THE STUDY OF MONETARY APPROACH TO BALANCE OF PAYMENTS IN NEPAL (1964/65-2009/10)

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Letter of Recommendation

This thesis entitled "THE STUDY OF MONETARY APPROACH TO BALANCE OF PAYMENTS IN NEPAL (1964/65-2009/10)" has been prepared by Ram Kumar Shrestha under my supervision. I hereby recommended this thesis for examination by the Thesis Committee as a partial fulfillment of the requirements for the Degree of MASTER OF ARTS in ECONOMICS.

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Approval Sheet

We certify that this thesis entitled "THE STUDY OF MONETARY APPROACH TO BALANCE OF PAYMENTS IN NEPAL (1964/65-2009/10)" submitted by Mr. Ram Kumar Shrestha to the Central Department of Economics, Faculty of Humanities and Social Science, Tribhuvan University, in partial fulfillment of the requirements for the Degree of MASTER OF ARTS in ECONOMICS has been found satisfactory in scope and quality. Therefore, we accept this thesis as a part of the said degree.

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Ram Kumar Shrestha
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Table of Contents

List of Tables

List of Figures

Acronyms

BIMSTEC	Bay of Bengal's Initiative for Multi-Sectoral Technical and Economic Cooperation
BOP	Balance of Payments
C	Net Domestic Assets/ Net Domestic Credit
CBS	Central Bureau of Statistics
F	Net foreign Assets
FY	Fiscal Year
GDP	Foreign Direct Investment
GNI	Gross National Income
GON	Government of Nepal
HDI	Human Development Index
I	Interest Rate
IMF	International Monetary Fund
IRs	Indian Rupees
M_1	Narrow Money Supply
M_2	Broad Money Supply
MABP	Monetary Approach to Balance of Payments
M^d	Money demand
M^s	Money Supply
MOF	Ministry of Finance
NPC	National Planning Commission
NFA	Net Foreign Assets
NRB	Nepal Rastra Bank
NRs	Nepalese Rupees
P	Price Level
SAARC	South Asian Association for the Regional Co-operation
SAFTA	South Asia Free Trade Area
VIF	Variance Inflating Factor
WB	World Bank
WDR	World Development Report
WTO	World Trade Organization

CHAPTER - ONE

Introduction

1.1 General Background

The term balance of payment is much discussed but least understood concept. Because of its broader concept and complicated networking between various socio-economic elements people often get confused and puzzled. It is because of the fact that "... the term balance of payments is an ambiguous one. It is often used loosely without any precise definition of what it is intended to cover and such loose usage of the term in the case of much muddled thinking of the subject" (Meade, 1972).

The term balance of payment is defined as statistical tabulation of economic transactions between residents of one country and the residents of the rest of the world, another country or group of countries (Wasserman and Charles Hultman, 1970). So the balance of payment provides the basic data in a locally organized form for the quantitative analysis of international trading relationships as well as for the formulation of judgments concerning the significance and result of the foreign trade. As a total of economic analysis, it indicates how the goods, services and capital received from abroad, are paid for and how foreign nations pay for the things they received (Wasserman and Charles Hultman, 1970).

The balance of payments accounts of a country are constructed on the principle of double entry book keeping. Each transaction is entered on the credit and debit side of the balance sheet. Thus a balance of payment account must always balance, if full and accurate figures are entered in the account and if the accounts are not in balance, an error has been made (Wasserman and Charles Hultman, 1970).

The balance of payments measures the payments that follow between any individual country and all other countries. It is used to summarize all international economic transactions for that country during a specific time period, usually a year. The balance of payments is determined by the country's exports and imports of goods, services, and

financial capital, as well as financial transfers. It reflects all payments and liabilities to foreigners (debits) and all payments and obligations received from foreigners (credits) (karki, 2007).

Now turning to the structure of the balance of payment account which is made up three components:

(i) The balance of payments on the Current Account: This is the net difference between the value of the exported goods, services and imported goods and services. In this account, grants, worker's remittances, pension and other are also recorded.

(ii) The balance of payments on the Capital Account: This is the net difference between the lending abroad and the borrowing from abroad by the residents.

(iii) Balance of payments on the Monetary Authority's Account: This is the net difference between monetary authority's payments to abroad and the receipts from abroad. So, the balance of payments for a country is sum of the current account, capital account, and the monetary authority's account.

The 1930 world depression collapsed the entire superstructure of the classicists along with its two pillars – Say's law of market and Quantity theory of money. These economic disorders collapsed the international regime of fixed exchange rate and full employment and wage price flexibility become a dogma. These changed situations gave rise to the importance of new way of analyzing economic situation as well as balance of payments. The new way of analyzing the economic mechanism was led forward by the revolutionary work of Keynes "The General Theory of Employment, interest and Money" based on the assumption of mass employment and wage-price flexibility (Johnson, 1977).

The new theory analyzed the economic phenomenon in quite different way and the balance of payments. Contrary to the classical doctrine, the balance of payments was, now, a policy problem instead of automatically adjusting one. With its assumption of mass unemployment and wage price flexibility, the balance of payments could be corrected with the help of policy variables (Johnson, 1977).

The theory which was developed along the Keynesian ideas is known as Elasticity Approach. This approach is based on the Marshallian tradition of treating the exchange

rate as a relative price that clears a market with well defined flow of demand and supply curves. The theory is based simply on the elasticity condition of demand and supply for goods and services and applicable if and only if Marshall Learner Condition is fulfilled and for complex models assuming independent elasticities of demand for import and supplies of exports, which is complex algebraic expression and challenging to derive and explore (Johnson, 1977).

The so called Elasticity Approach to devaluation proved unsatisfactory in the post war period of full and over full employment. This changed situation of full employment and inflationary pressure required a new way of correcting the balance of payments. To study this new problem a new theory came into existence especially organized by S.S. Alexander known as "Absorption Approach" which argued essentially that a favorable effect from devaluation along, in a fully employed economy, depends not on the elasticities but on the inflation resulting from the devaluation in these conditions producing a reduction in aggregate absorption relative to aggregate productive capacity (Johnson, 1977). The absorption approach relates a country's international surplus (or deficit) on current account to its excess (or shortfall) of national production in relation to national absorption, the latter being output absorbed in consumption, investment, and government activity. Equivalently, it relates the country's current account surplus (or deficit) to the excess (or shortfall) of national saving in relation to national investment, a government surplus or deficit counting as part of (or as a deduction from) national saving.

Both of the approaches Elasticity Approach and Absorption Approach are generally known as the traditional approaches of the balance of payments (Salvatore, 1998). These approaches have a common defect is that it deals with the balance of payments problem through the current account of merchandise trade only. The study of balance of payments through current account is incomplete in nature. The policy suggested by the traditional approach may not be able to achieve the goal of balance of payments equilibrium. As a matter of fact that the goods and services exported and imported in less developed countries are inelastic in nature. With an inelastic supply and demand, the price variation cannot change the supply and demand for goods and services, that is to say these

approaches cannot meet the goal with its policy variable. The Nepalese economy suffers from the same problem (Rhomberg and Heller, 1977).

As the Elasticity and Absorption approaches fail to provide the correcting measures of balance of payment deficit in the less developing countries; another approach is still available which is known as the Monetary Approach to the Balance of Payments. According to the monetary approach, the balance of payments is purely a monetary phenomenon. Being a monetary phenomenon, it can be corrected only through the monetary measures. According to the monetary approach, the balance of payments is a monetary phenomenon is related to inflow and outflow of international reserves. If money supply is defined as the sum of reserve and net credit creation, the monetary authority can hold a control over only a single component of it. That is only net credit creation. So, the monetary authority can influence the money supply just by controlling a component of the money supply and through it the international reserve. So, viewed from the supply side of money, the balance of payment problem is a monetary problem and monetary policy is applicable to control it. The monetary approach relates a country's overall international surplus or deficit to change in the aggregate balance sheet of its monetary institutions.

On the demand side of money, the monetary approach assumes that, in an open economy, price, income and interest rates are exogenously determined. Being exogenously determining factors, the monetary authority cannot influence the demand side of the money. So, the demand side of money has to be controlled through the supply side of it. So, when the nominal or actual demand for money increases, there will be a tendency for reserve inflows and when demand for money decreases it tends to outflow of the international reserve. This shows that money supply and money demand have a relationship with international reserve or balance of payments.

The applicability of all the three approaches demands must labor and intelligent. But none of the approach can be said to be better or worse than the other though, these approaches have their own characteristics. In this regard, Heller and Rhomberg (1977) states that each of the three approaches could in principle produce the right answer if they

were correctly applied, that is to say, if proper allowance were made for all the repercussions throughout the economy of change whose effect is being analyzed. So the use of the particular approach of the balance of payments depends upon the economic status of a country and availability of the data (Karki, 2007).

1.2 Nepalese Context

Nepal is located between two giants of the Asia, People's Republic of China of size 9596960 sq km area, population 1338 million and size of GNI US$ 5700.0 billion and Republic of India of size 3287590 sq km area, population 1171 million and size of GNI US$ 1566.6 billion (WRD, 2011). Nepal is a landlocked least developed country with size 147181 sq km area, population 29.0 million and size of GNI US $ 13.0 billion surrounded by Tibet autonomous region of People's Republic of China to the north and by Republic of India to the east, west and south. Nepal's Human Development Index (HDI) is at the lower ebb as mentioned in the Human Development Report 2011. Of the 187 countries included in the Report, Nepal is at 157th position, the lowest among SAARC Countries (HDR, 2011). The country is suffering from trade deficit with India and overseas (177120.6 million with India and 136390.6 with overseas in FY 2009/10) which adversely affects the balance of payment situation and International reserves (Economic Survey, 2010/11).

The land locked position, rugged topography with limited crop land, poor resource base and a high extent of poverty are major hurdles facing the Nepalese economy. The biggest constraint to Nepal's economic development has remained her land locked position forcing the country to be a high cost economy because of the limited access to sea (Dahal, 1990). The nearest sea access for Nepal is Calcutta port which is more than 1000 km far from boarder.

Large hydropower resource (world's 2.3 percent), rich biodiversity together with geographic diversity and varied climate condition, cheap and adequate labor force and attractive tourism sector are the major economic foundation for the economic development of Nepal (Sunar, 2003). However, due to the scarcity of capital and lack of

appropriate technology and innovation, available resources are not utilized appropriately. To enhance development activities, the country has to depend upon foreign aid.

In Nepal foreign trade is not become an engine of economic growth. Due to large import base and relatively poor export base the country is always in trade deficit. This has made country's international position fragile. Although inflows of foreign assistance and labor remittance inflow have contributed to a favorable position in country's balance of payments account. In recent years remittance inflow has significantly contributed to reduce the pressure of trade deficit on current account. It is emerging as a main contributing factor of Nepal's balance of payment (Sunar, 2003).

In developing country like Nepal, the increasing demand for assets for its development plan is one of the main problems. To solve this problem it is necessary to study the balance of payment with various aspects of a country's international economic position. The country will be in an extremely vulnerable situation when a country faces serious BOP problem, especially deficit. When a country faces a serious balance of payments problem, especially deficit, it places the country in an extremely vulnerable situation.

