CHAPTER - I
INTRODUCTION

1.1 General Background of the Study

There is no uniformity among the economist on the definition of money. Some economist define money in narrow sense, where as others define it in a broader sense. In general, money is something which performs simultaneously the function of a medium of exchange, an unit of account and a store of value. There are three broad views regarding the definition of money. Firstly money which includes currency in the hands of the public and demand deposits at commercial banks. Secondly there are other economists who argue that time deposits at commercial banks are such a close substitute for demand deposits that they should be included in the quantity of money. Third there are still others who argue that the liabilities of certain non-bank financial intermediaries should be included in the quantity of money.

Money supply means the aggregate, stock of money owned by the public in economy. Total money supply in an economy consist of currency i.e. metallic coins and paper notes issued by the central banks and demand deposit held by the public at commercial banks. The quantity of currency supplied is determined solely by the public's demand for money.

As money has a definite role in determining the level of income (expenditure) and prices, an effective regulation of an economy is made possible through monetary changes. Theoretically, as the excess of money supply over and above its demand is the driving force for creating liquidity, wealth, credit availability and price-expectation effects (through

which money enters the pipeline and affects the economy). A stabilization policy requires the use of instrumental variables which exert their effect on the quantity of money supply of course, money supply, in this process, remains as the intermediate target variables, linking the policy instruments with the final target. If the economy is operating below its potential capacity, even the rate of economic growth may be accelerated through monetary adjustments. This last point deserves special significance for developing economies (Sharma, 1987).

The control of money supply is an important policy tool in conducting monetary policy within the monetary targeting framework. The success of monetary policy critically depends on the degree of controllability that the monetary authority has over money supply. The implicit assumption is that the central bank can determine the growth of money supply. The monetarist in general argue that the monetary authorities can exercise effective control over the stock of money while the non-monetarists hold that the determination of stock of money is part of the simultaneous solution for all variables in the financial and real sectors of the economy. Apart from policy action by the central bank, money stock is determined by the behaviour of the public in various asset and commodity markets. Opposing such non-monetarist arguments, the monetarist argue that the behaviour patterns of the public and the banking system are stable and predictable enough to permit the monetary authorities to control the stock of money (Islam, 2008).

In general money supply is determine by two distinct factors i.e. the monetary base or high power money and the money multiplier. The monetary base is the significant determinant of the size of money supply. Money supply varies directly in relation to the changes in the monetary base. Monetary base refers to the supply of funds available for use either

as cash or reserve of the central bank. Monetary base changes due to the policy of the government and is also influenced by the value of money. Money multiplier has positive influence upon the money supply. An increase in the size of money multiplier will increase the money supply and vice versa. Nepal Rastra Bank is the central monetary authority to control the money supply in Nepal.

A systematic and organized approach towards the establishment of the monetary system in Nepal was introduced only after the establishment of Nepal Bank Limited in 1937. Gradually people realized that a central bank was needed for controlling and supervising monetary institutions, as a result, Nepal Rastra Bank was established in 1956. But effective supervision of national financial activities was actively taken up by it only after the establishment of a number of financial and developmental institutions.

As in other growing economies, the supply of money in Nepal is also increasing, obviously one of the important reason is that nation is in the process of monetization and the supply has to keep pace with development process. Moreover the supply should be consistent with the national economic growth. Low supply would have deflationary consequences, where as higher supply would have inflationary consequences. In Nepalese economy M_1 as well as M_2 are increasing. M_1 which constitutes the currency and demand deposit has lower growth rate in comparison to M_2 which is made up of fixed as well as saving deposits along with cash and current deposits.

1.2   Statement of the Problem

Historically, the analysis of supply of money has occupied a relatively less important place than the analysis of demand for money in

the literature of monetary theory. Because of the prevalence of gold standard the need for the development of a theory of money supply over time was not felt. In the gold standard money supply depend upon the discoveries of gold mines and activities of the miners. But with the growth of demand deposit, fractional reserve banking and the development of central banks with the power to regulate the money supply, effort began in the direction of development of the theory of money supply.

There is still a debate of what exactly the level of money supply is appropriate. It is said that the desired level of money supply is obtained by taking real GDP growth rate, income elasticity of money demand and inflation rates. For example, if real GDP growth rate is 5 percent, the income elasticity of money demand is 2 percent and inflation is 4 percent. The monetary authorities will have to keep the growth rate of money supply $5 \times 2 + 4 = 14$ percent for the year.

Though, huge amount of capital is needed for the fulfillment of the economic goals of underdeveloped countries like Nepal. An excess money supply will have dangerous side effects on the economic activities of the nation. Thus, the government or the central bank in most countries exercises monetary control measures. In real scene Nepal Rastra Bank has been conducting monetary management since 1966. It was only in the year 1966, NRB was given the status of a regulation authority. It is because only in 1966 Nepal Rastra Bank was given autonomy, prior to this NRB was under the ministry of finance (Hamal, 1972). It has used both qualitative as well as quantitative measures of monetary management for the achievement of the economic goals of the nation.

Nepal Rastra Bank is however, solely responsible to manage money supply in a desirable limit. It has had to face certain limitation in controlling money. Nepal Rastra Bank, as the central Bank of the country, has been making annual monetary policy since 2002/03.

The following table shows the implementation situation of monetary polices.

Table No. 1.1

Policy Rates and the Implementation Situation of Monetary Policies

Year	Inflation		Eco. Growth		Money Supply			
					M_1		M_2	
	T	A	T	A	T	A	T	A
2002/03	4.0	4.8	4	3.1	9	8.6	10.8	9.8
2003/04	4.3	4.0	4.7	3.7	9.2	12.2	11.2	12.8
2004/05	4.0	4.5	4.5	2.5	10.5	11.2	12.5	12
2005/06	5.0	8.0	4.5	2.3	12	14.2	13	15.6
2006/07	6.0	6.4	5	2.5	12.9	12.2	16.1	14.0
2007/08	5.5	7.7	5	5.3	14	21.6	15.6	25.2
2008/09	7.5	13.8	7	4.7	16	19	18.5	21

Source: Monetary Policy (various issues)

T= Target M_1= Narrow Money

A= Actual M_2= Broad Money

The above table shows the implementation situation of the different monetary policy in Nepal. One of the objectives of monetary policy, price stability, was achieved as targeted only in the fiscal year 2003/04. In this year, the targeted inflation was 4.3 percent and actual inflation was 4 percent. Another objective of monetary police, economic

growth was achieved as targeted only in the fiscal year 2007/08. In this year the targeted growth was 5 percent and actual growth was 5.3 percent. The actual growth of narrow money supply (M_1) was less than targeted in the fiscal year 2002/03 and 2006/07. And the actual growth of narrow money supply (M_1) was more than targeted in the fiscal year 2003/04, 2004/05, 2007/08 and 2008/09. The actual growth of broad money supply (M_2) was less than targeted in the fiscal year 2002/03, 2004/05, and 2006/07. And the actual growth of broad money (M_2) is more than targeted in the fiscal year 2003/04, 2005/06, 2007/08 and 2008/09. The table presented above shows the central bank had hardly achieved its objectives. The table also revels that the planned growth rate of money supply, the main monetary tool that is used to attain the objectives had also been never realized. Either the growth rate of money supply was more than the targeted level or less than the targeted level. This may be one of the causes of not attaining the stated objectives. Moreover, if we consider monetarists' view, off the targeted growth rate of money supply is the main root cause of the problem. With other macroeconomic variables, the money supply has to be changed as planned to attain the macro-economic objectives of the monetary policy. To change money supply as planned, the contributions of the factors that determine money supply have to be properly understood. Hence present study is an attempt to study the factors affecting money supply and their contributions that is the magnitude and direction of their contributions.

However, there are a few studies covering these issues in the context of Nepal. Moreover, the empirical relationship may not be stable which again needs up dated information. Therefore the present study attempts to explore the way of solution in considering above problems.

1.3 Objectives

The main Objective of this study is to determine the role of the factors of money supply in Nepal. The Specific objectives are:

a) To study the factor determining money supply and to find out the exact relationship between money supply and factors determining it.

b) To study the factors determining money multiplier and to find out the exact relationship between money multiplier and factors determining it.

c) To study the factors determining high power money and to find out the exact relationship between high power money and factors determining it.

1.4 Hypothesis

a)   Money supply is positively related to monetary base.

b)   Money supply is positively related to money multiplier.

1.5 Significance of the Study

Though, huge amount of capital is needed for the fulfilment of the economic goals of an underdeveloped country like Nepal, more and more money supply will have dangerous side effects on the economic activities of the nation. The present study tries to examine the factors affecting money supply i.e. money multiplier and the high power money. Then after their it tries to examine the functional relationship between money multiplier and its determinants as well as high power money and its determinants.

1.6 Limitation of the Study

Since the data for money supply are available from the year 1957 to onwards our study covers only the period from 1980 to 2008. Our study covered only money multiplier and high powered money as a determine of money supply. Besides this money supply may be affected by numerous factors which will not covered in our study. Also Nepalese economy is continuously transformed from non-monetised economy to monetised economy which will consequently affect the money supply but our study may not cover this factors. Also the Indian currency is circulating in Nepalese economy which is not accounted in money supply.

1.7 Chapter Plan

This study has been divided into five chapters.

Chapter one deals the introductory part of the study which includes the main framework and basis of the study. In this chapter general background, identification of the problem, objective of the study, hypothesis, significance of the study, limitation of the study and chapter plan are presented.

Chapter two covers the review of literature in which both theoretical as well as national and international empirical reviews are presented.

Chapter three is related with the research methodology that has been followed in this study. In which the research design, scope of the study and data collection and analytical technique are presented.

In chapter four, the analysis is performed. In this chapter exact contributon of different factor of money supply is analyzed. The last chapter i.e. chapter five contains summary, conclusions and recommendation of this study.

CHAPTER - II
LITERATURE REVIEW

The theoretical as well as national and international empirical reviews give the framework about the money supply and its determinants. The theories on which empirical studies rest are quite important for a sound study. Hence this chapter includes the reviews of some of the relevant theories, international empirical studies and national empirical studies. The purposes of this chapter are : (a) to review the methods used to study money supply, (b) to determine the method that is relevant in Nepalese context and (c) to determine the factors that can be used in Nepalese context.

