, which indicate error term.
24. The ANOVA table shows the P-value of F-Test is 0.00 it indicates the model is significant at 1 percent significance level.
25. The calculated value of F statistic is 14.658 and tabulated value of F statistic is 3.11, so we reject H0.

26. The coefficient table shows exchange rate is significant with inflation (i.e. P-value is 0.021) in study period.
27. The money supply growth rate is significant with inflation rate (i.e. P-value is 0.009) of Nepal over the study period.
28. The GDP growth rate is insignificant with inflation rate (i.e. P-value is 0.198) of Nepal in study period.
29. The per capita income is insignificant with inflation rate (i.e. P-value is 0.099) of Nepal over the study period.
30. The inflation rate of India is significant with inflation rate of Nepal (i.e. P-value is 0.000) over the study period.

CHAPTER – FIVE

CONCLUSION

This chapter includes summary, conclusion and recommendation. All the summary, conclusion and recommendation are made according to obtained data from analysis. Recommendation is made for beneficial for economic policy making to the government of Nepal.

5.1 Discussion

The study focused to establish the relationship between inflation and macro variable in Nepal. The study also shows the impact on selected macroeconomic factors in inflation rates in Nepal. To achieving these objectives, the study used exchange rate, money supply growth rate, GDP growth rate, per capita income and Indian inflation are independent variables and inflation rate of Nepal is dependent variable. To control the inflation is not an easy task of any economy it has the macro level impact in economic activities. From the findings outlined in chapter four, the study showed that the Inflation rate and money supply are positively correlated with each other. The study showed that as the money supply in circulation increased inflation also increased. This can because increase in money supply leads to people having more disposable income. This causes the amount of demand is exceed the supply of goods hence leading to a rise in prices of goods. The exchange rate and inflation rate also positive correlation shows in analysis parts of the study. Increase in the exchange rate of domestic currency will increase price of product in domestic market as well as foreign market. There is significant positive correlation between money supply growth rate and inflation rate over the study period. There is insignificant negative correlation between GDP growth rate and inflation rate in Nepal. There is insignificant positive correlation between per capita income and inflation rate over the study period. The study also indicates that there is significant positive correlation between inflation rate of Nepal and India.

The literature review shows money supply and inflation is positively correlated with each other like study of Honore, Yolanda, Twiwo etc. The real GDP growth rate and inflation rate in negatively correlated with each other. Higher the gross domestic product growth rate reduces the inflation rate and vice versa. High volumes of

production reduce per unit production cost of goods and services in market and increase its supply also. Per capita income increases the consumption of peoples and increase disposable income in the market. High rate of inflation is not a good for the economy it reduce purchasing capacity of the consumer and value of currency. The two third parts of trade of Nepal with India and fixed exchange rate between the countries, Indian price index affect the price index of Nepal. In chapter four trend analysis of inflation rate of Nepal and India are fluctuating and move in same direction and scatter diagram also shows there is positive correlation with inflation rate of Nepal and India.

The quantity theory of money and Keynesian theory also support this study. The quantity theory of money explained that increasing quantity of money supply would lead to an almost equal percentage of the increase in price of commodities. Keynes explained that an increase in the general price level or inflation is created caused by an increase in aggregate demand which is above the aggregate supply. The monetarist theory also explain that when the money supply is increased in order to grow or increase production and employment and creating an inflationary situation within an economy. The previous study of paudyal and chaudhary consider the Indian inflation is the determinant of inflation of Nepal. The inflation rate of India is significant positive correlation with inflation rate of Nepal. The study of Ghani also indicated that the positive correlation between money supply and inflation and exchange rate and inflation rate of Malaysia. The study of Sec found that the money supply and exchange rate is significant with inflation rate of high inflation countries but GDP growth rate have negative impact on inflation rate. Taiwo also found that money supply is positively correlated with inflation rate and GDP growth has a negative correlation with inflation rate of Nigeria. The Denbel's study indicated that money supply is negatively correlated with inflation rate of Ethiopia. To control the inflation rate government should consider these factor for making monetary policy and fiscal policy of Nepal. No any interest of government in research and development and without research formulating policy is the main issue of high inflation and low development index in Nepal. The analysis of this study shows the 85.9% of inflation is explained by these selected independent variables and rest in other factors which are not consider in this study.