Nepal, a low growth economy with lower per capita income (US $ 440) in the region (per capita GNI for India, Pakistan, Bhutan and Sri Lanka are US $ 1180, 1020, 1875 and 1990 respectively in 2009) needs to make best use of available opportunities through learning lesson from the amazing performance of her neighboring economies. It, therefore, urgently needs pre conditions like price stability and other macroeconomic stability along with the foreign sector stability for sustainable economic development (WDR, 2011).

The monetary policy which keeps the macro economic variables within the desired limit, is not working efficiently and largely influenced by the neighboring economics. This is due to the ideal geographical location of landlocked by India in its three sides on the east, west and south and China on the north. Due to highland and snowy mountains, transportation has become difficult in the north and the country has to depend on the southern route for its commercial centers are linked with Indian towns near the border.

Besides, the Nepalese boarder to India is open to the citizens of either country without passport requirements. As a result, the Indian and Nepalese markets are quite open for trade both legally and illegally. Nepalese rupee is linked at par to Indian rupee with only seven adjustments in the exchange rate since 1960, the last which occurred in Feb 12, 1993. Trade with India alone is more than 60 percent and at the same time Nepalese currency (NRs) is linked at par to the Indian Currency (IRs). Therefore, monetary policy of Nepal is largely influenced by the factors of southern neighbor India (Khand, 2010).

Nepal's exchange rate policy has moved from having no defined exchange rate policy before establishment of the Nepal Rastra Bank in 1956 to development of definitive exchange rate policy after 1960. There had been three distinct sub periods for exchange rate history (a) floating exchange rate period (before 1956); (b) transition to pegged exchange rate period (1956-1960); and (c) pegged exchange rate period (1960 onwards). Floating exchange rate period (before 1956); prior to the establishment of NRB, mainly IRs along with the NRs circulated in Nepal, as a medium of exchange (Khand, 2010). The value between each currency was market determined. The fluctuations in supply and demand of currencies were reflected in the floating rates. That was the floating exchange rate regime. However, as the currency was metallic, it was not varying drastically.

Transition to pegged exchange rate period (1956-1960): The situation from 1956 to till 1960 was extremely volatile in respect of NRs-IRs exchange market. Changes in NRs-IRs exchange rate occurred very frequently. That had an adverse effect on the confidence of Nepalese currency market and trade and commerce on the economy of Nepal. Under this circumstance, Nepal had to take steps with policy shift from a flexible exchange rate to a pegged exchange rate with India. This policy returned the confidence of NRs and stabilized the NRs-IRs exchange rate.

Pegged exchange rate period (1960 onwards): for the period after 1960, the experience of exchange rate relation with IRs can be described as the experience of a pegged exchange rate. However, the period also reflects changing attitudes of Nepalese authority for exchange rate policy towards foreign currencies other than IRs. During the whole span

covering after 1960, there were three re-valuations (1965, 1991 and 1992) and four devaluations (1967, 1971, 1976 and 1985) in NRs-IRs exchange rate.

There have been no adjustments in the NRs-IRs exchange rate since 1992 and at present 160 NRs can be converted to 100 IRs and vice versa. This stability of the NRs-IRs exchange rate parity and the absence of significant broken cross rates suggest the coordination of Nepalese and Indian currency rate policy has indeed occurred (Maskay, 2004).

High trade dependency and high trade deficit with India (56.50% of total trade and 177120.6 Rs Million of trade with India in FY 2009/10), high labor mobility between Nepal and India, possibility of broken cross rate and currency arbitrage opportunity existence, difficulties to be faced by large people near the terai and southern border due to regular adjustment of NRs-IRs exchange rate, cultural, religion and geographic tie-up, not sufficient development of economic fundamentals etc. are the constraints for floating exchange rate policy for Nepalese monetary authority.

Further, Nepalese economy is gradually integrating with the global economy. In particular, trade and industrial liberalization, current account convertibility and gradual move towards capital account convertibility are important policy measures adopted in this regard. Nepal's participation in regional arrangements like South Asian Free Trade Area (SAFTA) and Bay of Bengal's Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) along with its accession into the World Trade Organization (WTO) has further integrated Nepal with the rest of the world. It has posed Nepal both opportunities and challenges to promote competitiveness (Khand, 2010).

1.3 Statement of the Problem

Foreign assets reserve plays significant and vital role in the aggregate economic activities of Nepal. A country should have substantial amount of foreign assets reserve to fulfill the demand for it. The demand for foreign currencies arises because Nepal is not self sufficient. They are bound to import various goods and services, either because they do not produce all the goods and services in their own countries or their production is less

than their needs. They also have to repay the debt and its interest to the countries that they have borrowed from. Besides, the foreigners repatriate the money they have brought from their countries and the income they have earned in the country.

Foreign assets reserve affects money supply and money supply affects on macroeconomic variables like price level, interest rate, exchange rate, exports, imports, production and employment which ultimately affects the balance of payments of a country. In this way, foreign assets reserve has indirect but significant impact on the aggregate economic activities of a country. Stability in the economy is a precondition to maintain sustainable growth of any economy (Khand, 2010). Fluctuation in NFA is one of the main components to destabilize the economy. NFA of a country should not fluctuate so high for stability in the economy. If a country faces persistent deficit in the balance of payments account, the NFA of the country decreases substantially. The development activity of the country will suffer from this. The exchange rate of the domestic currency is bound to go down. In a fixed exchange rate regime, central bank will be devaluating its currency, whereas in a floating exchange rate regime, market mechanism will reduce the purchasing power of the currency. However frequent devaluation of currency is not conductive to sustain a stable growth in the economy. Not only this, in a developing country like Nepal, where exports and imports of goods and services are price inelastic, devaluation of currency is not proper remedy of the problem. Again if a country persistently realizes surplus in its BOP, it would causes in increase in the international reserve, which would lead to an increase in its money supply in the country and ultimately results a high rate of inflation in the country. A persistent deficit as well as surplus in the BOP is not conductive to the stable growth and development of the economy. Thus, NFA should be stable and positive to have a sustainable growth and development of the economy. To achieve these goals and to make the NFA policy responsive, the significant factors that cause fluctuation in the NFA have to be identified. After identifying the significant factors and the root causes of this problem, the government can adopt countervailing measures of fiscal and monetary policies to achieve the above mentioned goals (Khand, 2010).

The data of NFA of the monetary authority of Nepal shows a wide fluctuation. In some of the years, the growth rate of NFA of Nepal is very high, in some of year, it is very low, and in some year, it is negative also. The figure 1 in the appendix-C gives the growth rate of NFA for fiscal year 2064/65 to 2009/10 of monetary authority of Nepal. From figure, we can conclude that the growth rate of NFA of monetary authority of Nepal is highly unstable. This evidences that Nepal is suffering from BOP problem. The change in NFA of Nepal is unstable and is not always in the positive direction. To solve this problem, we have to find out the root cause of this problem and factors involved in it.

1.4 Objectives of the Study

This study attempts to investigate the responsible factors that cause the fluctuation in the NFA and the BOP in Nepal. The following are the specific objectives of the study:

(i) To investigate magnitude and direction of the impact of income, price, interest and domestic credit on change in the NFA and BOP of Nepal, and

(ii) To investigate whether monetary policy is an appropriate tool to manage net foreign asset flow in Nepal.

1.5 Hypothesis of the Study

This study is supposed to test the hypothesis that the change in NFA of Nepal has significant relationship with the change in income, price, interest and net domestic assets. All hypotheses are designed to achieve the objectives of the study. Following hypotheses are tested in this study:

a. Income: A positive growth rate of the real income of a country is considered to increase the inflow of foreign assets in the country. It is considered because the country which has a positive growth rate of income has also positive growth rate in its production sector. In a country where the production of the goods is increasing is expected to attract the foreign investors and then export too. Due to this reason, the country is expected to increase the inflow of foreign assets in the country. Thus, the hypotheses are: null hypothesis (H_0): Change in the real income does not have any influence on the change in NFA in the country, and, alternative hypothesis (H_1): Change in the real income influences on the change in NFA of a country.

b. Price Level: Increase in domestic price level leads to an increase in the demand for nominal money balances. If the increased demand for nominal money is not met from the domestic sources, it leads to an outflow of goods, services and financial assets and causes inflow of foreign assets in the country. The hypotheses are- null hypothesis (H_0): Change in domestic price level does not influence on the change in NFA in the country, and, alternative hypothesis (H_1): Change in domestic price level influences on the change in NFA in the country.
c. Interest Rate: Interest rate is the opportunity cost of holding money. If interest rate increases, people's liquidity preferences of money decrease and vice- versa. An increase in interest rate decreases demand for money causes excess supply of money which leads to an increase in imports of foreign goods and services causing outflow of foreign assets. The hypotheses are - null hypothesis (H_0): Change in interest rate does not change NFA in the country, and, alternative hypothesis (H_1): Change in interest rate changes NFA in the country.
d. Domestic Credit: An increase in domestic credit increases the supply of money. It leads to an increase in demand for goods and services. If domestic sources or supply of these things is constant or inelastic, it is met from foreign sources, causing outflow of foreign assets, i.e. deficit in balance of payments. The hypotheses are – null hypothesis (H_0): Change in net domestic credit does not change net foreign assets reserve in the country, and, alternative hypothesis (H_1): Change in the net domestic credit changes the net foreign assets reserve in the country.

Thus, this study is supposed to test the hypothesis that changes in NFA have a significant relationship with GDP, price, interest and net credit creation. Specifically, the statistical hypotheses are:

1. $H_0 : b_1=0; H_1 : b_1>0$
2. $H_0 : b_2=0; H_1 : b_2>0$
3. $H_0 : b_3=0; H_1 : b_3<0$
4. $H_0 : b_4=0; H_1 : b_4<0$

Where b_1 is the coefficient on GDP, b_2 is the coefficient on price level, b_3 is the coefficient on interest and b_4 is the coefficient on net credit creation. Income and price level are hypothetically expected positive relationship with NFA, whereas, interest and domestic credit are hypothetically expected negative relationship with the NFA. These hypotheses are tested by using t-statistic at 1 percent and 5 percent level of significance.

1.6 Limitations of the Study

The important syndrome of Nepal is its monetary dualism. It implies the coexistence of non-monetized rural economy and monetized economy. However, Nepalese economy is continuously transforming from non-monetized economy to monetized economy that will consequently affect the BOP but this model may not sufficiently cover these factors. This type of dualism bears problems for estimation of macroeconomic variables too.

There are numerous factors which affect the BOP, and these all are not included in this study. This study only includes the macroeconomic variables GDP, price, interest and net domestic credit as influencing factors for NFA and BOP changes.

This study covers only the period from fiscal year 1964/65 to 2009/10. The consumer price index (CPI) is taken as a proxy for price level. Similarly, gross domestic product (GDP) is taken as the proxy for real income. This study only considers the fixed deposit rate of commercial bank for one year period for interest rate. Besides, unavailability of the data, unreliability of the data and shortage of essential materials for study which all the researchers feel is not exceptional for this study also.