There has been a great deal of controversy in different schools of economist concerning the role of money in the economy. The classical economist believed that change in the stock of money doesn't affect real variables like employment and output. It affects only price level. They considered money merely as a medium of exchange. In the Keynesian frame work, the supply of money was not merely related to the price level, it was also related to the real variables of the economy. In the Keynesian framework, the impulses in the monetary sector are transmitted to the real sector indirectly through the interest rate. Keynesians believe that the stabilization of the economies require the use of fiscal as well as monetary policy. In contrast to the Keynesians, the modern quantity theorists believe that changes in the supply of money directly affect the real sector of the economy. They suggest that as the stock of money in the economy increased, it directly leads to an increase in the level of employment and output. They believe that monetary policy alone is sufficient to stabilize the economy. They give too much emphasis to the monetary policy.

2.1   Theoretical Reviews

There is considerable disagreement among economists on the definition of money. Some economist define money in narrow sense, where as others define it in a broader sense. In general, money is defined as any asset which performs simultaneously the functions of a medium of exchange, an unit of account and a store of value. But in practice there are other financial assets which perform these function greater or lesser degree. It is difficult to obtain an empirical measure of the money stock. One may distinguish four broad views regarding the definition of money supply. They are as follows:

a)   Traditional Approach

The traditional approach emphasized the medium of exchange function of money. This approach defines money narrowly to include the currency plus demand deposits. The traditional approach is analytically superior because it provides the most liquid and exact measure of money supply. But, this approach limits money supply to a very narrow area.

b)   Monetarist Approach

This approach is associated with Prof. Milton Friedman and other economist of the University of Chicago. They define money broadly to include currency plus demand deposit as well as time deposit of commercial banks. This approach lays emphasis on the store of value function of money and provides a broader measure of money.

c)   Gurley and Shaw approach

This approach is associated with the view of Prof. John J. Gurley and Edward S. Shaw. They have extended the scope of money supply by

including liabilities of non-banking intermediaries. To t hem money supply comprise of currency held by the people, demand and time deposits of the banks, plus saving bank deposits, shares, bonds etc. which are close substitutes to money.

d)   Radcliff Committee Approach

This approach provides much wider view of the concept of money supply. In this approach, the concept of money supply is viewed in terms of a general liquidity of the economy. According to this approach money supply includes cash all kinds of bank deposits, deposits with other institutions, near money assets and the borrowing facilities available to the people. Thus the money supply in this wider sense can not be successfully measured.

Friedman and Schwartz (1963) both defined money supply broadly to include time deposits at commercial banks. In the Friedman Schwartz study the stock of money (M) and changes in it are determined by three factors:

a) the amount of high- powered money,
b) the deposit reserve ratio (D/R) and
c) the deposit currency ratio (D/C).

The total amount of high powered money constitute the total amount of currency held by the public plus bank reserves. This total is called high power money because one rupees of such money held as bank reserve may give rise to the creation of several rupees of deposit. If there is no change in D/R and D/C any increase in the high powered money involves an equal percentage increases in the stock of money. The deposit reserve ratio is determined by the banking system through the combined

actions of individual commercial banks. The deposit currency ratio is determined by the public through the combined actions of individual holders of money.

The formula connecting them with the money stock is

$$M = H \frac{\frac{D}{R}(1+\frac{D}{C})}{\frac{D}{R}+\frac{D}{C}}$$

Where H is total high powered money, D is commercial bank deposits, R is commercial bank reserve and C is currency held by the public. Hence, they conclude that the simultaneous interaction of changes in high power money and the two ratios determine the changes in the stock of money.

The review helps to study the determinant of money supply. To find out the determinant of money supply, we should study about high powered money (H), the deposit reserve ratio (D/R) and the deposit currency ratio (D/C).

Mishkin (2000) Linked changes in the money supply to changes in the monetary base. This link is achieved by deriving a money multiplier. Money multiplier relates the change in the money supply to a given change in the monetary base.

The relationship among money supply (M), money multiplier (m) and monetary base (MB) can be expressed as follows.

M= mxMB

Size of the money multiplier is determined by three factors these are depositors' decision about their holding of currency and checkable

deposits reserve required imposed by the monetary authority and banks, decision about excess reserves also affect the money multiplier. Mishkin opined that an increase in the monetary base that goes in to currency is not multiplied where as an increase in that goes into supporting deposit is multiplied.

i.e. $MB = R + C = (r_D \times D) + ER + C$

where

r_D= required reserve ratio

D= deposit

ER= Excess reserve

C= currency

This occurs because such on increase leads to an identical increase in the right hand side of the equation with no change occruing in D. This equation also shows that an additional rupee of MB that goes into excess reserve ER does not support any additional deposits or currency.

Mishkin express money supply (M_1) algebraically as follows

$$M = \frac{1 + \dfrac{C}{D}}{r_D + (\dfrac{ER}{D}) + (\dfrac{C}{D})} \times MB$$

He split the algebric expression in to two parts, money multiplier (m) and monetary base (MB)

Here money multiplier

$$m = \frac{1 + \dfrac{C}{D}}{r_D + (\dfrac{ER}{D}) + (\dfrac{C}{D})}$$

He has expressed broad money supply M_2 algebraically as follows

$$M_2 = \frac{1 + (C/D) + (T/D) + (MMF/D)}{r_D + (ER/D) + (C/D)} \times MB$$

where T= time deposit

MMF= money market fund

To him money multiplier for M_2 money supply is

$$m_2 = \frac{1 + (C/D) + (T/D) + (MMF/D)}{r_D + (ER/D) + (C/D)}$$

In his model Mishkin found that the money multiplier and the money supply are negatively related to the require reserve ratio r_D. The money multiplier and the money supply are negatively related to the currency to demand deposit ratio C/D and the money multiplier and the money supply are negatively related to the excess reserve to demand deposit ratio ER/D.

In his model Mishkin found that the M_2 money multiplier and M_2 money supply are negatively related to the required reserve ratio r_D , the currency to demand deposit ratio C/D, and the excess reserve to demand deposit ratio (ER/D). And the M_2 money multiplier and M_2 money supply are positively related to both the time deposit to demand deposit ratio (T/D) and the money market fund to demand deposit ratio (MMF/D).

Mishkin viewed, that the central bank lacks complete control over the monetary base. He split the monetary base into two components one that the central bank can control completely that is non borrowed monetary base MBn and another that is less tightly controlled is also influenced by discount loans from the central bank. He concluded that the

money supply is positively related to the non borrowed monetary base MBn and to the level of discount loans DL from the central bank.

From the above review money multiplier (m) for the narrow money supply M_1 can be calculated with the help of required reserve ratio r_D, currency to demand deposit ratio C/D and the excess reserve demand deposit ratio ER/D. And monetary base can be calculate with the help of non borrowed monetary base MB_n and discount loans. Money multiplier for broad money (M_2) required knowledge about required reserve ratio, currency ratio, excess reserve ratio, time deposit ratio and the money market fund ratio.

Gupta (1982) Viewed that the supply of money is determined jointly by the monetary authority, banks and the public. Monetary authority plays the dominate role but the role of public and the banks can not be ignored. There are two kinds of money.

a) ordinary money (M), and
b) high powered money (H).

Ordinary money (M) is the sum of currency held the public and demand deposits of banks.

We can write M=C+DD……………………(1)

High powered money (H) is money produced by the central bank and the government and held by the public and banks. H is the sum of

i)   currency held by the public (C)
ii)   cash reserve of banks (R)

Then we can write

$$H = C + R \ldots\ldots\ldots\ldots\ldots(2)$$

The single most important and dominant factor that determines money supply is H. So Gupta call theory of money supply as H theory of money supply.

Gupta used H theory of money supply to analyze the determinants of money supply.

Gupta makes an assumption that the supply of H (H^s) is policy determined i.e.

$$H^s = \overline{H} \ldots\ldots\ldots\ldots(3)$$

The analysis of the demand for H (H^d) is much more important for the H theory.

It is assumed that currency demand (C^d) and demand for demand deposit (DD) will be highly correlated that C will be a proportional function of DD. This may be expressed as

$$C^d = c.DD \ldots\ldots\ldots\ldots(4)$$

Demand for reserve (R^d) is largely a proportational function of the total deposit of banks. This may be expressed as

$$R^d = r.D \ldots\ldots\ldots\ldots(5)$$

Demands for time deposit TD^d is an increasing proportional function of DD. this may be expressed as

$$TD^d = tDD \ldots\ldots\ldots\ldots(6)$$

Total deposit D is sum of demand deposit DD and the time deposit TD.

Then

$D=TD+DD$

From Equation (6)

$D= tDD+ DD$

$D= DD(t+1)$………..(7)

From equation (5) and (7)

$R^d== r(1+t)DD$…………….(8)

We know that

$H^d= C^d+R^d$

from equation (4) and (8)

$H^d= \{c+r(1+t) \} DD$………..(9)

Thus, $H^d=$ has been expressed as a function of DD and three behavioral ratios c, t and r.

The market for H will be in equilibrium when

$H^d= H^s$

or

$\{ c+r(1+t)\}.DD = H$

Then $DD=\dfrac{1}{c+r(1+t)}H$……………..(10)

from equation (1) and (4)

$$M= \frac{1+c}{c+r(1+t)} H \quad \ldots\ldots\ldots\ldots\ldots..(11)$$

The expression $\frac{1+c}{c+r(1+t)}$ gives the value of money multiplier. We shall denote it by m.

The equitation (11) is the H theory of money supply. It shows the supply of money a function of H and three behavioral ratios c, t and r .

The above equitation (11) can be written as

$$M= m (H)\ldots\ldots\ldots\ldots\ldots\ldots..(12)$$

The equitation (12) says that the determinants of the supply of money (M) can be classified under two main heads (a) those that affect H and (b) those that affect m.

The money multiplier (m) is a function of three behavioral asset ratios. c,t and r. They are called proximate determinates of m. They are affected by several rates of interest, the spread of banking facilities in the country and holding of black money etc.