5.2 Conclusion

The purpose of this study has been to discuss the relative impact of selected macroeconomic variable on inflation and relation with each other. Our empirical results emphasize a significant and positive correlation between the money supply, inflation rate and exchange rate and inflation rate. But there is negative insignificant correlation between inflation rate and GDP growth rate and positive insignificant correlation between per capita income and inflation rate of Nepal. Higher GDP growth rate increase the supply in domestic market as well as foreign market. Large volume of production reduces per unit production cost of product in market and reduces price level. The high per capita income increases the consumption and demand of product, which leads to raise price of product in market. Indian inflation rate is the main factors to determining inflation rate of Nepal. The analysis indicates the other variable remain constant only 1 unit change price in Indian market affect the 0.82 unit of inflation of Nepal. The Indian inflation highly influenced the determining inflation in Nepal.

The study concluded that the money supply, exchange rate, GDP growth rate, per capita income and Indian inflation rate are the main determinants of inflation of Nepal. These variables explained the 85.9% of inflation rate of Nepal and 14.1% are explained by other. The study concludes that exchange rates and Indian inflation are critical element of general price levels in Nepal. This is because Nepal has a negative balance of trade, therefore being a net importer which means that in purchases more in foreign currency than it exports. The prices of imported goods heavily correlate with the prevailing rates of foreign exchange. The study also indicates that negative insignificant correlation between inflation rate and GDP growth rate. But there is insignificant positive correlation between inflation rate and per capita income. The higher GDP purchase less from foreign market and export more in international level. These macro variables play measure role to reduce inflation and to achieve price stability in the economy.

5.3 Implications

I. The study recommends that the policy makers mainly the Central Bank should make a critical analysis of the intended inflation targets when making the economic policy (monetary policy and fiscal policy).This is because it was

found that the selected macro variable has a significant impact on the price levels of Nepal.

II. The Policy makers should align the money supply targets with the medium and long-term economical goals. This is because the level of supply affects aggregate demand a key element in any economical set up.

III. The study recommends that the policy makers involved in setting economic goals to ensure that that there are geared towards maintaining a stable foreign exchange rate. Because of importer and exporter fluctuating exchange rate significantly affect the price level of Nepal.

IV. The Nepal government must consider the consumer price index of India when formulating economic policy, because it's impact on inflation of Nepal is significant and positive correlation.

V. The study focused on relationship between the selected macro variable and inflation rate in Nepal. The studies need to carry on other monetary policy and fiscal policy tools and its impact on inflation.

VI. It is also a common knowledge that there could be black markets and other factors that might affect inflation hence more studies need to be carried to ensure all factors that affect inflation are studied.

VII. The most of the foreign transaction done through shadow banking in Nepal, it affects the price level of in economy. The next studies include all factors to relate to inflation.

VIII. The study suggested that inflation affects many other variables in the economy and consumer price index is most important factor to maintain price stability and economic growth of the economy.

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APPENDIX

Fiscal year	**Inflation rate of Nepal**	**Exchange rate**	**Money supply growth rate**	**GDP growth rate**	**Per capita income**	**Indian inflation**
2000/01	2.4	73.83	15.2	5.63	247	3.779
2001/02	2.9	76.88	4.4	0.12	245	4.297
2002/03	4.7	77.79	9.8	3.95	252	3.806
2003/04	4	73.79	12.8	4.68	286	3.766
2004/05	4.5	72.06	8.3	3.48	316	4.246
2005/06	8	72.32	15.4	3.36	347	5.797
2006/07	5.9	70.49	14	3.41	391	6.373
2007/08	6.7	56.02	25.2	6.1	470	8.349
2008/09	12.6	76.88	27.3	4.53	478	10.882
2009/10	9.6	74.54	14.1	4.82	592	11.989
2010/11	9.6	72.27	28	3.42	699	8.858
2011/12	8.3	81.02	22.7	4.78	698	9.312
2012/13	9.9	87.96	16.4	4.13	716	10.908
2013/14	9.1	98.25	19.1	5.99	743	6.353
2014/15	7.2	99.49	19.9	3.32	793	5.872
2015/16	9.9	106.35	19.5	0.59	777	4.941
2016/17	4.4	106.21	15.5	8.22	901	2.491
2017/18	4.2	104.56	19.4	6.66	1026	4.861