1.7 Plan of the Study

This study has been divided into five chapters. First chapter includes the introduction of the study along with the specification of the problem and objectives of the study. The second part of the study covers the review of the literature which provides this study a solid foundation to carry out the research. The third chapter includes the methodology of the study. Fourth chapter is devoted to analyze the result of the study. Summary and conclusion of this study and recommendation to solve the BOP problem of Nepal are presented in the fifth or the final chapter.

CHAPTER - TWO

REVIEW OF LITERATURE

This chapter is devoted to the review of the literature written on the balance of payments and monetary approach to the balance of payments, which explains, supports and shows the significance of the study that I am doing now. The balance of trade and the balance of payment has been successfully applied in the various socio economic conditions and finally concluded that the monetary approach to the balance of payment is an efficient, appropriate and effective tool in the study of the balance of payments in a small, open and underdeveloped countries like Nepal where the data recording system are inefficient and insufficient.

2.1 Conceptual Framework

2.1.1 The Meaning of Balance of Payments

A country's balance of payments (BOP) is defined as the record of all economic transactions that take place during a specified time period between the country's residents and the rest of the world (Heller: 1976). The balance of payments (BOP) measures the payments that flow between any individual country and all other countries. It is used to summarize all international economic transactions for that country during a specific time period, usually a year. The BOP is determined by the country's exports and imports of goods, services, and financial capital, as well as financial transfers. It reflects all payments and liabilities to foreigners (debits) and all payments and obligations received from foreigners (credits). Balance of payments is one of the major indicators of a country's status in international trade, with net capital outflow.

The term balance of payments is an ambiguous one. It is often used loosely without any precise definition of what intended to cover and such loose usage of the term is the cause of much muddled thinking of the subject (Meade, 1972). It is because of the cause that it is not possible to proceed without a full discussion of the various possible meaning of this term.

The balance of payments is a statistical statement that summarizes transactions between residents and nonresidents during a period. The balance of payments comprises the current account, the capital account, and the financial account. Together, these accounts balance in the sense the sum of the entries is conceptually zero (IMF, 1993).

The Current Account: This consists of exports and imports of merchandize goods and services. Current account balance may be positive or negative. If there is positive current account balance we generally call it as surplus in current account. If it is negative we call it as deficit in current account balance. In Nepalese context current account can be classified into three main sub headings namely trade in goods, trade in services and transfer set.

The Capital Account: This records all kinds of capital transaction of a country with the rest of the world. It consists of short term and long term capital transaction. The capital account balance can be defined as the excess of receipts (borrowing) over payment (lending) by the residents of the country. It also may be positive or negative.

In Nepalese context, capital account can be categorized into two main subheadings namely official capital, net and miscellaneous capital items, net. Under official capital, net foreign loan is credit entry and amortization is debit entry. Miscellaneous capital is composed of net foreign direct investment, portfolio investment and other investment. Unidentifiable capital items which cannot be recorded through banking system are included under this heading. Net Errors and omissions are also included under this heading.

The Monetary Authority's Account: The monetary account records all monetary transactions of monetary authority. It can be defined as an excess of receipts over payments to abroad made by the monetary authority during a specific time period. It is also called overall balance. Overall balance also may be positive or negative.

2.2 Disequilibrium in Balance of Payments

The balance of payment equilibrium is desired by each country but it is rarely attained. Disequilibrium in a country's balance of payments indicates imbalances between the autonomous international payments and receipts.

Generally,

If BOP>0 implies Surplus

If BOP<0 implies Deficit

The disequilibrium in the balance of payments results into either surplus or deficit.

2.3 Different Approaches to Study the Balance of Payments Problem

The different approaches to study the balance of payments problems can be explained as follows.

2.3.1. The Elasticity Approach:

The theoretical foundation of the elasticity approach is the Keynesian school of thought. Assuming the economy is unstable in nature this school of thought believes that BOP does not correct by itself and suggests that to correct the BOP, certain policy intervention by government is necessary.

Following the Marshallian partial equilibrium analysis, this approach studies the BOP problem through the current account. According to this approach disequilibrium in the current account is due to different situation in different countries. And to correct the BOP problem price should be directed in the right direction. This approach suggests that devaluation (or revaluation) of domestic currency will able to correct the BOP problem of the country. But the effect of devaluation (or revaluation) depends on four important elasticities: the elasticities of demand for imports and exports and the elasticities of supply of imports and exports. In developing countries like Nepal, the Elasticity Approach to correct the BOP problem is less applicable because of the lack of proper data of the four above elasticities (Sunar, 2003).

How Devaluation and revaluation Improves the Balance of Payments?

When there is deficit in Balance of Payments, devaluation will improve the balance of payments by increasing exports and decreasing imports. When there is surplus in the balance of payments, revaluation will correct the balance of payments by curtailing the exports and increasing imports.

The balance of payments equation in this approach is

$$B = X - M \quad \text{..... (1)}$$

Where, B = Current account Balance (i.e. Balance of Payments)

X = Exports

M = Imports

Generally,

If X > M $\Rightarrow$ B >0 $\Rightarrow$ BOP surplus

If X < M $\Rightarrow$ B <0 $\Rightarrow$ BOP Deficit

If X = M $\Rightarrow$ B = 0 $\Rightarrow$ BOP Equilibrium

Based on the equation (1), the analytical tool of this approach (Heller: 1976) is

$$\frac{dB}{dr} = -\left[X_0 \frac{\varepsilon_x (\eta_x + 1)}{\varepsilon_x + \eta_x} + M_0 \frac{\eta_m (\varepsilon_m - 1)}{\varepsilon_m + \eta_m} \right] \quad \text{..... (2)}$$

Where, dB = Change in Balance of Payments

dr = change in exchange rate (r)

X_0 = Initial Exports

M_0 = Initial Imports

ε_x = demand elasticity of exports

ε_m = demand elasticity of imports

η_x = supply elasticity of exports

η_m = supply elasticity of imports

Equation (2) shows the precise relationship between exchange rate changes, dr and the balance of payments. This equation clearly states that the effect of exchange rate changes on the balance of payments depends on four important elasticities: the elasticities of demands for exports and imports. The elasticities and the volume of exports and imports are significance (Heller, 1976).

Assuming that we start with initial situation where trade is balanced i.e. $X_0 = M_0$. Then analytical tool becomes:

$$\frac{dB}{dr} = -X_0 \left[\frac{\varepsilon_x (\eta_x + 1)}{\varepsilon_x + \eta_x} + \frac{\eta_m (\varepsilon_m - 1)}{\varepsilon_m + \eta_m} \right] \quad \text{..... (3)}$$

This equation (3) suggests that the change in exchange rate will improve the balance of payments if $\left[\frac{\varepsilon_x (\eta_x + 1)}{\varepsilon_x + \eta_x} + \frac{\eta_m (\varepsilon_m - 1)}{\varepsilon_m + \eta_m} \right] > 0$

This condition is generally referred to as the Marshall-Learner condition.

If $\left[\frac{\varepsilon_x (\eta_x + 1)}{\varepsilon_x + \eta_x} + \frac{\eta_m (\varepsilon_m - 1)}{\varepsilon_m + \eta_m} \right] > 0 \Rightarrow$ Devaluation will improve the BOP.

If $\left[\frac{\varepsilon_x (\eta_x + 1)}{\varepsilon_x + \eta_x} + \frac{\eta_m (\varepsilon_m - 1)}{\varepsilon_m + \eta_m} \right] = 0 \Rightarrow$ Devaluation will bring no change in BOP.

If $\left[\frac{\varepsilon_x (\eta_x + 1)}{\varepsilon_x + \eta_x} + \frac{\eta_m (\varepsilon_m - 1)}{\varepsilon_m + \eta_m} \right] < 0 \Rightarrow$ Devaluation will result in further deficit in the BOP

The sources of the policy suggested by this approach rest upon the following conditions:

Primary conditions

i. Underdeveloped economy
ii. High substitutability between homes produced goods and foreign produced goods.
iii. High elasticity of supply of and demand for the goods and services.

Sufficient condition

Marshall-Learner condition should be satisfied.

Shortcoming

i. A partial equilibrium analysis is inappropriate in dealing with the phenomenon of the BOP which is an aggregate phenomenon.
ii. The underlying assumptions of the elasticity approach may not exist in reality and hence the approach as limited applicability.
iii. This approach can't be considered appropriate to analyze the effects of any change in exchange rate on the real output and money variables of the economy.
iv. This approach is less applicable in empirical study especially in developing countries like Nepal.

2.3.2. The Absorption Approach:

The absorption approach was developed by Alexander 1952. It provides an alternative approach to the elasticity approach. This approach is based on Keynesian national income relationship. Hence, this approach is also known as Keynesian approach. This approach emphasizes change in the real domestic income as the determinant of the nation's BOP. This approach treats price to be constant and the other variables are the real measures.

This theory states that if a country has a deficit in its BOP, it means that people are absorbing more than they produce which implies the domestic expenditure on consumption and investment is greater than national income and vice versa. The main cause that creates disequilibrium in the BOP is the consumption of the domestic residents. So, whether the current account improves or deteriorates depends on the relative changes on the domestic income and the domestic expenditure.

Alexander clearly emphasizes the macroeconomic model of aggregate demand and supply to analyze the BOP problem for an economy. According to him,

$$Y = C+I+G+(X-M) \quad \text{..... (4)}$$

Where,

Y= Output or income or aggregate supply

C+I+G+(X-M) = Aggregate demand

C = Consumption expenditure

I = Investment expenditure

G = Government expenditure

X = Export

M = Import

Then C+I+G are combined into a single tern A which represents the domestic absorption (i.e. total domestic expenditure). Thus,

$$Y = A + X - M$$

Or, $X - M = Y - A$

If the difference between export and import is denoted by current account (CA), all expenditure C, I and G are termed as absorption and denoted by A, then above equation can be re-arranged as

$CA = Y - A$ ..... (5)

Equation (5) is the fundamental equation of the absorption approach which states that $CA>0$ if $Y>A$ and $CA<0$ if $Y<A$. It implies that if total absorption (expenditure) exceeds income (production), then imports will exceed exports resulting in the CA deficit. If the opposite occurs, when income exceeds absorption, then the CA will be in surplus. So BOP deficit through CA can therefore only be corrected if the level of absorption changes relative to the level of income.