High powered money (H) is the money produced by the monetary authority and held by the public and banks. There are five factors affecting H. These are:

a) Central Bank credit to government
b) Central Bank credit to Commercial bank
c) Central Bank credit to development bank
d) Net foreign exchange assets of the Central Bank and
e) Net non monetary liabilities of the Central Bank

This is the money supply model for India developed by Gupta.

From the above review we can conclude that determinants of money supply (M) can be classified under two main heads a) those that affect H and b) those that affect m .

Economist generally derive money supply model for M_1 and M_2 as follows :

Derivation of M_1

$$M_1 = m_1 x B \dots\dots\dots\dots\dots\dots(1)$$

$$M_1 = C + DD \dots\dots\dots\dots\dots\dots(2)$$

$$B = C + R \dots\dots\dots\dots\dots\dots(3)$$

Divide (2) by (3)

$$\frac{M_1}{B} = \frac{C + DD}{C + R}$$

Divide R.H.S by DD

$$\frac{M_1}{B} = \frac{\dfrac{C}{DD} + 1}{\dfrac{C}{DD} + \dfrac{R}{DD}}$$

$$Put \frac{C}{DD} = c \text{ and } \frac{R}{DD} = r$$

Then,

$$\frac{M_1}{B} = \frac{c + 1}{c + r}$$

$$M_1 = \frac{c + 1}{c + r} x B$$

From Equation one

Money multiplier $(m_1) = \dfrac{c + 1}{c + r} \dots\dots\dots\dots\dots(4)$

With the help of above equation we can say

1) M₁ and B are positively related i.e. as B increase M₁ increase.

2) The decrease in the reserve-deposit ratio (r) and currency deposit ratio (c) raise the money multiplier and money supply hence (c) and (r) have negative relationship with money supply.

Derivation of M_2

$$M_2 = m_2 \, xB \dots\dots\dots\dots(5)$$

$$M_2 = C + DD + TD \dots\dots\dots\dots(6)$$

$$B = C + R \dots\dots\dots\dots(7)$$

Divide (5) by (6)

$$\frac{M_2}{B} = \frac{C + DD + TD}{C + R}$$

Divide R.H.S by DD

$$\frac{M_2}{B} = \frac{\dfrac{C}{DD} + \dfrac{TD}{DD} + 1}{\dfrac{C}{DD} + \dfrac{R}{DD}}$$

$$Put \frac{C}{DD} = c \text{ and } \frac{R}{DD} = r \text{ and } \frac{TD}{DD} = t$$

Then,

$$\frac{M_2}{B} = \frac{c + t + 1}{c + r}$$

$$M_2 = \frac{c + t + 1}{c + r} \, xB$$

From Equation (5)

Money multiplier (m_2) = $\dfrac{c + t + 1}{c + r}$ …………………..(8)

With the help of above equation we can say.

1) M_2 and B are positively related i.e. as B increases M_1 increases.

2) The decrease in the reserve deposit ratio (r) and currency deposit ratio (c) raise the money multiplier and money supply hence (c) and (r) have negative relationship with money supply. An increase in time deposit to demand deposit ratio (t) raises the money multiplier because reserve ratios on time deposits are lower than those for demand deposits.

2.2   Empirical Review

2.2.1 International Empirical Review

Kim (1966) examined the contributions of the determinants to the rate of change in the money stock in case of Korea for the period 1954 to 1969. For him monetary authority, commercial banks and the public jointly determine the amount of money supplied in the country. Four variables the quantity of high power money (H), the currency to demand deposit ratio (c) , the reserve to demand deposit ratio (r) and time to demand deposit ratio (t) jointly determine the money stock M_1. Similarly currency to demand deposit ratio (c) , reserve to demand deposit ratio (r) and high power money (H) jointly determine money stock M_2.

The identity equation he has used to derive the M_1 money supply was:

$$M_1 = \frac{H}{C_1 + r_2(1+t)(1-c_{1)}}$$

Similarly, the identify equation he has used to derive the M_2 money supply was:

$$M_2 = \frac{H}{C_2 + r_2(1 - c_2)}$$

With the help of the above equations he has found the contribution of each determinant to the rate of change in M_1 and M_2 money stocks. He has found that for the entire period the relative contribution of high-powered money to M_1 money supply is more than 100 percent and the relative contribution of high powered money to M_2 money supply is approximately 8o percent. Before 1965, the large growth of high-powered money occurred chiefly because of government deficit financing and after 1965, the main source of the increase in high powered money was the net acquisition of foreign assets.

The relative contribution of the currency ratio was not systematic, both positive and negative contribution occurring. The long run contribution of the currency ratio is quite small, particularly in case of M_1, however, the contribution in case of M_2 is 12.5 percent. The contribution of the reserve ratio also largely offset each other over the study period. Finally, the negative contribution of shifts from demand to time deposit is an important element in explaining the change in the M_1 money stock.

High power money dominated long run movement in the rate of change in the money stock. But the variability of the currency ratio indicates that the currency ratio has a greater effect in explaining short run variability of the money supply than long run behaviour of the money supply.

In conclusion the monetary management of Korea has been focused on the discussion of high powered money and the reserve ratio even in the short run, while the currency ratio has received little attention. One reason may be the fact that sources of variation in the currency ratio involve actions of innumerable holders of money and are difficult to explain.

Islam (2008) investigates the dynamic relationship among the money multiplier (mm) and reserve money (RM) components in the money supply in Bangladesh by employing structional vector auto regression (SVAR) model using quarterly data for the period 1979 to 2007.

The analysis of impulse response and variance decomposition of money multiplier shows that currency deposit ratio has a significance influence on money multiplier. Although the ratio is not controlled directly by Bangladesh Bank, its stability has significance implications in deterring money supply. This analysis shows that reserve deposit ratio has a persistent impact on money multiplier as compared to currency deposit ratio. Bangladesh Bank influences it by changing cash reserve requirement ratio (CRR). The excess reserve deposit ratio for the banks shows significant persistent impact on money multiplier.

The dynamic relationship based on impulse response and variance decomposition among the components of reserve money show that net foreign asset and net government borrowing have a greater influence in changing the reserve money. These determinants are however beyond the control of Bangladesh Bank. The movement of net foreign asset depends on the over all performance of the country's external sector. The government borrowing from Bangladesh Bank, on the other hand,

originates from the budget deficit and remains a major factor in determining the movement of reserve money. The analysis shows that both net foreign asset and government borrowing loosens the degree of controllability of Bangladesh Bank over reserve money.

The estimated impulse response and the variable decomposition of reserve money shows that the borrowing of commercial banks have a systematic impact on reserve money. The Bangladesh Bank has power to influence such borrowing by changing the bank rate or discount rate.

In conclusion the currency deposit ratio component in the money multiplier and net government borrowing and movement of net foreign asset components in reserve money are the major contributors to changes in money supply. Since these components limit the degree of controllability of Bangladesh Bank over money supply, the conduct of prudent monetary policy in Bangladesh would crucially depend on taking into consideration the implications of changes in these key components.

2.2.2 National Empirical Review

Upadhyay (1978) analysed the determining factors of money supply in Nepal. The objectives of this study are to study the change of money supply trend and factors affecting it, to fit the money multiplier model for Nepal, to evaluate some of the determinants of inflation in Nepal and to test the applicability of the model for forecasting the consequences of the policy.

According to him the computed value of money multiplier is useful because with multiplication of high powered money, it redefines money supply in Nepal. In Nepal, due to fragmented economy and an open border with India, money supply is also determined exogenously to

a great extent. There are various factors, internal and external, affecting money supply.

Upadhyay found that the currency to demand deposit ratio, a component of money multiplier, positively related to the opportunity cost of holding currency as measured by commercial banks loan rates. The empirical result has shown that a 10 percent increase in commercial banks loan rate increases currency deposited ratio by 4.3 percent.. But the ratio is highly related to GDP. Empirical result shows that a 10 percent increases in GDP causes to decreases this ratio by 24 percent. Another component of money multiplier, excess reserve to demand deposit ratio, is positively related to commercial banks loan rates. Empirical result shows that a 10 percent increase in domestic interest rate increases this ratio only by 0.7 percent. This ratio is negatively related with Indian bank rate.

The net foreign asset, a component of high power money, has positive effect on money supply. In the study period, the net foreign asset has increased in a consistant manner which is one of the main factors expanding the volume of money supply in Nepal. Another component of higher power money, domestic credit is positively related with money supply in Nepal. Domestic credit had been divided into three major groups namely net claims on government, net claims on government enterprises and claims on private sector.

Pant (1979) in his study has explained the process that is used to determine money supply in Nepal. Besides this he has also identified the base model to estimate money supply in Nepal. With the help of this model he has estimated money supply of Nepal for the period 1970 to 1978. The objective of this study is to study the determinants of money

supply, monitory base and money multiplier and to develop the econometric model of money supply in Nepal. He has tested different econometric models i.e. linear model, log linear model and stock adjustment lagged model. Among these three econometric models he has found the log linear model as the best estimating model of money supply. It is because log linear regression equation gave a better result than linear and stock adjustment lagged model.

According to him money supply is determined by two variables i.e. the monetary base and the money multiplier. Empirical result found by him suggests that the monetary base is the most important determinant of money supply. Pant argues that the net foreign assets of the central bank are the most important determinants of monetary base. It is because the value of net foreign assets is much higher then the net domestic credit. The empirical result found by Pant suggests that the reserve to total deposit ratio is the most important determinant of money multiplier because this value is higher than other determinants i.e. time deposit to demand deposit ratio and currency to demand deposit ratio. Pant has argued that to control money supply monetary authority must control the monetary base.