These two alternative approaches are in common for assuming BOP disequilibria are permanent. Furthermore, both approaches have been criticized mainly for not taking into account the capital account of the BOP. These mechanisms concentrate only the on the current account and ignore the particular impacts of capital movements on the BOP. Fundamentally, both the approaches deal with the problem of BOP through the current account. So, they are related with each other in this particular ground. The deficit in current account according to the elasticity approach is because of the wrong prices prevailing in different countries. For example, if a country is in deficit, it clearly indicates that the domestic residents are importing more than they produce. It is because the fact that the foreign goods and services are cheaper in comparison to the domestic goods and services. Also the deficit means the domestic residents have high purchasing power and induces the domestic residents to increase the imports. It also states that the foreign currency has low purchasing power in comparison to the domestic currency and foreigners will have to reduce their demand for imports. Both the reduction in exports and increase in imports are the main causes of BOP deficit. Similarly, absorption approach assumes that the BOP deficit is due to the higher absorption or consumption in comparison to the income of the domestic residents. This situation is equivalent to increase in import and decrease in export which is the testimonial of increase in absorption in comparison to the income. This is because the imports are taxed by the exchange rate policy, so the cumulative effect give rises to the additional consumption of

goods and services. In this approach too, a deficit that is increase in absorption is associated with the wrong prices. The same conclusion as derived by the elasticity approach. In this way the deficit in the BOP according to both the approaches related to the wrong price. Hence, both the approaches are related with each other only dealing with different interpretations.

2.3.3. The Monetary Approach:

Monetary approach to Balance of Payments is the modern version of the classical price specie flow theory developed by David Hume (1966) in the eighteenth century. The proponent of this modern version of the Monetary Approach to the BOP are Johnson, Mundel, Frenkel, Musa, Swoboda and the economists in the IMF (Polak, 1957; Argy1969 and Khatiwada, 1992). The monetary approach regards the balance of payments as a monetary phenomenon and expresses the relationship between a country's BOP and its money supply and money demand. Furthermore, it argues that there is disequilibrium in the money market if there are surpluses and deficits which ultimately causes BOP problem. Deficits are caused by money supply exceeding money demand, while surpluses are caused by money demand exceeding money supply. The monetary approach, therefore, largely emphasizes the monetary implications of BOP disequilibria.

The monetary approach assumes money supply plays a vital role in the balance of payments, by altering the cash balances of the people. So, if the money supply is in control, the whole problem is solved. In a modern banking system, the structure of the money supply is a sum of NFA and net credit creation. And, in open economy, the monetary authority cannot control net foreign assets because in the absence of restrictions people can demand and sell foreign assets as they wish. However, the monetary authority has full control on credit creation and has control over part of the money supply. If the demand for money is the function of income, price and interest, the monetary authority has no control over money demand. It is because monetary approach assumes income is an exogenous variable, price and interest are pegged to the rest of the world, therefore demand for money is given. In this way, in the monetary approach to balance of payments, the only policy variable is domestic credit creation.

The monetary approach incorporates a money supply identity, money demand function, and an equilibrium condition. The model consists of the following equations:

$M^s = (F+C)$

$M^d = Pf(Y,I)$

$M^s = M^d$

Where,

M^s= money supply

F = net foreign assets

C = domestic credit

M^d=money demand

Y = income

P = price level

I = rate of interest

Equating change in money demand and money supply, and isolating NFA

$\Delta M^d = \Delta M^s$

$\Delta [Pf(Y, I)] = \Delta [F+C]$

$\Delta F = \Delta [Pf(Y, I)] - \Delta C$..... (6)

Equation (6) is the basic equation of the monetary approach, stating that BOP is the result of divergence between the growth of money demand and the growth of domestic credit, whilst the monetary consequences of the BOP bring the money market into equilibrium. With money demand being stable, an increase in domestic credit will cause an equal and opposite change in international reserves. The coefficient of ΔC is, therefore, known as an offset coefficient and it shows the extent to which changes in domestic credit are offset by changes in the money supply as a consequence of a loss in international reserves (Khand, 2010).

The monetary approach believes that the disequilibrium in the BOP is the disequilibria in the supply and demand for NFA (Johnson, 1977). If the people demand more foreign assets than they supply to the monetary authority in the economy is said to be in deficit and vice versa. So, to correct BOP disequilibrium, the demand and supply of foreign assets should be maintained in equality. But if we see the working of monetary approach,

we find that it is self correcting in nature. This is because, if supply of foreign assets is more than demand, the money supply will increase. When money supply increases people find themselves with cash holdings in excess of what they desire to hold. So, people will have to adjust their wealth in a new way. Adjustment of cash holding to new way means adjusting their absorption. In a situation of excess cash holdings, people increase their absorption and this increment in absorption includes increment of absorption for foreign goods and services. So, some fraction of the surplus in the BOP leaks to foreign country and this leaking process continuous till it comes to equilibrium position again. But, this process takes time and the economy may not have sufficient foreign reserves to carry out this adjustment. So, some temporary measure to correct the disequilibrium is needed. It is also reasonable to argue that sometimes the monetary authority may be in need of more foreign assets for developmental processes. Therefore the monetary authority may be unwilling to permit the depletion of foreign reserves required by adjustment process and may enact other corrective polices. This analysis suggests that if a country is running a deficit, then assuming that the economy is growing at its full employment with a given rate of technological progress, should curtail its rate of domestic monetary expansion. Use of other measures like the imposition of tariffs, devaluation or deflation of aggregate demand by fiscal policy can succeed only in the short run. Thus, the domestic assets is the only variable which the monetary authorities control, and, thereby, indirectly control the BOP.

The Monetary approach to balance of payment is the superior approach to study the BOP problem in the developing countries because of the availability of the proper data. For the empirical study of the Elasticity and Absorption approach to the balance of payments, there is the problem of proper data. Thus it is very difficult to do empirical study about elasticity and absorption approach to balance of payment.

There are several theoretical and empirical studies conducted by various researchers and academicians on the topic. Some of the important literature on the subject is reviewed in this chapter. In the review of literature only the major findings and conclusions of the study are considered.

According to Johnson (1958) deficit in BOP implies either dishoarding by residents or credit creation by the authorities, that is and deficit in BOP is either due to an increase in the velocity or due to an increase in the supply of money. A deficit is associated with increasing velocity of money or increase in the supply of money.

In an essay "The Monetary Approach to BOP" published in 1977, Johnson says that in a growing economy a deficit will develop if domestic credit expands more rapidly and sufficiently than real output or the growth rate of international reserves. According to him, domestic credit is the only effective, efficient and reliable long run policy to get rid of the BOP problem, which is within the control of the international policy making authorities. He believes that implementing the policies such as devaluation, import restriction or export subsidization may create surplus in BOP. But it is temporary.

Mundel (1971) developed BOP adjustment model and tries to link with other macro variables such as rate of inflation, rate of credit creation, money stock. His model shows that money can have a direct effect on the BOP through its immediate impact on expenditure, part of which inevitably falls on imported goods. He has suggested that authorities should keep in mind that bank's credit expansion rate should be more or less equal to growth rate of the economy. He believes that for a given rate of credit creation the BOP is determined by the growth rate of transactions and output of the goods and services. In most cases domestic credit creation is a positive function of the domestic growth rates.

2.4 Empirical Studies on Balance of Payments: International Context

In international context, the monetary approach to balance of payments was firstly introduced by David Hume in eighteenth century. In his classical specie flow mechanism theory, he had criticized the mercantilists. According to mercantilists, prosperity of a country depends upon accumulation of species, whereas to Hume, this philosophy is wrong. He argues that the inflow of species will increase money supply and raise the price level in the country which makes export costly and reduced the foreign demand for domestic goods. It will induce larger imports from abroad because the foreign goods will

become relatively cheap to the residents. Reasoning this way Hume concludes, in the long run, accumulation of species can not improve the economic situation of a country. In the same manner, dishoarding of species cannot last for long period of time. Using the framework of David Hume's classical price flow mechanism, economists have developed the modern version of the monetary approach to the balance of payments. Johnson's model and Aghevli – Khan's model are very popular towards the development of modern version of the monetary approach to the balance of payments.

Mundel (1968) developed a model shows that money supply affects directly on the balance of payments through its immediate impact on expenditure and of which inevitably falls on imported goods. According to him, government finds that its deficit is really being financed from foreign exchange reserve, if it tries to finance its deficit by increasing credit creation. According to him, money supply can grow slower as well as faster than growth rate of credit creation by the central bank and it all depends upon balance of payments position of the country. He further says that provision should be made for an increase in the money supply every year for a growing economy. He has suggested that authorities should keep in mind that the central bank's credit expansion should be more or less equal to the growth rate of the economy.

Frenkels (1971) attempted to develop a balance of payments model by integrating monetary and real sector for both the production and consumption. According to him, overall balance of payments is associated with growth rate of economy which is determined simultaneously by liquidity needs of consumers and producers. He further states that growth rate of population is one of the determinants of the balance of payments and it will have a negative impact on overall balance of payments of a country. Regarding credit expansion, he opines that a country having no strong foreign currency reserve could not pursue a steady state of credit expansion. It is because it will exceed the domestic flow of demand for money. A country having limited foreign reserves looses persistently its stock of foreign reserves, the monetary authority will have to either reduce rate of credit expansion or adopt floating exchange rate system in the country.

Johnson (1972) in his essay "The Monetary Approach to the Balance of Payments Theory" presented a new approach to analyze balance of payments problem. He suggested various methods of correcting the problem of balance of payments problem. According to him, monetary policy can control volume of domestic credit and the country's international reserves and ultimately to the balance of payments. The growth of international reserves and balance of payments are positively related to the demand for money and negatively related to the growth of domestic credit creation. Similarly, growth of international reserve and balance of payments are positively related to income elasticity of demand for money and negatively related to the rate of domestic credit expansion. The NFA of a country will gain faster than the rate of growth of total reserve, if its real growth rate exceeds the world average growth. In the same manner, if its rate of domestic credit expansion is blow the world average, it will gain the NFA faster than the rate of growth of total reserves and vice versa. Regarding devaluation, he says that devaluation to equivalent to domestic credit contraction, but it is for short affair and is not lasting for long period of time. It can be only a transitory factor that improves balance of payments for a short period of time. Lasting improvement in BOP can only be achieved by reducing the rate of domestic credit expansion.

Zecher (1974) examined the balance of payments problem of Australia for the period of 1951-71 using the monetary approach to balance of payments and found that the foreign asset flow of Australia had one is to one positive impact of change in domestic credit creation and money multiplier and one is to one positive impact of growth rate of real income. He found that a rise in price level also leads to surplus in balance of payments. According to him, effect of change in interest rate on the foreign asset flow is feeble and confirms the theory of having the negative relationship between these two variables. According to him, reserve inflow can be stemmed or reserved by a more expansionary domestic monetary policy and an exchange rate adjustment will at best provide temporary relief from undesirable reserve flows. Thus, prior to implementing the policies to correct balance of payments problem of Australia, this information is worth considering.

Bean (1976) estimated equation of the foreign flow of Japan for the period of 1959-70. This study indicates that the foreign asset accumulation is positively related to growth

rate of domestic income but domestic income elasticity of the NFA is smaller than unity in Japan. The foreign asset accumulation of Japan was found negatively correlated with growth rate of domestic credit expansion. Interest rate had negative impact on reserve accumulation. A significant positive causal relationship was determined between change in the price level and reserve accumulation. He concludes, through a discretionary credit creation policy, authority can minimize the foreign asset flow of the reserve but it will have an adverse impact on economy (Beans, 1976).