Kayastha (1981) analyzed the determining factors of money supply by developing a money multiplier model for Nepal for the study period 1957-1979. The objectives of this study are to study the factors determining money multiplier and high power money, to find out the exact relationship between money multiplier and its determining factors, to find the exact relationship between high powered money and its determining factors, to develop money multiplier model for Nepal and to provide the government with a tool for controlling money supply in the economy. He has used semi- log linear equation to estimate money

supply in Nepal. The study indicated that money supply as well as its components i.e. currency and demand deposits are increasing form year to year in the study period. The study found that among the various factors affecting money supply, net foreign assets, net claims on government enterprises, claims on private sector, time deposit and net capital and other unclassified liabilities, net claims on government has the highest growth rate and the net foreign assets had the lowest growth rate during the study period. Kayasthe has found that an unit of increase in c and r ratio may decrease the money multiplier by 0.1105 and 0.5540 unit respectively. And he has found that an unit of increase in NFA and NDC may increase the high power money by 0.5791 unit and 0.2049 unit respectively.

Kaystha analyzed the best determinants of the money multiplier and their functional relationship in absolute as well as in changed form. In the context of Nepalese economy the value of the money multiplier is mostly determined by the currency to demand deposit ratio and the bank reserves to demand deposit ratio. The money multiplier was negatively as well as significantly affected by these two ratios during the study period. But the effect of the reserve to demand deposit ratio on money multiplier had greater significance then that of currency to demand deposit ratio. He has found the value of money multiplier stable in our economy, so according to him money multiplier and its components can not be used as an effective tool for controlling money stock in the economy.

Other important determinant of money stock, i.e. high power money, is determined by the value of net foreign assets and the net domestic credit. Kayastha has found that net foreign assets is the most important determinant of high powered money in absolute form and net domestics credit is in changed form. According to him net foreign asset

can not be taken as an effective tool for controlling the quantity of high power money because the value of net foreign assets change from changes in the balance of payments situation which is beyond the control of the monetary authority.

Analysing net domestic credit as the determinants of the high power money the claims on private sectors had the most expansionary effects on the high power money in absolute form. But in the changed form, net claims on government and claims on private sectors yielded expansionary effect on the high power money.

In conclusion the money multipliers in Nepal are relatively stable, hence the monetary authority should control the money supply by controlling the high power money. Though, net foreign assets are the best explanatory variable of the high power money, it lies beyond the control of monetary authority. Among the components of net domestic credit, claims on private sector had the most expansionary effect on the high power money. Thus, in order to control money supply claims on private sector mostly of commercial banks should be controlled.

Sharma (1987) studied the monetary structure of the Nepalese economy. The purpose of this study, in general, is to identify those necessary conditions in Nepal which are required for an effective control over money supply. The ultimate effect of which is on the level of economic activities.

He has used two types of models in the log form and has analyzed the data for the period 1965 to 1982 in the first model and 1965 to 1980 in second. In the first model the explanatory variables were net foreign assets with monetary authority, (NFAM) and commercial banks' borrowing from Nepal Rastra Bank. Similarly in the second model the

explanatory variables are net foreign assets with monetary authorities, Commercial Banks borrowing from NRB and fiscal deficit of the government.

Sharma also studied the determinants of money supply (M_1) in Nepal. Sharma viewed that analyses of the whole process of money supply changes require an understanding of how institutional, economic and international forces are operating to influence money supply. This is explained by the money multiplier theory. For the control of money supply separation of forces in terms of public and bank behaviors working through m and monetary authority's actions measured by the amount of high powered money supplied to the system for both the public and banks and their uses is needed. According to him the theory whose help is needed for this purpose is:

$$M_1 = m.H$$

Where

$$m = \frac{1+k}{r^{D}CN(1 + d_2 + gd) + k}$$

or

$$m = \frac{1}{r^{D}CN(1-c)+c}$$

Since 'm' is determined endogenously by bank and public actions and where H has both the autonomous and induced influence on factors governing it. Among the various sources of money supply changes, the NFAM in Nepal is the most important factor to generate H. Money supply changes through reserve ratio changes because Nepalese commercial banks are holding excess reserves.

To know the money supply response to change in money multiplier (m) and change in monetary base (H) in Nepal, the knowledge about the contribution of m and H to the percentage change in money supply is required. To study the relative contribution of H and m to money supply and to understand whether their role in money supply process is systematic, Sharma refers to follow the rules developed by Ahrensdrof and Kanesathasan , 1960-61.

The rule developed by Ahrensdrof and Kanesathasan is as follows:

1. $\Delta M_t^s = M_t^I + \Delta M_t^{II}$

Where,

2. $M_t^I = \Delta ML_t . m_{t-1}$

3. $\Delta M_t^{II} = ML . \Delta m_t$

Substituting (2) and (3) into (1) we get

4. $\Delta M_t^s = \Delta ML_t m_{t-1} + ML . \Delta m_t$

where m= $\dfrac{1}{c + r^D CN(1-c)}$

The M_t^i measures the change in money supply (ΔM_t^s) due to change in the liabilities of monetary authorities (ML), while (ΔM_t^{II}) measures the change in money supply due to change in money multiplier (Δm). Equation 4 above shows the total change in money supply resulting from (ΔM_t^s) and (ΔM_t^{II}) separately. The relative contribution of H and m to the change in money supply have been computed following the above procedure for the period under review. The result has been used for generalizing the role of H and m in money supply process.

According to Sharma there are some major determinants of high power money through whose regulation the NRB can extert a direct pressure on money supply. The net foreign assets, the monetary or the fiscal deficit of the government and credit supply to banking and private sectors are the major determinants of high powered money. Sharma has found that on the average, the contribution of the NFA to the RM was 95 percent during 1964-81. On the average, the holding pattern of RM between 1964-82 shows that only 15 percent of it is annually absorbed by banks, where as 85 percent of the reserve money is held by public alone. This shows only 15 percent of RM is active to create multiplier effect on the Nepalese monetary system.

In conclusion the net foreign assets with monetary authorities (NFAM) are, endogenously determined by the balance of payments (BOP) while fiscal deficit of the government is out of central bank's control. Thus, in order to control money supply NRB should control credit to commercial banks and private sector.

Dhakal (2001) has analyzed the determinants of money supply in Nepal. He has tried to find the value of money multiplier. It covers 25 years from 1975 to 1999. The objective of this study are to find out the determining factors of money supply, money multiplier and monetary base, to find out the relationship between money supply and its determining factors, money multiplier and its determining factors and monitory base and its determining factor.

According to his findings reserve money is the major determinant of money stock in Nepal. In case of narrow money multiplier its value is greater then unity for most of the year of the study period. This implies that reserve money is the dominant determinant of narrow money stock.

For the year 1991, 1995 and 1997-1999 narrow money multiplier is less than unity, this shows there is no positive role of money multiplier to create narrow money supply. It is because of an increase in currency ratio and reserve ratio. The volume of narrow money multiplier ranges between 1.185 to 0.937 in the study period.

Dhakal found that broad money multiplier on the average increasing though there are intermittent ups and down throughout the study period. It was 1.7511 in 1975 that increased to 2.3751 in 1985 and 2.927 in the year 1999. The board money multiplier indicates that the desire of people shifted towards time deposit during the study period. The value of broad money multiplier was more then two in the study period, that indicates that the reverse money is the major determinant of broad money stock, in Nepal. The study found that foreign asset and net credit to government are two fundamental determinants of reserves money and there by money supply in Nepal. In 1975 about 65 percent of total reverse money was covered by net foreign assets. This has reduced to about 20 percent in 1985. Again it started to increase from 1985 which reached to 100 percent in the year 1999. The net credit to government on the other hand increased to 86 percent in the year 1985 and it started to decline from 1985 and reached to 45 percent in 1999. Dhakal found fluctuating trend in currency ratio. It was 2.1759 in the beginning and it was 1.723 in 1983 which is the lowest value in the study period. There is increasing trend in deposit ratio due to this reason broad money has increased in the study period.

In conclusion change in money multiplier has a minor impact on changes in money stock in comparison to the changes in reserve money. So reserve money management is more important than money multiplier management to control the total money stock.

Paudel (2002) has analyzed the proximate and ultimate determinants of money stock in Nepal. He has also attempted to discuss the available approaches of money supply: an accounting approach and money multiplier approach. The study has tried to find whether the determinants of money stock are autonomous variable or policy induced variables. The analysis of the money supply process has been divided into two parts, descriptive analysis and ratio analysis. Most of the analysis of the study was descriptive in nature.

Paudel has found reserve money as the dominant determinants of money supply. The share of RM in narrow money (M_1) was 81.2 percent in 1981 and it increased and reached to 100.3 percent in July 2000. The RM to M_1 ratio was 94.4 percent in 1985 and it increased to 97.9 percent in 1990 and increased to 103.7 percent in 1995. The ratio analysis performed by Paudel shows that the reserve money has been the dominant determinant of narrow money stock. RM has been the major determinant of broad money (M_2). The reserve money to M_2 ratio was 46.7 percent in 1981 and it was 39.2 percent in July 2000. The declining RM to M_2 ratio shows the strong growth in time deposits during the study period. The reserve money is highly influenced by the net foreign assets and net domestic credit. Money supply is highly influenced by the balance of payment position of the country through reserve money. The relative contribution of NFA and NDC in RM was 95 percent on average.

The study found that the money multiplier is relatively stable in Nepal. The value of multiplier has been less than one in some years. Currency ratio and reserve ratio are the major determinants of money multiplier and other factors like time deposit ratio and other deposit ratio also affect the determinant of money multiplier. The study found out that the contribution of currency ratio (C) to m was positive for 10 years

and negative for 10 years of the 20 years of study period and the average contribution was negative. The ratio analysis of reserve to demand deposit ratio was 0.4035 in 1980 and it increased to 0.6496 in 1985 and reached to 0.7393 in 1990. The reserve to demand deposit ratio declined from 0.054 in 1980 to 0.042 in 1985. Time deposit to demand deposit ratio was 2.38 in 1980 July and went up to 6.643 in July 2000.

In conclusion, there was no positive role of money multiplier to determine money supply in Nepal. In the study period there was a high reserve of commercial banks than demand deposits with them. The foreign assets are the largest positive factor of the monetary base as well as money supply. Net claim on government is the second largest expansionary factor of money supply.

The above theoretical reviews give conceptual frame work to study the determinant of money supply in Nepal. According to Friedman and Schwartz study the stock of money (M_1) and changes in it are determined by three factors: the amount of high- powered money (H), the deposit reserve ratio (D/R) and the deposit currency ratio (D/C). According to Mishikin the narrow money (M_1) is affected by required reserve ratio r_D, currency to demand deposit ratio C/D the excess reserve to demand deposit ratio ER/D, the non borrowed monetary base MBn and discount loans DL. To him broad money (M_2) is affected by required reserve ratio r_D currency to demand deposit ratio C/D, excess reserve ratio ER/D, time deposit ratio T/D and the money market fund ratio MMF/D. According to Gupta the determinant of money supply can be classified under two main heads (a) those that affect H and (b) those that affect m.

Kim find out that high power money dominated long run movement in the rate of change in the money stock. And the currency

ratio has grater affect in explaining short run variability of the money supply than long run. Islam has found that the currency deposit ratio component in the money multiplier and net government borrowing and movement of net foreign asset components in reserve money are the major contributors to change in money supply.

Sharma has found that there are some major determinants of high power money through whose regulation the NRB can extert a direct pressure on the money supply. Among them the net foreign asset with monetary authorities (NFAM) and fiscal deficit of the government is out of central bank's control. Thus in order to control money supply NRB should control credit to commercial banks and private sectors. Pant has found that the reserve to total deposit ratio is the most important determinant of money multiplier. He has argued that to control money supply monetary authority must control the monetary base. Kayasth has found that the money multiplier in Nepal are relatively stable, thus the monetary authority can control money supply by controlling the high power money. Though net foreign assets are the best explanatory variable of the high power money but it lies beyond the control of monetary authority. Thus to control money supply claims on private sector mostly of commercial banks should be controlled. Upadhya has argued that there are various factors internal and external affecting money supply in Nepal. He has found that the net foreign asset has increased in a consistent manner which is one of the main factors expanding the volume of money supply. Poudel has found that there was no positive role of money multiplier to determine money supply in Nepal. The foreign assets are the largest positive factor of the monetary base as well as money supply. Net claim on government is the second largest expansionary factors of money supply. Dhakal has found that money multiplier has a minor impact on

changes in money stock in comparison to the changes in reserve money. So reserve money management is more important than money multiplier management to control the total money stock.

From the above theoretical reviews we know the different factors which contribute money supply. International empirical reviews give information about the contribution of different factors in determining money supply in different country. The above national empirical reviews give the information about role of different factors to determine money supply in Nepal at different periods. These reviews give actual figure that what has been done and what is left behind.

CHAPTER - III
RESEARCH METHODOLOGY

This chapter contains the research methodology that is going to be employed in this study. The main objective of this chapter is to present the main methodology and procedure of doing the study related to the field of money supply in case of Nepal.

3.1 The Research Design

The research is especially designed to estimate the role of different factors that determine money supply in Nepal. The whole study comprises various factors of money supply determination and their respective influence on money supply. While doing so, various factors that determine money supply are identified first and causal relationship are estimated.

3.2 Scope of the Study

This study covers from 1980 A.D. to 2008 A.D. Total money supply in each year and contribution of its determinants for the sample period has been collected from quarterly economic bulletin of the Nepal Rastra Bank.

3.3 Collection of Data

The present study is based on secondary data. The information that are essential for this study to fulfill the stated objectives are especially collected from different issues of quarterly economic bulletin a quarterly publication of NRB. The additional information were collected from

different issues of NRB monetary policies, NRB Samachars, Journals, Reports, Budget Speech of Nepal Government.

3.4 Data Analysis

After the collection of data from different sources, the data were processed by using various statistical tools like measure of central tendency, measure of dispersion, etc. The determinants of money supply and money multiplier are technical in nature. Hence, the determinants of these variables were selected with the help of contemporary monetary theories. Hence, the contribution (i.e. magnitude and direction) of the determinants of money supply and money multiplier are estimated, in this study. To attain this objective linear regression equations are used. To test the efficiency of the estimated regression equations various statistical test like t-test, f-test, D-w test, R^2 and $\bar{R}^2$ are used.

3.5 Approach to the study of Money Supply

In the content of developing countries there are essentially two main approaches to money stock determination. The money multiplier approach and balance sheet or structure approach. The money multiplier approach focuses on the relationship between stock and reserve money, while structural approach favor analysis of individual items in the balance sheet of consolidated monetary sectors in explaining variation in the money stock.

Money Multiplier Approach

In its simple form the money multiplier approach is based on the following equation:

$$M = m \cdot B \dots\dots\dots\dots(1)$$

Where,

> M= money supply

> m= money multiplier

> B= monetary base

This equation states that money stock is simply a multiple of the monetary base.

This general formula of money multiplier approach suggest that determinants of the money stock can be classified into two broad group (i) those that affect the monetary base and (ii) those that affect the money multiplier.

Before proceeding further it may be useful to clarify the concept of monetary base (B), narrow money (M_1) and broad money (M_2).

Monetary base (B) includes currency held by the public (C) and the reserve money of commercial banks ((R). Symbolically

$B = C + R$ …………… (2)

The monetary base is also called the reserve money or the high power money, because deposits are some multiple of the banks reserve through the process of multiple deposit creation.

Narrow money (M_1) consists of currency held by the public and demand deposit held at commercial banks. Symbolically

$M_1 = C + DD$ ……………. (3)

Broad money (M_2) consists of M_1 plus time deposits held at commercial banks (TD). Symbolically;

$M_2 = M_1 + TD$ ………….. (4)

3.6 Sources of Changes in Monetary Base

Changes in monetary base (B) occur as a result of transaction of the NRB with the rest of the economy. This transaction can be divided into six sections: namely credit to the government, government enterprises, commercial banks, private sectors and the foreign sectors. Changes in financial assets occur as a result of the changes in net foreign assets (NFA), net credit to the government (NCG) , credit to the government enterprises (CGE) credit to the commercial banks (CCB), credit to private sectors (CPS) net other asset (NOA) and capital and reserved (C and R). The sources of monetary base are derived as:

$$B = NFA + NCG + CGE + CCB + CPS + NOA + C \text{ and } R$$

Sources of change in B are not completely policy controlled as the behavior of the commercial banks and the public in particular is hardly within the control of monetary authority however the behavior of the government is policy controlled. The sources of high powered money are analyzed in details in the following section.

Net Foreign Assets (NFA)

Changes in NFA of the monetary authority occur from its foreign exchange transaction with the rest of the world. The NRB is the sole custodian and controller of foreign exchange reserves in Nepal. The balance of payments has a direct impact on the foreign exchange reserves and hence on high powered money.

Net Credit to the Government (NCG)

NRB claims on the government consist of government treasury bills, developments bonds, other special bonds, promissory notes, coins (

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issued by the governments) in circulation and the over draft uses by the government. As the NRB is given the responsibility of internal debt management of the government, it has not only to float the issue in the market but also to hold them if the market response is not sufficient to absorb the issues.

Credit to Government Enterprises (CGE)

Government enterprises can be broadly categorized into financial and non financial ones. It is the financial institution which mostly enjoys credit from the NRB.

Credit to Commercial Banks (CCB)

There are two ways of financing the credit demands of the commercial banks: direct loans and advances and lending against government securities. As a measure to ensure liquidity of the government securities, the commercial banks were facilitated to pledge their securities to the NRB to attain lending funds at an interest rate slightly higher than the interest rate fixed for the securities**.**

Credit to the Private Sector (CPS)

NRB's claims on the private sector arise out of internal bills purchases and loans and advances to privates organization and individuals.

Net other Assets (NOA)

Net other assets are the excess of other assets of the NRB over other liabilities.

Capital and Reserve (C and R)

Capital and reserve is the non monetary liabilities of monetary authority.

3.7   Sources of Changes in Money Multiplier

The money multiplier theory of money supply can be explained symbolically for available measure of money supply.

$M_1 = m_1 x B$………………. (5)

Where, m_1 is the money multiplier for narrow money.

The equation (5) states that m_1 is the function of m1 and B. If the value for m_1 is given the movement in M_1 is traced on the movement in B. In accounting sense m_1 is the ratio of M_1 to B. This can be written as

$$m1 = \frac{M1}{B} \text{.................(6)}$$

As M_1 and B are already defined, equation 6 can be written as

$$m1 = \frac{M1}{B} = \frac{C+DD}{C+R} \text{.................(7)}$$

Dividing the right hand side of the equation (7) by DD we obtain

$$m1 = \frac{\dfrac{C}{DD} + \dfrac{DD}{DD}}{\dfrac{C}{DD} + \dfrac{R}{DD}} \text{.................(8)}$$

Equation (8) can be written as

$$m1 = \frac{c+1}{c+r} \text{.......................(9)}$$

Where c is currency ratio and r is reserve ratio.

Substituting equation (9) for m_1 in equation (5) we obtain

$$M1 = \frac{c+1}{c+r} xB$$

Similarly, we can write behavioral money multiplier equation for broad money (M_2) as

$$m2 = \frac{M2}{B} \dots\dots\dots\dots(10)$$

Where, m_2 is the money multiplier for broad money M2. Value for m2 is derive as

$$\frac{M_2}{B} = \frac{C + DD + TD}{C + R} \text{ --------------- (11)}$$

Where TD is time deposits

Dividing the right hand side of equation (11) we obtain

$$m2 = \frac{\dfrac{C}{DD} + \dfrac{T}{DD} + \dfrac{DD}{DD}}{\dfrac{C}{DD} + \dfrac{R}{DD}} \dots\dots\dots\dots(12)$$

Where t= time deposit ratio

Equation (12)can be written as

$$m2 = \frac{c+t+1}{c+r} \dots\dots\dots\dots(13)$$

Substituting equation (13) for m_2 in equation (10) we obtain

$$M2 = \frac{c+t+1}{c+r} B \dots\dots\dots\dots(14)$$

Variation in money multiplier is thus related to three key ratios; c, t and r. they are called the proximate determinants. They are not the ultimate determinants of money multiplier because the ratios are themselves behavioral in character.

Currency Ratio

The money stock is negatively related to the currency demand deposit ratio C/DD) because rise in the currency demand deposit ratio brings about shift from deposit to currency and since deposit undergo multiple expansion while currency does not, this result contraction of the money multiplier and of the money stock. The currency ratio increases when the non back public's preference for currency relative to demand deposit increases.