Genberge (1976) studied Sweden's balance of payments for the period 1950-68 by using Johnson's model and found that there was a one to one negative relationship between domestic credit and foreign reserves. The coefficient of money multiplier was not significantly different from minus one and coefficient of price level as a variable was near to plus one. Money multiplier and price change have a significantly negative and positive impact on balance of payments respectively. The coefficient of income and interest were found insignificant. In his study, he found highly significant positive relationship between the change in government debt outstanding and domestic credit expansion and a negative relationship between change in international reserve and domestic credit expansion (Genberge, 1976).

Khan (1977) constructed a model to analyze the determinants of income and the balance of payments of a country. This monetary model was applied to ten developing countries for the period 1952-70. Despite some obvious dissimilarities between countries, most of the estimated coefficients in his study appear to be same order of magnitude. Certain common results emerged, while the model was used to estimate balance of payments for individual countries. According to his finding, current nominal income has a positive and significant effect on change in export. Aggregate nominal expenditure and NFA both appeared to affect in nominal imports positively as well as significantly. Estimated coefficients of money supply and income both were found significantly and positively related with the expenditure (Khan, 1977).

Aghevli and khan (1977) developed a monetary model to estimate the determinants of the BOP. Cross section data of 39 developing countries for the period of 1955-66 was used to

test their model. In the study price level, inflation, income and domestic assets were used as explanatory variables in the model. According to their study an increase in the price and income will lead to an improvement in the BOP. The impact of the growth in domestic assets and money multiplier on balance of payments were negative. In their study the coefficient of inflation was found substantially less than unity. Their study found one to one correspondence between domestic assets and BOP. And there was positive relationship between economic growth and balance of payments.

Bhatia (1980) conducted a study to examine the BOP and monetary policy of India for the fixed exchange rate regime. In this study, he had used prices income, money multiplier and the domestic credit as explanatory variables and found that the coefficient of these variables were close to unity and were significant at 5 percent level of significance. There was positive impact of the growth rate of income and price level on foreign reserve flow. And an increase in interest rate, money multiplier and domestic credit expansion had a negative impact on foreign reserve flow.

Kannan (1989) examined the impact of excess money demand on various components of the BOP and found that most of them were affected by monetary disequilibrium. He concludes that to achieve favorable BOP in the country, the monetary authority should stabilize the domestic money market.

2.5 Literature Review on the Empirical Studies of the Monetary Approach to the Balance of Payments in Nepal

McNown (1980) conducted a test on the monetary approach to balance of payments for Nepal for the period of 1958-1978. He observed macroeconomic policy variables such as import quotas, tariffs, dual exchange rate regimes and export promotion activities designed to correct the balance of payments were ineffective. Rather he found that there is one for one relation between net domestic creation and the loss of foreign assets. And, he has recommended that domestic credit creation or contraction is more effective tool which can correct the deficit in the balance of payments for long period of time.

Mainaly (1981) tried to find out significant factors causing balance of payment problem in Nepal. He used Johnson's small country model and Aghevli Khan Model to analyze the data for the period of 1964-1980. The study shows that domestic credit creation can be used effectively to influence surplus or deficit in the balance of payment. This study also shows that an increase in income increases the overall balance of payment. He also found that the use of exchange rate as a policy variable will not help to correct the balance of payment problem. His study reveals that the monetary approach to the balance of payment is an efficient tool to study the balance of payment problem of Nepal.

Upadhyaya (1983) analyzed the balance of payment in Nepal for the period of 1974-82. He separated total imports from India and imports from other countries. Expenditure elasticity of imports for India was lower than that from other countries. In general, imports from India were found inelastic but those from the rest of the world were found highly elastic. Goods imported in Nepal were found price inelastic in the long run. in the study, Upadhyaya found that an increase in net domestic asset increases money supply and to some extent the expenditure, GDP, price and imports in the short run. But in the long run, the growth rate of imports was found more influenced than other variables. An increase in imports causes a deficit in the balance of payments as it reduces the net assets holding of the central bank. He concluded that the use of credit policy by the Nepal Rastra Bank to enhance the long run growth of the Nepalese economy is inappropriate because it would bring about a permanent decrease in international reserve of the country.

Upadhyarya (1983) analyzed the relationship between deficit financing and balance of payment in Nepal for the period of 1970-82. He found out that an increase in the government expenditure increases government demand for credit from the central bank which ultimately increases money in which in turn increases domestic price level and imports. Increase in imports increased current account deficit, which in turn, had a negative effect on the international reserves of the central bank. According to his findings there was positive association between government expenditure and credit creation and negative association between the domestic credit creation and the international reserves of the central bank.

Shah (1993) analyzed the balance of payments problem of Nepal for the period of 1964-92 and tried to detect the significant factors that influence balance of payments of Nepal. She found that domestic interest, money multiplier, net domestic assets, changes in GDP and India's expected rate of inflation are significant factors to influence Nepal's balance of payments. In her study, Indian bank interest and money market interest have a positive impact on balance of payments of Nepal, but were not significant. She recommended that government should regulate monetary variables to bring favorable position in balance of payments. According to Shah, the major monetary variables are interest, expected inflation, money multiplier, net domestic assets and high powered money. She also recommends that Nepal should closely observe and monitor the change in India's expected rate of inflation and take corrective countervailing measures.

Khatiwada (1992) tested the impacts of different economic variables on the balance of payments of Nepal for the period of 1965-1990. He found that nearly one to one negative association between changes in net domestic credit and NFA of the monetary authority. Money multiplier and required reserves were found significant factors affecting NFA negatively and positively respectively. In his findings, real income and domestic prices were found significant positive effect on NFA. The coefficient of foreign prices were found less significant indicating that Nepal does not have a perfectly open economy, i.e. domestic price are not determined by international prices alone. Results of his test show that changes in exchange rate have no impact on foreign assets flow. It is because the variable was found insignificant in his study. Furthermore, he says that exchange rate adjustment should be viewed as a tool to stabilize price rather than the balance of payments.

Institute of Sustainable Development (1994) analyzed the balance of payments problem of Nepal with India and found that problem is basically of monetary nature. Empirical analysis shows that an excess supply of money compared to its desired level generates additional demand for goods and services in the economy. As supply response of domestic economy is weak due to structural rigidities in production, additional demand is met through imports. The results of the test indicate that one rupee increase in net domestic assets of the banking system causes a proportional deficit in the balance of

payments wit India. Therefore the study recommends domestic credit control of the banking system to achieve favorable balance of payments with India.

Malla (1994) has analyzed the balance of payments of Nepal for the period of 1965-93 using monetary approach and he found that there is one to one negative and significant impact of the change in net domestic credit creation on change in net foreign assets reserve of Nepal. According to him, increase in domestic credit leads to an increase in the money supply which create additional demand for goods and services in the domestic economy, resulting net increase in import of goods and services and outflow of foreign assets reserve to the abroad. In this way, as domestic credit creation increases, net foreign assets of the country decreases nearly by the same amount and vice versa.

Sunar (2003) analyzed the balance of payment of Nepal for the period 1983-2001. He found that GDP as negatively related with foreign asset reserve of Nepal with small magnitude. Similarly, the interest rate and money multiplier were found to be negatively associated with the net foreign assets in Nepal, though the magnitudes of these variables were very minimal. But change in net domestic assets had nearly one to negative impact on change in net foreign asset of monetary authority in Nepal. He recommended that domestic credit was only policy variable that could be very effective to correct balance of payment problem in Nepal.

Karki (2007) analyzed the balance of payment of Nepal for the period 1965-2005 using Bijan B. Aghevli and Mosin S. Khan model and Johnson's small country model. He found that growth rate of income is statistically insignificant to change net foreign asset of Nepal. The growth rate of domestic price level has significant positive impact with very small coefficient to change the net foreign asset. The domestic interest is found to be statistically significant variable to influence net foreign asset holding of the monetary authority of Nepal, though the variable produces very minimal effect. Money multiplier is found to be highly significant and the coefficient of this particular variable is tending to minus one. He concluded that the desired change in the Net Foreign Asset reserve of Nepal can be achieved by managing the supply and the demand for money effectively.

Khand (2010) analyzed the macroeconomic variables on balance of payments for the period 1978-2008 using Johnson's small country model. He found that growth rate of income is statistically insignificant to change ratio of net foreign asset to money supply of Nepal. The growth rate of domestic price level has significant positive impact to the change in the ratio of net foreign asset to money supply of Nepal. He found the growth rate of domestic interest rate on net foreign assets is inconsistent and statistically insignificant. And, the domestic credit creation is found statistically very significant and consistent to influence the NFA.

To sum up, there are three major theories in the field of international economics that explain the BOP disequilibrium and movement of international reserves. One of them is monetary approach to balance of payments. The above literature review proves that researchers have been increasingly using MABP to understand and explain the BOP fluctuations. The present study employs the MABP to explain the relationship among monetary policy, domestic credit policy and flow of international reserve in the context of BOP for small and open economy like Nepal. This study is vital importance. It is all because of the fact that the BOP study of Nepal by using monetary approach was carried away in 2007. The time after that, the study of BOP by using monetary approach is not being carried out and this study tries to cover the gap. The variables that I have used in this study have been studied separately; their simultaneous study on the overall BOP. So, the present study has the main motto of the finding out these specific variables that have influenced the fluctuation in the overall BOP of the small developing countries like Nepal.

CHAPTER - THREE

METHODOLOGY

3.1 Sources of Data

This study is completely based upon the secondary sources of data. The time series data are used in this study. The secondary sources of data are mainly taken from various publications of Nepal Rastra Bank (NRB), Central Bureau of Statistics (CBS), Ministry of finance (MOF), National Planning Commission (NPC) and International Monetary Fund (IMF) for the period 2064/65-2009/10. The variables descriptions alone their sources are explained below:

- The source for the net foreign assets (NFA or F) is Quarterly economic bulletin of NRB;
- The credit creation (C) is for narrow money (M_1) and its source is Quarterly economic bulletin of NRB;
- Real output (Y) is measured by real GDP of the constant price of 2000/01. The series is calculated using various issues of Economic survey and deflated by the GDP deflator taken from same source;
- Domestic price level (P) is measured by the National Urban Consumer Price Index (CPI) taken base year 1995/96 and its source is Quarterly economic bulletin of NRB; and
- The domestic interest rate (I) is measured in the form of fixed deposit rate of commercial banks for one year and it is taken from Quarterly economic bulletin of NRB and from the publication of Research department of NRB on 2009, Inflation in Nepal.

3.2 Data Analyzes/Processing

The monetary approach to balance of payments is applied for selecting and forecasting the influencing macroeconomic variables for the balance of payments. The monetary approach to Nepal's balance of payments is tested on the basis of annual data taken from

various secondary sources. To analyze the data and reach the conclusions statistical tool like regression equations are used in the study. The estimation of coefficient values of explanatory variables are used in the regression model is done by using SPSS computer program.

3.2 Study Period

In this study, sample period of 45 years that is from 1964/65-2009/10 has been taken to test the monetary approach to the balance of payments in Nepal. The sample period is chosen because of the cause of the major economic reform programmes and political changes have been occurred from 1963/64 in Nepal and availability of the data for this period.

3.3 Definitions of the Variables Used in the Model

a. F: It is net foreign assets reserve (NFA) of the consolidated banking system. The net foreign assets reserve of the consolidated banking system is simply calculated by subtracting foreign liabilities from foreign assets.
b. C: it is defined as net domestic assets (NDA) which is also known as net credit creation. It is the sum of claims to the government; government enterprises, commercial banks and private sectors minus net capital and other items. It is net credit creation of the consolidated banking system for M_1 definition of money.
c. M_1: It is narrow money supply which is also called M_1 definition of money and is the sum of the foreign asset reserve (F) and net domestic credit creation (C) of the consolidated banking system.
d. M_2: It is broad money supply which is also called M_2 definition of money and is sum of the narrow money supply (M_1) and time deposits.
e. Y: It is real GDP which is used as proxy for the real income.
f. P: It is price level which is measured by the consumer price index.
g. I: Interest rate paid by the commercial banks to the depositors, who deposit their money in the bank for a fixed period of one year is considered as the representative of the various interest rate prevailed in the market.

3.4 Adoption of the Model

To study the balance of payments problem, there are three different approaches, namely, the elasticity, the absorption and the monetary approach. The elasticity and the absorption approaches study only the current account of balance of payments. So they are able to provide the main sources of the problem but fail to include capital account. The monetary approach studies the monetary authority account that is to study the overall balance of payments account. Thus, the elasticity and abortion approaches are complementary to monetary approach instead of substitutes. The monetary approach explains the final effect, whereas the elasticity and abortion approach describe the channel of the final effect.

The elasticity approach assumes the following collections exist in the economy:

1. Excess productive capacity in the country.
2. The domestic and foreign goods and services are substituted to each other without any restrictions.
3. Fulfillment of the Marshall-Learner condition, that is the sum of the elasticity of the demand for and supply of exports and imports are greater than one.

The absorption approach assumes the following collections exist in the economy:

1. Full employment.
2. Inflationary pressure in the economy.
3. Perfectly elastic money supply, i.e. the money supply is determined exogenously.

The policies prescribed by the elasticity and absorption approaches to correct the balance of payments problem work if and only if the conditions spelled out in the elasticity and absorption approaches are met by the economy.

If we consider the realities and the features of the Nepalese economy, we find that the necessary condition for the success of the policies prescribed by the elasticity and absorption approaches do not exist in the Nepalese economy, that is the assumptions of both the approaches are not met the Nepalese economy. Even if we discard the above mentioned assumptions by the two approaches in Nepal, we face the data problem. Both of the approaches need a complete and accurate data on price index and amount of

imports and exports of goods and services and total income and expenditure of the country. Due to open and free boarder with India and lack of special attentions to keep accurate data, it is impossible to find a comprehensive and detailed data on the above mention variables in Nepal. On the other hand, monetary approach requires only money supply, price level, income and interest rate which are available in Nepal.

The monetary approach assumes the following assumptions in the economy:

1. A small and open country.
2. The price level and interest rate of the country are equal to their respective world's price level and interest rate respectively. That means, there is perfect mobility of goods and financial assets in the economy and the price and interest rate are exogenously determined.
3. Output is also determined exogenously in the country maintains a fixed exchange rate.

The assumptions of the monetary approach are mostly met by the Nepalese economy.

1. The economy of Nepal is open with India and almost open to the rest of the world. With some exceptions international transactions are not restricted.
2. Nepal can be said small country. It is because its size is smaller than most of the countries of the world and economy is also small because its economy does not have any impact on other countries. The change in economic polices of other countries directly determines the policy formulation process of Nepal. In the past to keep the economy in balance, Nepal was compelled to follow the policies of other countries. In this regards, Nepalese economy has been highly influenced by Indian economy, due to her high dependency upon India. For example, in 1966, a higher interest rate in India compelled Nepal to increase its interest rate. But change in economic policies in Nepal does not affect other countries policy formulation process. In 1976, the interest rate in Nepal for time deposit was 15 percent, whereas in India it was 9 percent. If the high Nepalese interest rate was able to distort to Indian economy, the Indian interest rate might have been raised by the Indian policy makers; on the contrary, Nepalese policy makers were bound to reduce its interest rate. Those two historical events indicate that Nepal is a

small country and her economy cannot affect other countries economy (Mainaly, 1981). With the help of this information, we can say that Nepal is bound to follow Indian policy to maintain stability in its economy.

3. Nepal has little control over the price of goods and services, they are determined in the world market. The Indian wholesale price has a significant impact of price level of Nepal (Khatiwada, 1981). So, we can say that Nepal has little controlled over its prices. The price situation of other countries highly influenced the price index of Nepal.
4. Agriculture is the main stay of the Nepalese economy. A large portion of GDP is generated from agriculture sector. Due to fixed land, lack of irrigation facility, fertilizer, skilled manpower, modern technology and equipment, the agriculture production of Nepal is more or less fixed. Thus the Nepalese productions are nearly price inelastic that is supply cannot be increased as desired. Nepal exports staple and necessary goods. Those goods are usually price inelastic. So the demand for those goods cannot be increased by reducing their prices. Most of the goods imported in Nepal are necessary goods, so those goods are also price inelastic.
5. Although Nepal has experienced rigid and managed floating exchange rate system in the study period, the exchange rate with IRs has been pegged for the study period.

The above mentioned evidences show that the features of Nepalese economy are compatible to the assumption of the monetary approach to the balance of payments. In this way, the monetary approach to the balance of payments seems to be best and appropriate tool to analyze the balance of payment problem of Nepal. Besides, many researchers have done various researches on the balance of payments problem of different countries, applying monetary approach to the balance of payments. They have found that the monetary approach to the balance of payments has a high predicting power and its policy variable are useful tools to influence the balance of payments problem of these countries.

Historical evidences also suggest that monetary approach is one of the best tools to study and to correct the balance of payments problem of a country. In 1967, England tried to correct deficit in its balance of payments with the help of the policy tool prescribed by the traditional approaches that is devaluating its currency but was unable to correct the deficit in its balance of payments. Finally she was bound to apply the policy by the monetary approach to the balance of payments to correct its deficit in balance of payments (Johnson, 1972).

Considering the above mentioned evidences and geographic and economic situations of Nepal, the monetary approach to balance of payments is used to analyze the balance of payment problem of Nepal.

3.5 The Model

Literature review also suggests and proves that in small and developing country like Nepal where there is a problem of data and the economy is not fully monetized, the monetary approach to balance of payments is the best tool to study the balance of payments problem. The traditional approach namely elasticity and absorption approach are not appropriate and historical evidences have already proved this fact. Johnson Small Country model is used to analyze the overall balance of payments problem of Nepal in this study. Thus, the influence of the different macroeconomic variables on the NFA is studied with the aid of the Johnson's model. The monetary approach to the balance of payments specifies a money supply identity, money demand function, and an equilibrium condition.

The model is based on the following assumptions:

1. There is monetary equilibrium in a country.
2. The country maintains a fixed exchange rate.
3. The country is small and diversified enough in relation to the world economy for its price level and its interest rate which are equal to the world price and the interest rate respectively.
4. The country grows over the time.

5. The supply of money is instantaneously adjusted to the demand for it.

a. The Demand for Money

With the assumption of standard homogeneity postulate of monetary theory, demand for money depends upon the real income and opportunity cost incurred in holding the money. The opportunity cost of holding money can be represented by the yield on alternative financial assets, the interest. So, the demand for nominal money can be specified as:

$M^d = Pf(Y,I)$.....(7)

Where,

M^d = Nominal quantity of money demanded

P = Price level

Y = Real output or income

I = Interest rate, that is opportunity cost of holding money

The functional form in equation (7) implies that nominal demand for money is homogeneous of degree one in price level that is there is no money illusion among the people. The equation also implies that M^d is the function of income (Y) and interest rate (I).

Converting the demand for money in terms of growth rates,

$\dot{M}^d = \dot{P} + \eta_Y \dot{Y} + \eta_I \dot{I}$ ..... (8)

Where,

$\dot{M}^d = \frac{M_t^d - M_{t-1}^d}{M_{t-1}^d}$ = Growth rate of demand for money

$\dot{P} = \frac{P_t - P_{t-1}}{P_{t-1}}$ = Growth rate of price

$\dot{Y} = \frac{Y_t - Y_{t-1}}{Y_{t-1}}$ = Growth rate of output or income

$\dot{I} = \frac{I_t - I_{t-1}}{I_{t-1}}$ = Growth rate of Interest

η_Y and η_I are the corresponding elasticities of income and interest.

b. The Supply of Money

The supply of money is the sum of the net foreign assets and the net credit creation of the consolidated banking system. Hence, the money supply is simplified as:

$M^s = F + C$ ..... (9)

Where,

M^s = Money supply

F = Net foreign assets of the consolidated banking system

C = Net credit creation of the consolidated banking system

Making difference for t and t-1 time,

$$M_t^s - M_{t-1}^s = (F_t - F_{t-1}) + (C_t - C_{t-1}) \quad \text{..... (10)}$$

Dividing both sides of equation (10) by M_{t-1}^s,

$$\frac{M_t^s - M_{t-1}^s}{M_{t-1}^s} = \frac{(F_t - F_{t-1})}{M_{t-1}^s} + \frac{(C_t - C_{t-1})}{M_{t-1}^s} \quad \text{..... (11)}$$

Where,

$$\dot{M}^s = \frac{M_t^s - M_{t-1}^s}{M_{t-1}^s} = \text{Growth rate of money supply}$$

$$F^* = \frac{(F_t - F_{t-1})}{M_{t-1}^s} = \frac{(F_t - F_{t-1})}{M_1} = \text{Ratio of change in NFA to money supply } M_1.$$

$$C^* = \frac{(C_t - C_{t-1})}{M_{t-1}^s} = \frac{(C_t - C_{t-1})}{M_1} = \text{Ratio of change in C to money supply } M_1.$$

c. Equilibrium of Money Market

Equilibrium of money market signifies equally of demand and supply of money or the growth rate of money supply and growth rate of money demanded.

$$\dot{M}^s = \dot{M}^d$$

$$F^* + C^* = \dot{P} + \eta_Y \dot{Y} + \eta_I \dot{I}$$

$$F^* = \dot{P} + \eta_Y \dot{Y} + \eta_I \dot{I} - C^* \quad \text{..... (12)}$$

This is H.G. Johnson Small Country model. Equation (12) is the basic equation, which shows the monetary relationship in the balance of payments. It can be used to estimate and to test monetary implications of the balance of payments. The model aims to show

whether variables are central to determining the balance of payments in Nepal. In order to test this model, the study will use the standard model of the balance of payments as follows:

$$F^* = b_0 + b_1\dot{Y} + b_2\dot{P} + b_3\dot{I} + b_4C^* \quad \text{..... (13)}$$

The variables used are NFA, gross domestic product, price level, interest rate and domestic credit. Income, price level and interest are expressed in terms growth rates. NFA and domestic credit are expressed as ratios of changes of these variables over one period to money supply M_1.