Time Deposit Ratio

Typically, reserves ratios on time deposits are lower than those for demand deposits. In that case, an increase in (TD/DD) ratio raises the availability of free reveres and consequent enlargement of the volume of multiple deposit expansion leads to monetary expansion. The factors affecting the time deposit ratio are income, the interest rate on time deposit and market rate of interest etc.

Reserve Ratio

The cash reserve ratio is also an important determinant of the quantity of money in an economy. There are two elements in total cash reserves position of commercial banks these are required reserves and excess reserves. Thus total reserves consists of require reserves and excess reserve. The money stock is negatively related to reserve ratio.

3.8   Model Specification

In order to estimate casual relationships between money supply with its determinants, monetary base with its determinants and money multiplier with its determinants, we employ a log linear model, which is estimated by ordinary least square (OLS) method.

Estimation of Narrow Money (M_1)

To quantify the casual relationship between narrow money with money multiplier and monetary base, we employ a log linear model:

$$\ln M_1 = r + s_1 \ln m_1 + s_2 \ln B + u$$

Where

$\ln M_1$= natural log of narrow money (M_1),

$\quad$=constant,

$\quad_1$= coefficient of $\ln m_1$,

$\ln m_1$= natural log of narrow money multiplier,

$\quad_2$= coefficient of $\ln B$,

$\ln B$= natural log of monetary base,

u= error term.

Estimation of Broad Money

To quantify the casual relationship between broad money with money multiplier and monetary base, we employ a log linear model.

$$\ln M_2 = r + s_1 \ln m_2 + s_2 \ln B + u$$

Where

$\ln M_2$= natural log of broad money (M_2),

$\quad$=constant,

$_1$= coefficient of ln m$_2$,

lnm$_2$= natural log of broad money multiplier,

$_2=$ coefficient of ln B,

lnB= natural log of monetary base,

u= error term.

CHAPTER - IV
ANALYSIS OF THE STUDY

The money multiplier theory of money supply states that money supply is the function of reserve money and money multiplier. Thus it is clear that there are two proximate determinants of money supply reserve money and money multiplier. The general equation of money supply $M = mx\ RM$ says that the determinants of the supply of money (M) can be classified as :

i.   those factors affecting RM i.e., NFA and NDA and

ii.   those factors affecting money multiplier i.e. currency ratio, reserve ratio and time deposit ratio.

4.1   Contribution of Monetary Base to Money Supply

Money supply is positively related to the monetary base. Since money supply is the product of monetary base and money multiplier. An increase in the monetary base brings about an increase in the money supply.

Table No. 4.1

Share of RM in M_1 and M_2 (In percent)

(Rs in Million)

Year	In M_1	In M_2
1980	87.22	46.71
1985	94.48	42.1
1990	97.90	44.13
1995	99.09	40.36
2000	100.03	32.78
2005	96.34	32.13
2008	93.68	29.18

Source : Quarterly Economic Bulletin, NRB, 2009.

In the table 4.1, the share of reserve in the stock of money shows that there is intermittent change in the contribution of RM to money stocks. The share of RM in M_1 was 87.22 percent in 1980 and it gradually increased and reached to 100.03 percent in 2000 and then it started to decrease and reached to 93.68 percent in 2008. It was 94.48 percent in 1985, 97.90 percent in 1990 and 99.09 percent in 1995. This clearly shows that the reserve money has been the dominant determinant of narrow money stock. Share of RM in 2000 shows in that particular year the reserve money stock appeared larger than narrow money stock having no positive role for money multiplier.

The analysis shows that there are intermittent ups and downs in the contribution of reserve money to broad money M_2. The contribution has decreased from 46.71 percent in 1980 to 29.18 percent in 2008. The contribution of RM in M_2 was 42.1 percent in 1985, 44.13 percent in 1990, 40.36 percent in 1995, 32.78 percent in 2000 and 32.13 percent in 2005. Expect from 1985 to 1990, the contribution of RM on M_2 has gradually decreased. In 2008, it has decreased to 29.18 percent which is the lowest in the study period. The decrease in contribution of RM to broad money stock shows the strong growth in time deposit during the study period. However, RM has been the major determinant of broad money stock M_2.

4.1.1 Contribution of Net Foreign Asset in RM

While analyzing reserve money (RM), it is found that the Net foreign assets of the NRB has been one of the major determinants of reserve money growth in Nepal. The NFA is more or less autonomous factor affecting money supply.

Table No. 4.2

Share of NFA in RM

(Rs in Million)

Year	RM	NFA	% share of NFA on RM
1980	2468.6	1746.7	70.76
1985	5177.3	1026.3	19.82
1990	13924.8	7231.6	51.93
1995	32686.3	32338.4	98.94
2000	61003.7	65284.8	107.02
2005	96539.2	103854.2	107.58
2008	144591.7	164656.6	113.88

Source : Quarterly Economic Bulletin, NRB, 2009.

In Table 4.2, we can see the contribution of NFA to RM shows that there are intermittent ups and down in the study period. The share of NFA was 70.76 percent in 1980 and it decreased to 19.82 percent in 1985. Then it increased and reached to 113.88 in 2008. It was 51.93 in 1990, 98.94 in 1995, 107.02 percent in 2000 and 107.58 percent in 2005. The average relative contribution was 41.14 percent in 1980/89, 95.19 percent in 1990/99 and 110.06 percent in 2000/08. The average contribution remained 103.09 percent in the whole study period. It indicates, in Nepal, NFA is the main component of RM. In other words NFA, plays a significant role in the determination of money supply, in Nepal.

4.1.2 Contribution of Net Domestic Assets (NDA) in RM

NDA is another source of reserve money. NDA is the positive summation of the NRB credit to the government, government enterprises,

commercial banks, private sector and net other assets and negative summation of capital and reserves.

Table No. 4.3

Share of NDA in RM

(Rs in Million)

Year	RM	NDA	% share of NDA in RM
1980	2468.6	721.9	28.24
1985	5177.3	415.1	80.18
1990	13924.8	6693.2	48.07
1995	32686.3	347.9	1.06
2000	61003.7	-4281.1	-7.02
2005	96539.2	-7315.0	-7.58
2008	144591.7	-20064.9	-13.88

Source : Quarterly Economic Bulletin, NRB, 2009.

Going through the Table 4.3 it can be seen that the contribution of NDA to RM shows that the share of NDA was 28.24 percent in 1980 and it increased to 80.18 percent in 1985. Then it started to decrease and reached to 1.06 percent in 1995. The contribution of NDA to RM became negative in 2000. It was -7.02 percent in 2000, -7.58 percent in 2005 and -13.88 percent in 2008. The average relative contribution was 58.86 percent in 1980/89, 4.81 percent in 1990/91 and -10.06 percent in 2000/08. The average contribution of NDA remained 3.09 percent in the whole study period. The analysis shows that the share of NDA to RM is decreasing. This implies that the contribution of NDA in money supply is significant but it can be in both directions.

4.1.3 Contribution of Net Credit to Government (NCG) in RM

The NCG is one of the components of net domestic asset and then reserve money. An increase in this item gives rise directly to an increase in the monetary base.

Table No. 4.4

Share of NCG in RM

(Rs in Million)

Year	RM	NCG	% share of NCG in RM
1980	2468.6	887.1	35.94
1985	5177.3	4473.8	86.41
1990	13924.8	10357.8	74.38
1995	32686.3	16993.4	51.99
2000	61003.7	20065.9	32.89
2005	96539.2	20260.9	20.99
2008	144591.7	19990.8	13.85

Source : Quarterly Economic Bulletin, NRB, 2009.

The analysis of NCG contribution to RM shows that there are intermittent ups and down in the contribution of NCG of the NRB to RM. The share was 35.94 percent in 1980 and it increased to 86.41 percent in 1985. However it started to decrease continuously after 1985. In 2008, its contribution was only 13.85 percent. The average relative contribution was 71.84 percent in 1980/89, 51.61 percent in 1990/99 and 20.62 percent in 2000/08. The contribution remained 30.84 percent in the whole study period. The percentage share has been decreasing because the budget deficit is financed mostly by external borrowing. It indicates that

the contribution of NCG or RM and money supply is significant, but its role has been decreasing with respect to time.

4.1.4 Contribution of Credit to Government Enterprises (CGE) in RM

Government enterprises are categorized into financial and non-financial ones. It is the financial institutions which mostly enjoy credit from the NRB.

Table No. 4.5

Share of CGE in RM

(Rs in Million)

Year	RM	CGE	% share of CGE in RM
1980	2468.6	372.1	15.07
1985	5177.3	708.0	13.68
1990	13924.8	778.9	5.59
1995	32686.3	731.7	2.24
2000	61003.7	1626.6	2.67
2005	96539.2	1325.2	1.40
2008	144591.7	443.1	0.31

Source : Quarterly Economic Bulletin, NRB, 2009.

The analysis of CGE contribution to RM shows that the contribution has CGE decreased continuously. It was 15.07 percent in 1980 and it decrease to 0.31 percent in 2008. The analysis shows that the credit to the government enterprises has exterted moderate effect on changes in high powered money. The average relative contribution was 11.11 percent, 3.22 percent and 1.35 percent in 1980/89, 1990/99 and 2000/08 respectively. The average contribution remained 2.28 percent in

the whole study period. It indicates that the domestic resources contribute a little in economic development. It mainly have to do with limited amount of domestic savings in Nepal.

4.1.5 Contribution of Credit to Commercial Banks (CCB) in RM

Credit demand of commercial banks are financial in two ways direct loans and advances and lending against government securities.

Table No. 4.6

Share of CCB in RM

(Rs in Million)

Year	RM	CCB	% share of CGE in RM
1980	2468.6	264.4	10.71
1985	5177.3	388.0	7.49
1990	13924.8	50.5	0.36
1995	32686.3	15.5	0.047
2000	61003.7	45.1	0.073
2005	96539.2	1724.0	1.80
2008	144591.7	660.7	0.46

Source : Quarterly Economic Bulletin, NRB, 2009.

The analysis of CCB contribution to RM shows that there are intermittent ups and downs in contribution of CCB to RM. The contribution was 10.7 percent in 1980 and it started to decrease and reached to 0.46 percent in 2008. The average relative contribution was 5.37 percent, 0.19 percent and 0.83 percent in 1980/89, 1990/99 and 2000/08 respectively. The average contribution remained 0.89 percent in the whole study period. However the trend was fluctuating in nature. The

contribution of CCB was significant but in the recent years its contribution to RM is not that significant.

4.1.6 Credit to the Private Sector

NRB's claim on private sector arises out of internal bills purchase and loans and advances to private organizations and individuals.

Table No. 4.7

Contribution of CPS in RM

(Rs in Million)

Year	RM	CPS	% share of CPS in RM
1980	2468.6	48.9	1.98
1985	5177.3	159.3	3.08
1990	13924.8	160.4	1.15
1995	32686.3	633.9	1.94
2000	61003.7	2104.5	3.45
2005	96539.2	3746.9	3.92
2008	144591.7	3053.2	2.11

Source : Quarterly Economic Bulletin, NRB, 2009.

The average relative contribution was 2.49 percent, 2.55 percent and 3.91 percent in 1980/89, 1990/99 and 2000/08 respectively. The average contribution remained 3.49 percent in the whole study period.

The analysis of contribution of CPS to RM shows that such a credit has exterted very insignificant expansionary effect on reserve money. Hence the relative contribution of such credit changes in high powered money is negligible.

4.1.7 Contribution of Net Other Assets (NOA) in RM

The excess of other assets of the NRB over other liabilities is net other asset.

Table No. 4.8

Share of NOA in RM

(Rs in Million)

Year	RM	NOA	% share of NOA in RM
1980	2468.6	-61.0	-2.47
1985	5177.3	853.8	16.49
1990	13924.8	382.9	2.75
1995	32686.3	-3811.7	-11.66
2000	61003.7	-3752.3	-6.15
2005	96539.2	-6377.8	-6.68
2008	144591.7	-8815.2	-5.89

Source : Quarterly Economic Bulletin, NRB, 2009.

The analysis of NOA contribution to RM shows that there are intermittent ups and down in the contribution of NOA to RM during the study period. The average relative contribution was 4.86 percent, 8.72 percent and -6.66 percent in 1980/89, 1990/99 and 2000/08 respectively. The average contribution remained 2.25 percent in the whole study period. In most of the year NOA of NRB exerted contractionary effect on RM. The analysis shows that NOA of NRB has exerted moderate effect on RM.

4.1.8 Contribution of Capital and Reserves (C and R)

The capital and reserves is an important component of the reserve money. It is the non-monetary liabilities of monetary authority. It has exerted contractionary effect on the growth of RM.

Table No. 4.9

Share of Capital and Reserves in RM

(Rs in Million)

Year	RM	C and R	% share of C and R in RM
1980	2468.6	789.6	31.99
1985	5177.3	2431.9	46.97
1990	13924.8	5037.3	36.17
1995	32686.3	14214.8	43.49
2000	61003.7	24370.9	39.95
2005	96539.2	28004.1	29.31
2008	144591.7	35730.6	24.71

Source : Quarterly Economic Bulletin, NRB, 2009.

The analysis of capital and reserves contribution to RM shows that there are intermittent ups and down in it. The analysis shows that capital and reserve has been the dominant determinant of RM. The table shows that it has contributed 31.99 percent contractionary effect in RM in 1980. It has contributed 21.71 percent in 2008. The average relative contribution was 36.82 percent, 44.04 percent and 32.89 percent in 1980/89, 1990/99 and 2000/08 respectively. The average contribution remained 35.90 percent in the whole study period. The contribution of capital and reserve is high due to a higher level of capital expansion by

banks. The rapid increase of new banks and financial institutions has also helped to the high share of C and R in RM.

From the above study NFA is the dominant determinant of RM. The share of NFA in RM as discussed above reflect the movement in the overall balance of payments of the country. In the latter years of the study period, it has contributed more than 100 percent to RM. This is because of a high volume of inflow of remittance in the country. NCG of NRB is another important determinant of RM. Negative contribution of NOA in most of the year and dominant share of capital and reserves in NDA offset the positive effect of NCG, CGE, CCB and CPS and the contribution of NDA is low and negative in the latter years. Despite a high value of NCG a high value of capital and reserve makes NDA relatively low or even negative.

4.2 Contribution of Money Multiplier

The value of money multiplier comes out by the interaction of the three sectors i.e. public, commercial banks and the central bank. In other words, the value of money multiplier is determined by the decision of public to hold their assets in the form of currency, the commercial bank's decision to hold excess reserve and the central bank's decision to set up required reserve ratio.

The bellow table shows that there are intermittent ups and down in the contribution of narrow money multiplier (m_1) to determine money supply in Nepal. But the contribution of broad money multiplier has increasing trend. The table shows that the contribution of narrow money multiplier (m_1) is not that significant to determine the stock of money. However, the contribution of broad money multiplier is significant.

Table No. 4.10

Contribution of Money Multiplier and its Determinants in Money Supply

(Rs in Million)

Year	m_1	m_2	c	r	t
1980	1.27	2.39	1.75	0.40	2.38
1985	1.13	2.17	2.14	0.65	3.91
1990	1.09	2.72	2.16	0.74	3.88
1995	1.05	2.57	2.14	0.86	4.58
2000	1.04	3.17	2.24	0.87	6.64
2005	1.07	3.20	2.06	0.80	6.37
2008	1.13	3.62	1.85	0.67	6.29

Source : Quarterly Economic Bulletin, NRB, 2009.

The value of narrow money multiplier was 1.27 in 1980 and it decreased and reached to 1.04 in 2000. It was 1.13 in 2008. In average it was 1.17 in 1980/89, 1.14 in 1990/99 and 1.06 in 2000/08. In average it was 1.12 in the whole study period. The analysis shows that there was a deceasing trend in narrow money multiplier. This may be due to increase in currency ratio. The value of money multiplier for broad money was 2.39 in 1985, 3.77 in 2000 and 3.62 in 2008. In average it was 2.40 in 1980/89, 2.87 in 1990/99 and 3.22 in 2000/08. In average it was 2.81 in the whole study period. The increasing trend in broad money multiplier is mainly due to increase in time deposit ratio. The decreasing trend in narrow money multiplier and increasing trend in broad money multiplier is mainly due to increase in saving and fixed deposit in comparison demand deposit. It looks like the demand deposit which does not provide return is less preferred to saving and time deposit by the people.

4.2.1 Currency to Demand Deposit Ratio (C/DD)

The relative amounts of cash and demand deposits, which the public chooses to hold has great significance in determining money supply. For example, if a significant proportion the community decides to pay by cheques rather than by cash, then the larger will be the total stock of money that will be supported by a given monetary base. This is precisely because of the fact that, one rupee in the hands of the public supports only itself, i.e. one rupee of money only; while one rupee with a commercial bank in its reserve can support several rupees of money in the form of derivative demand deposits.

Currency to demand deposit ratio (c) represent the community's choice between cash and demand deposits. There are noticeable ups and downs in the study period. In the study period, 1.75 was the lowest in 1980, and 2.24 has the highest in 2000. The average value of currency to demand deposit ratio was 2.02 in 1980/89, 2.25 in 1990/99 and 2.14 in 2000/08. The average for the whole study period was 2.13. As the financial system develops the currency to demand deposit ratio is expected to decline. However this is clear from the above table that this did not happen in Nepal. One of the reasons for a high and discreet jump in currency ratio may be due to the discreet monetisation process that is taking place in Nepal. The determinants of currency ratio are income, interest rate on interest bearing assets; the availability of bank services; degree of public confidence in banking system etc. In the context of Nepal, the above results can be considered ambiguous. This is because as income increases currency holding and demand deposit increases. Theoretically demand deposit increases more than currency holding. But this may not be the case with Nepal where a large number of people live below the subsistence level. Any increase in income can be held in the

form of currency for the immediate spending on basic consumption goods and services. Even if a rise in income of the people living below a subsistence level leads to a shift from additional cash income to bank deposit rather than cash holdings, it is not the demand deposit but the savings deposits which increases. For low income people savings deposits are more popular as they provide both returns and liquidity to their holding. As Nepal has low level of financial assets, people usually hold their assets either in cash or in demand or time deposits (saving and fixed deposits). In the case of changes in interest rate on interest bearing assets it is likely to bring about a shift from demand deposits to time deposits. And if there are people holding a large cash, they, are likely to shift from cash to saving deposits. Thus currency ratio does not decrease in Nepal.

4.2.2 Reserve to Demand Deposit Ratio (R/DD)

Reserve to demand deposit ratio is another "proximate" determinant of money supply. A smaller reserve ratio enables grater expansion in the creation of credit by the banks and vice versa. Total reserve of commercial banks can be classified into statutory cash reserves which is legally mandatory for commercial banks to maintain i.e. required reserve and the other is the reserve maintained by commercial banks in excess of statutorily required reserves i.e. excess reserves. The reserve to demand deposit ratio was 0.40 in 1980 and increased to 0.87 in 2000. It was 0.67 in 2008. It was 1.01 in 1997. This shows that the total reserves of commercial banks surpassed the total demand deposits held at the banking sector in 1997. It has dampened the coefficient of money multiplier to 0.97 which is the lowest in the study period. The average value of reserve to demand deposit ratio was 0.58 in 1980/89, 0.88 in 1990/99 and 0.82 in 2000/08. It was 0.74 for the whole study period. This

shows that reserve to demand deposit ratio is one of the major determining factors of money multiplier.

Reserve ratio is one of the most frequently used monetary policy instrument, which was 9 percent of domestic deposit of commercial banks during the most part of 1980s, has increased to 12 percent during the most part of 1990s, has now been reduces to 5 percent. But the average value of reserve ratio was 0.74 for the whole study period. This shows a high excess reserve position in the commercial banks of Nepal.