3.6 The Econometric Tools Used

i. To estimate the equation of BOP the classical linear regression equation model is used.

ii. The overall explanatory powers of the independent variable is gauged by R^2 and $\bar{R}^2$. Where R^2 is interpreted as the percentage of the variation in dependent variable explained by the regression equation.

iii. The explanatory power of the independent variable that is the significance of the independent variable in the estimated regression equation is tested by using t-test.

iv. Durbin-Watson test (D-W test) is applied to test the problem of autocorrelation in the regression equation.

v. The Presence of multicollinearity is tested with the help of Variance Inflating Factor (VIF).

vi. White test is applied to test the problem of heteroscedasticity in the regression equation.

CHAPTER - FOUR

Result of the Study

4.1 Empirical Results

The main aim of this section is to test the monetary approach to balance of payments is applicable to Nepal. The section presents the empirical results and analysis of the study.

4.2 Summary Statistics

The summary statistics for the ratio change in NFA to money supply, growth rate of GDP, growth rate of price level, growth rate of interest rate and ratio of changes in domestic asset to money supply are presented in Table 1. The table displays the summary statistics for the sample period of 1964/65-2009/10 and thus there are 45 observations for each variable since it is the growth rate of change. Column 1 reports the variable lists, column 2 reports the number of observations for the sample period, column 3 and 4 report the mean and standard deviation, and the last columns 5 and 6 report the minimum and maximum values of the variables.

Table 1: Summary Statistics

Variable	No. of Observations	Mean	Standard Deviation	Minimum	Maximum
F*	45	7.64	11.55	-22.11	47.07
$\dot{Y}$	45	3.83	2.52	-1.64	8.93
$\dot{P}$	45	7.90	5.03	-0.65	21.07
$\dot{I}$	45	3.26	26.68	-26.67	150.00
C*	45	10.29	9.13	-14.25	30.17

Source: Derived from Appendix B.

For the ratio of change in NFA to money supply, mean is 7.64 and standard deviation is 11.55. The largest and the smallest value are 47.07 and -22.11 respectively. For all the variables, mean is highest for the ratio of change in domestic asset to money supply and standard deviation is the lowest for the real GDP.

Table 2: Correlation Matrix

Correlation	F*	$\dot{Y}$	$\dot{P}$	$\dot{I}$	C*
F*	1.000				
$\dot{Y}$	-0.024	1.000			
$\dot{P}$	-0.267	0.233	1.000		
$\dot{I}$	0.176	-0.067	0.266	1.000	
C*	-0.818	0.220	0.471	0.058	1.000

Source: Derived from Appendix B.

The correlation matrix of the variables is shown in Table 2 and shows moderate correlation between the ratio of change in NFA to money supply and the growth rate of GDP, growth rate of price level, growth rate of interest rate and the ratio of change in domestic asset to money supply. However there is a positive correlation of the ratio of change in NFA to money supply with growth rate of interest rate, and a negative correlation with growth rate of real GDP, growth rate of price level and the ratio of change in domestic asset to money supply. The correlation is very high between the ratio of change in NFA to money supply and the ratio of change in domestic asset to money supply.

4.3 Estimation of the Relationship

The OLS technique is applied to explore the relationship between the macroeconomic variables. A multiple regression model has developed to explore the relationship, where the ratio of change in NFA to money supply is taken as dependent variable and growth rate of real GDP, growth rate of price level, growth rate of interest rate and the ratio of change in domestic asset to money supply are taken as independent or influencing variables. The result obtained from the regression equation is given as:

$$F^* = 14.933 + 0.802\,\dot{Y} + 0.125\,\dot{P} + 0.097\,\dot{I} - 1.133\,C^*$$

t	(7.413)	(2.133)	(0.580)	(2.726)	(-9.949)
s.e.	(2.014)	(0.376)	(0.216)	(0.036)	(0.114)
P-value	(0.00)	(0.039)	(0.565)	(0.009)	(0.000)

$R^2 = 0.753$ $\quad \bar{R}^2 = 0.728$ $\quad$ F=30.513 $\quad$ D-W Statistics = 1.629

The above result shows there is 0.802 percent, 0.125 percent and 0.097 percent increase in the ratio of change in NFA to money supply are achieved for 1 percent increase in growth rate of real GDP, growth rate of price level and growth rate of interest rate respectively. Similarly, for 1 percentage increase in the ratio of change in domestic asset to money supply leads to 1.133 percentage decrease in the ratio of change in NFA to money supply. But, the result shows two macroeconomic variables, growth rate of real GDP and growth rate of interest rate are not significant, however, other two macroeconomic variables, growth rate of price level and the ratio of change in domestic asset to money supply are very significant.

4.3.1 Income ($\dot{Y}$)

The estimate regression equation estimated in this model shows that there is positive relationship between growth rate of real GDP and the ratio of change in NFA to money supply which supports the monetary approach to the balance of payments theory. Though, it holds the expected sign, the coefficient is statistically insignificant. Being statistically insignificant, we can say that the growth rate of real GDP is not responsible to the fluctuations in the ratio of change in NFA to money supply. So, in this respect we accept the Null Hypothesis that change in the real income does not have any influence on the ratio of change in NFA to money supply of the country. This might be because of the fact that from 2052 the insurgency began and ended in 2062 B.S. in the rural parts of the country which ultimately affect the entire country. Factory lockout, strike, vandalism, load-shedding, etc became a common problem of the country. The insurgency affects the rural parts much and the productive capacity of the country observed decreased considerably. The abduction of the youth for the militia purpose increased at the alarming stage and the youth of the rural as well as urban escaped into the foreign country for employment. Though, the earning of the nation keep on increasing from the remittances, the performance of the productive activities of the country declined. This means the monetary authority's account observed an increase in the quantity of the foreign reserves but the performance of the real sector was decreasing. The increase of volume of the foreign resources was greater than the decrease in production. Though the cumulative effect of the increased foreign reserve and the decreased real sector of the economy caused the national income increased, the level of income is found to be insignificant in

this study. Naturally, Nepalese economy is supply constant economy. And this characteristic reflects the indirect integration of the real sector to monetary sector. This may have caused the insignificance of the level of income in this study.

4.3.2 Domestic Price Level ($\dot{P}$)

The result suggest that the growth rate of the price has a positive impact on the ratio of change in NFA to money supply and this result supports the monetary approach to the balance of payments theory. The coefficient of this variable is 0.125 which indicates that 1 percent change in price level changes the ratio of change in NFA to money supply by 0.125 percent and it is statistically significant at 95 percent of confidence level (one tailed t- test). With this result we accept the alternate hypothesis that Change in domestic price level influences on the change in NFA in the country.

4.3.3 Interest Rate ($\dot{I}$)

The growth rate of domestic interest rate, in this regression equation seems to positive impact on the ratio of change in NFA to money supply. This result is in conformity with the assumption of the monetary approach to the balance of payments theory and in Nepal the impact of this variable is very minimal but it is statistically insignificant even at 10 percent level of confidence (one tail t-test). With this we accept the null hypothesis that changes in interest rate does not change the ratio of NFA to money supply.

4.4.4 The Ratio of Change in NDA to Money Supply (F*)

In the estimated regression equation this particular variable has the expected minus sign and the coefficient is not significantly different than one. This results indicates that there is equal and opposite relationship between the independent and dependent variable. The impact of this variable on the dependent variable is statistically significant even at 99 percent level of confidence (one tail t-test). It indicates that the relationship between these two variables is strong and significant and it supports the alternate hypothesis, which is the change in the net domestic credit changes the net foreign assets reserve in the country. The equal and opposite change in F* and C* is theoretically valid as money supply is compose of F and D. When one component increases the other must be decrease. The domestic credit creation is always backed up by the foreign assets reserves. So

theoretically and practically this is valid. The result strongly substantiates the assumption of MABP that excess supply of the domestic credit, given the demand for money will result in a loss of the international reserve.

4.4 Autocorrelation Test

Critical values of Durbin-Watson d-statistics for 0.01 level of significance when number of explanatory variables k'=4 and number of observations =45 are d_L=1.16 and d_U=1.53. The estimated Durbin-Watson d-statistics (=1.629) lies between d_U (=1.53) and 4 - d_U of the table. Thus, there is no first order autocorrelation, either positive or negative.

4.5 Heteroscedasticity Test

The white test is proceeded to test the heteroscedasticity for the model. The null hypothesis that there is no heteroscedasticity can be shown that sample size (n) times R^2 obtained from the auxiliary regression asymptotically follows the Chi-square distribution with df equal to the number of regressors excluding the constant term in the auxiliary regression. That is, $nR^2_{asy} \sim X^2_{df}$. In this model, there are 18 df since there are 18 regressors in the auxiliary regression and $nR^2 = 45 \times 0.753 = 33.885$ which is less than the critical value of Chi-square (=34.8053) at 0.01 significance level for 18 df. So there is no evidence of heteroscedasticity in the model.

4.6 Multicollinearity Test

The presence of multicollinearity can be tested with the help of Variance Inflating Factor (VIF). Table 3 gives VIF and 1/VIF for the explanatory variables in this study and are as:

Table 3: Result of VIF and 1/VIF

Variable	VIF	1/VIF
$\dot{Y}$	1.094	0.9140768
$\dot{P}$	1.434	0.6973501
$\dot{I}$	1.101	0.9082652
C*	1.313	0.7616146
Mean	1.236	

This result indicates that there is no evidence of multicollinerarity in the estimated model because VIF for the variables are less than 10 or the 1/VIF for the variables are greater than 0.1. Thus, there is no evidence for multicollinearity.

In conclusion, correlation matrix shows there is positive correlation of the ratio of change in NFA to money supply with growth rate of interest rate, and negative correlation with growth rate of real GDP, growth rate of price level and the ratio of change in domestic asset to money supply. The estimated regression equation shows that there is 0.802 percent, 0.125 percent and 0.097 percent increase in the ratio of change of NFA to money supply are achieved for 1 percent increase in growth rate of real GDP, growth rate of price level and growth rate of interest rate respectively. Similarly, for 1 percent increase in the ratio of change in domestic asset to money supply leads to 1.133 percent decrease in the ratio of change in NFA to money supply. However, the two macroeconomic variables, growth rate of price level and the ratio of change in domestic asset to money supply are only significant. There is no autocorrelation, no evidence of heteroscedasticity and no evidence for multicollenearity.

CHAPTER – FIVE

Summary, Conclusion and Recommendations

5.1 Summary

Today, no country remains in isolation from international community. Each country is following Ricardian comparative cost theory, the principle based on the difference in cost of production of similar goods in different countries and each country is specialized to produce such goods in which the comparative cost of production is least, and has got interdependence to other countries. This interdependence gives birth to the concepts of international trade and its development. Foreign assets reserve of a country plays a vital role in developing country like Nepal and is one of the major components for international trade. It affects the developmental activities on one hand and stability of economy on the other. Developing countries need foreign capital and other factors of production to conduct their developmental activities. A country cannot produce everything which needs and none of the countries are self sufficient. Thus to import necessary goods and services and for other transaction purpose a country should have enough reserve of foreign currencies.