4.2.3 Time to Demand Deposit Ratio

Time deposit to demand deposit ratio (t) is one of the components of broad money multiplier (m_2). Time to demand deposit ratio has the positive relationship with m_2. There has been a gradual increase in time deposit ratio in the study period. The ratio was 2.38 in 1980 which went up to 6.29 in 2008. The average value of time deposit ratio was 3.39 in 1980/89, 4.96 in 1990/99 and 6.35 in 2000/08. It was 4.85 for the whole study period. The surge in time deposit ratio pushed broad money multiplier from 2.38 in 1980 to 6.29 in 2008. The factors affecting the time deposit ratio are income, the interest rate on time deposits and the market rate of interest. Time deposits are hypothesised to be more sensitive to changes in income then demand deposits. The expansion of bank branches in rural Nepal is believed to have helped boost the mobilization of bank deposits which has helped to increase savings and fixed deposits. The empirical evidence as suggested by time deposit ratio leads support these argument.

4.2.4 Movement of m, c, r and t Ratios

Table No. 4.11

Movement of m, c, r and t Ratios

Variables		1980-08	1980-89	1990-99	2000-08
m_1	S.D.	0.18	0.06	0.29	0.04
	C.V.	15.77	5.39	24.42	4.21
m_2	S.D.	0.39	0.15	0.21	0.22
	C.V.	14.45	6.42	7.92	6.74
c	S.D.	0.21	0.22	0.20	0.21
	C.V.	9.32	10.86	9.64	9.77
r	S.D.	0.17	0.11	0.24	0.11
	C.V.	22.41	18.76	3.71	13.09
t	S.D.	1.34	0.57	0.76	0.27
	C.V.	27.63	15.93	15.26	4.32

Source : Quarterly Economic Bulletin, NRB, 2009.

S.D.　= Standard Deviation

C.V.　= Coefficient of Variance

The stability of money multiplier is important for conducting monetary policy. The stability of money multiplier and its determinants are measured by standard deviation and the relative variability is measured by the coefficient of variation. On the whole the standard deviation of m_1 is less than the standard deviation of m_2 so the narrow money multiplier is more stable than the broad money multiplier. However, the coefficient of variation of m_1 is greater than the coefficient of variation of m_2.

Among the determinant of money multiplier the standard deviation of time deposit ratio is greater than the currency ratio and the reserve ratio. The currency ratio shows the smaller coefficient of variation and hence the greatest relative stability. The coefficient of variation of the other determinants show considerably greater relative variability in the short run as well as in the long run. The coefficient of variation of time deposit ratio on the long run is greater than the reserve ratio. This reveals the importance of the time deposit ratio in controlling money supply in the long run. But in the short run reserve ratio is important to control money supply.

4.3 Empirical Evidence

4.3.1 Estimation of Narrow Money

This analysis shows the relationship between narrow money stock with reserve money and narrow money multiplier. The relationships are estimated by using the log linear regression equations, which is as follows:

$$\ln M_1 = \alpha + \beta_1 \ln B + \beta_2 \ln m_2 + u$$

The result of this regression model is

$$\ln M_1 = 0.276 + 0.98 \ln B - 0.013 \ln m_2$$

$$(4.141) \ (152.662) \quad (-0.208)$$

$R^2 = 0.99$ $\bar{R}^2 = 0.99$

F-test $= 12567.27$ D-W test $= 2.226$

Interpretation of the Result

The value of R^2 and adjusted R^2 are near to unity, so there is a good and strong relationship between dependent and independent variables. The high coefficient of F-test shows that the regression line is highly significant. The value of reserve money as an independent variable is significant at 1 percent confidence level (t-test). But the coefficient of money multiplier as an independent variable is insignificant at 5 percent confidence level (t-test). Since the calculated value of D-W test is greater than the tabulated value, there is no auto-correlation. The test statistics suggest that the estimated equation is efficient it is because it is BLUE. The coefficient of reserve money shows that one rupee change in reserve money leads to 0.98 rupee change in narrow money stock, M_1. The coefficient of narrow money multiplier (-0.013) is statistically insignificant. This suggest that narrow money multiplier has no significant role to determine money supply in Nepal.

The value of narrow money multiplier depends upon the value of currency ratio and reserve ratio. The coefficient of narrow money multiplier is insignificant because the value of currency ratio and reserve ratio is high.

4.3.2 Estimation of Broad Money

This analysis shows the relationship between broad money stock with reserve money and broad money multiplier. The relationship is estimated by using log linear regression equation, which is as follows:

$$\ln M_2 = \alpha + \beta_1 \ln B + \beta_2 \ln m_2 + u$$

The result of this regression model is

$$\ln M_2 = 0.067 + 1.035 \ln B + 0.672 \ln m_2$$

$$(-1.246) \quad (102.016) \quad (7.347)$$

$R^2 = 0.99$ $\bar{R}^2 = 0.99$

F-test $= 21535.7$ D-W test $= 1.763$

Interpretation of the Result

The value of R^2 and adjusted R^2 are near to unity, there is a good and strong relationship between dependent and independent variables. The high value of F-test shows that the regression line is highly significant. The independent variables, reserve money and broad money multiplier are significant at 1 percent confidence levels (t-test). Since the calculated value of D-W test is greater than tabulated value, there is no auto-correlation. All the test statistics suggests the estimated equation is efficient. The coefficient of reserve money and the broad money multiplier have the correct signs. The coefficient of reserve money shows that one rupee change in reserve money leads to 1.035 rupee change in broad money stock, M_2. The coefficient of broad money multiplier shows that one unit change in money multiplier leads to 0.67 rupee change in broad money stock M_2.

The value of broad money multiplier depends upon the value of currency ratio, reserve ratio and time deposit ratio. Despite the high value of currency ratio and reserve ratio which have negative effect on money multiplier, the time deposit ratio makes positive contribution and the coefficient of broad money multiplier is significant.

CHAPTER V
SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter contains the summary, conclusion and recommendations of this study. The summary, conclusion and recommendations of this study are presented in the first, second and third section of this chapter respectively.

5.1 Summary

Money supply is defined differently by different economist, in case of Nepal money supply is defined narrowly as well as broadly (currency plus demand deposits and narrow money plus time deposit). There are two proximate determinants of money supply i.e. reserve money and money multiplier. Monetary base is determined by two components i.e. net foreign assets and net domestic credit. And money multiplier is determined by three components i.e. currency to demand deposit ratio, reserve to demand deposit ratio and time deposit to demand deposit ratio.

In Nepal money supply has been used as an intermediate target to attain macro economic objectives of the monetary policy. But planed growth rate of money supply had been never realized. To attain the macro economic objectives of the monetary policy money supply should change as planned. To change money supply as planned the contributions of the factors that determine money supply have to be properly understood.

The research is especially design to estimate the role of different factors that determine money supply in Nepal. This study covers from 1980 to 2008. The present study is based on secondary data. The information that are essential for this study to fulfil the stated objectives

are collected from different sources. The data were processed by using various statistical tools. Linear regression equation and various statistical tools are used in the study.

Money multiplier approach of money supply is used in the study. Money multiplier approach of money supply states that money stock is simply a multiple of the monetary base.

One determinant of money supply reserve money is the dominant determinant of narrow as well as broad money stock. In recent years the reserve money stock appeared larger than narrow money stock. Among the various sources of money supply net foreign asset is the major source of the reserve money. The contribution of NFA in RM is 103.09 percent in the whole study period. Net claims on government is another major source of reserve money. Its contribution to RM is found decreasing in the latter years of the study period. The contribution of other component of RM (i.e. CGE, CCB and CPS) have moderate effect on RM. NOA as a component of RM exert contractionary effect in RM, in most of the years. The contribution of capital and reserve is dominant in RM. The contribution remain 35.90 percent in the whole study period.

The value of money multiplier comes out by the interaction of the three sectors i.e. public, commercial bank and the central bank. The contribution of narrow money multiplier (m_1) is not significant but the contribution of broad money multiplier (m_2) is significant to determine the money stock. The currency ratio one of the determinants of money multiplier shows stabilizing nature than time deposit ratio in the study period. But the reserve ratio has more stabilizing nature than currency and time deposit ratio. But the coefficient of variation shows that currency

ratio has grater relative stability than the reserve ratio and time deposit ratio.

5.2   Conclusion

Reserve money has been the dominant determinant of money supply for both M_1 and M_2. The less than one value of narrow money multiplier establish the fact that reserve money has been the more or less sole determinant of M_1.

The value of reserve money is statistically significant to determine narrow money as well as broad money stock. But the value of money multiplier is statistically insignificant is case of narrow money but it is significant in case of broad money. Since reserve money is largely policy determined variable, the monetary authority can regulate the total volume of money stock by means of its proper management. In recent times the increasing trend of net foreign assets which is not in the control of central bank, may arise some difficulties to control reserve money in appropriate direction. In the half of the study period, net credit to the government has played a crucial role to determine reserve money but in the latter half its share to reserve money has decreased. But the monetary authority can not control NFA and NCG because NFA depend on BOP situation and NCG depends on government budgetary position. In this regard controlling of money supply through money multiplier is essential.

The component of money multiplier are currency ratio, reserve ratio and time deposit ratio. The currency ratio shows the smallest coefficient of variation and hence the greater relative stability. The coefficient of variation of other determinants show considerably greater relative variability.

5.3 Recommendation

Based upon the findings of this study the following tentative recommendations are made. The recommendations are tentative, it is because as the economic situations change the monetary policy have to be changed accordingly.

In all the fiscal year actual money supply is less than or greater than the targeted level of monetary policy of NRB. So to attain the money supply as targeted, determinant of money should be change in desired level.

Reserve money is dominant component to determine the total volume of money stock in Nepal. So its proper management is necessary to regulate the level of money supply in appropriate direction. As NFA and NCG are beyond the control of the monetary authority, to influence reserve money other components of RM should be influenced.

The high variability of the contribution of the reserve ratio in money multiplier shows the importance of reserve ratio in controlling money supply. The currency ratio and the time deposit ratio are not subject to the direct control of the monetary authority. The currency and time deposit ratios are influenced by the actions of innumerable holders of money so monetary authority should focus its attention towards reserve ratio.

In order to use various policy tools effectively to control money supply, efforts should be directed towards developing and broadening the existing money market in the economy.

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