Surplus or deficit in BOP arises from discrepancy between demand for and supply of foreign assets reserve of a country. The BOP is going to balanced if and only if demand for and supply of foreign assets of the country is equal. So, to maintain BOP balance, demand for and supply of foreign assets have to be kept in balance. This means, to have a stable BOP account, change in NFA of a country should be stable. Fluctuation in BOP of a country is directly related to the foreign assets holding. Fluctuation of NFA results into either a deficit or a surplus of BOP of a country. Surplus and deficit of the BOP of a country produce various economic as well as social troubles to any economy. Hence, fluctuation in it brings fluctuation in the money supply and ultimately on macroeconomic activities of a nation. So, stability in the BOP of a country is always desirable however it is rarely attainable.

There are three distinct approaches to study the BOP problems. They are the elasticity approach, the absorption approach and the monetary approach. The first two approaches that is the elasticity and the absorption approach are generally understood as traditional approach. The monetary approach which is the outcome of contribution of experts of the International Monetary Fund, H. G. Johnson, Robert A. Mundell and others is known as modern approach in BOP Study.

The elasticity approach is based on Marshallian tradition of treating exchange rate as a relative price that clears with well-defined flow of demand and supply curves. This approach studies BOP through the current account. According to this approach, disequilibrium in BOP is due to different price situation prevailing in different countries. According to this theory, to correct the disequilibrium in BOP is to divert the prices into the right direction. Hence, elasticity approach is the theory that studies disequilibrium in current account balance through different prices in different countries and corrects BOP disequilibrium with the help of price change. Therefore, the elasticity approach considers the responsiveness of imports and exports to a change in the value in the nation's currency.

The absorption approach developed by S.S. Alexander came into existence as a reaction against the elasticity approach. According to this approach, discrepancy in BOP is due to over consumption or under consumption of the people of domestic resident. The theory simply states that a country has a deficit BOP when people are absorbing more than they produce i.e. domestic expenditure on consumption and investment is greater than national income. Similarly, a country has a surplus BOP when the people are absorbing less than they produce i.e. domestic expenditure on consumption and investment is less than national income. So, whether the current account improves or deteriorates depends on relative change on domestic income and domestic expenditure.

The monetary approach regards BOP as a monetary phenomenon and surplus or deficit in BOP is due to disequilibrium in the money market. Deficit is caused by money supply exceeding money demand, while surplus is caused by money demand exceeding money supply. The monetary approach, therefore, largely, emphasizes the monetary implications

of BOP disequilibria. The monetary approach assumes money supply plays a vital role in BOP which can be controlled by altering cash balances of the people. So, if money supply is in control, whole problem is solved. In a modern banking system, the structure of money supply is a sum of NFA and net credit creation. And, in open economy, the monetary authority cannot control NFA because people can demand and sell foreign assets as they wish. However, the monetary authority has full control on credit creation and has control over part of the money supply. In this way, the monetary approach to balance of payments takes domestic credit as the only policy variable.

The data of last 45 years from fiscal year 1964/65 to 2009/10 reveal that NFA of monetary authority of Nepal has been fluctuating widely. The growth rate of NFA has not been stable as well as not always positive in the past. This indicates that Nepal is suffering from BOP problem. This study endeavors to find out the policy variables that can be used to correct BOP problem of Nepal.

Considering the economic realities, circumstances and other historical factors of Nepal, monetary approach has been used to study and analyze BOP problem of Nepal. This approach has become the best tool to study BOP problem in the least developed countries and developing countries. Due to the poor data recording system of developing countries, it is not possible to study BOP problem by using either elasticity approach or the absorption approach. The data itself becomes a great problem in developing countries. So, the study of BOP in these countries can be easily carried out by using monetary approach.

The main objective of this study is to find whether the monetary variables that is income, price, interest and domestic credit are responsible to produce fluctuations in BOP of Nepal or not. To achieve this objective, the study adopts the method developed by Johnson small country model. This study applies econometric tools like OLS technique for time series data.

The monetary approach to BOP theory states that there is positive impact of real income and price level and negative impact of interest rate and net domestic credit creation on the

NFA. The result derived from the empirical study shows only three macroeconomic variables- real GDP, price level and domestic credit are consistent with the theory. The relationship of interest rate with foreign asset reserve shows inconsistent result in Nepalese context and contradicts with the monetary theory. Only two macroeconomic variables in the model, price level and net domestic credit have satisfactory level of significance. The variable net credit creation has a very high numerical coefficient which implies it affects very much for changing NFA thus can be regarded as policy variable.

The real GDP which is taken as a proxy for income shows significant impact on the change in NFA of Nepal. The impact of the income on change in NFA in term of change in the ratio of change in NFA to money supply indicates that 1 percent increase in the growth rate of real GDP leads to 0.802 percent increase in the ratio of change in NFA to money supply of Nepal. This is to say, the BOP problem can be corrected effectively and efficiently by increasing the level of income of the people. The significance level of this relationship in the model is not satisfactory but the direction of relationship is consistent with the theory.

The domestic price level has a significant positive impact on the NFA of Nepal. The coefficient of price level is high and significant. This result indicates that 1 percent increase in the growth rate of price level leads to 0.125 percent increase in the ratio of change in NFA to money supply. Fluctuations in price level fluctuate to the NFA of Nepal. That is why price is also considered one of the efficient policy variables to solve the BOP problem of Nepal.

The influence of domestic interest rate on NFA is found inconsistent and statistically insignificant result in this study. The result indicates that 1 percent increase in the growth rate of interest rate leads to 0.097 percent increase in the ratio of change in NFA to money supply. The variable produces a very weak and minimal effect on the NFA holdings. The small coefficient of the variable may be because of the fact that large of people are still out of formal banking system in Nepal.

The domestic credit creation is found statistically very significant and consistent to influence the NFA as it has the significant and higher numerical coefficient. The result indicates that 1 percent increase in the ratio of change in domestic asset to money supply leads to 1.133 percent decrease in the ratio of change in NFA to money supply. The result suggests that credit creation or destruction plays the most important role in the fluctuation of NFA holdings of Nepal. The monetary authority of Nepal can control the magnitude and direction of BOP by controlling this measure. It is the most important tool to control foreign assets of Nepal. In other words, to solve the BOP problem of Nepal, the domestic credit creation is a very appropriate policy variable.

5.2 Conclusion

From this study, it is concluded that desired change NFA and BOP of Nepal can be achieved by managing supply and demand for money efficiently. There are many macroeconomic variables that determine supply and demand for money out of which real GDP, price level, interest rate and net domestic asset are considered as major influencing macroeconomic variables for NFA and BOP of the country.

For the analysis, these macroeconomic variables are converted into their growth rates and change in ratios respectively. A fundamental equation with the ratio of change in NFA to money supply as dependent variable and other macroeconomic variables such as growth rate of real GDP, growth rate of price level, growth rate of interest rate and the ratio of change in domestic asset to money supply are considered as independent variables.

The result obtained from regression analysis shows that 1 percent increase in the growth rate of real GDP leads to 0.802 percent increase in the ratio of change in NFA to money supply. Similarly, 1 percent increase in the growth rate of price level leads to 0.125 percent increase in the ratio of change in NFA to money supply, 1 percent increase in the growth rate of interest rate leads to 0.097 percent increase in the ratio of change in NFA to money supply and 1 percent increase in the ratio of change in domestic asset to money supply leads to 1.133 percent decrease in the ratio of change in NFA to money supply. However, two macroeconomic variables such as growth rate of real GDP and growth rate

of interest rate, are not significant, but, other two macroeconomic variables, growth rate of price level and the ratio of change in domestic asset to money supply, are very significant in the study.

In conclusion, there are many macroeconomic variables that determine supply of and demand for money out of which net domestic asset is the one which have strong and significant impact on the change in the NFA and thus can be regard as the main policy variable.

5.3 Recommendations

With the help of the empirical findings of this study, it can be recommended that there are several economic variables that have significant and strong impact on the change in NFA of Nepal. If these economic variables are left free, they can make far reaching adverse impact on the NFA of the country. Therefore, for efficient management of foreign assets reserve and to achieve stable and favorable BOP position following measures are recommended:

1. The monetary approach to balance of payment is an appropriate tool to study BOP problem of Nepal. And, at present, to solve the BOP problem of Nepal effectively, the monetary measures should be applied.
2. The domestic credit which is very much influential among the four variables exerts negative impact on the NFA of the country. Thus, domestic credit must be taken as the policy variable and controlled to correct BOP of Nepal.
3. The price level which is also influential variable exerts positive impact on the NFA of the country. Price should be taken as policy variable to correct the BOP problem. However, in small country like Nepal, it is exogenously determined.
4. The income variable and interest should not be given importance as policy variables to correct the BOP as these variables are not significant in this study.

This study has considers only four macroeconomic variables such as income, price, interest and domestic credit. Additional study should be performed in future including more variables as well as further econometric models and econometric test.

Appendix: A

Table 4 : The Data Series Used in the Regression Model

FY	F	C	Y	P	I
1964/65	381.40	23.90	10541.23	7.78	3.50
1965/66	449.50	40.20	11283.12	7.89	3.50
1966/67	367.40	135.30	11105.94	8.09	3.50
1967/68	408.50	127.10	11181.13	8.25	3.50
1968/69	660.60	66.50	11677.80	8.26	6.00
1969/70	894.30	-37.10	12036.09	8.60	6.00
1970/71	1007.20	-31.90	11838.24	9.51	6.00
1971/72	1047.60	24.50	12207.00	9.97	6.00
1972/73	1179.10	82.70	12147.76	10.08	6.00
1973/74	1383.00	146.20	12918.18	11.20	6.00
1974/75	1451.50	459.50	13106.18	13.30	15.00
1975/76	1029.10	1035.30	13609.42	15.50	14.00
1976/77	1575.00	949.00	13838.93	15.40	12.00
1977/78	1875.20	1347.80	14288.61	15.80	12.00
1978/79	1783.30	1988.80	14524.04	17.60	12.00
1979/80	2288.00	2223.40	14573.39	18.20	12.00
1980/81	2231.90	3053.40	15874.74	19.90	12.00
1981/82	2414.50	3893.20	16644.07	22.60	12.00
1982/83	3097.40	4360.60	16820.40	25.00	12.50
1983/84	2611.50	6611.00	18299.18	28.50	12.50
1984/85	2539.80	7915.40	19552.87	30.30	13.00
1985/86	1897.60	10399.00	20483.77	31.50	13.00
1986/87	2600.00	12559.00	20915.20	36.50	12.50
1987/88	3059.90	14438.00	22390.30	41.40	12.50
1988/89	5573.60	15849.00	23597.90	45.90	12.50
1989/90	6203.50	20402.00	24749.10	49.70	12.50
1990/91	9338.90	22214.00	26395.50	54.50	11.50
1991/92	16151.70	21561.00	27687.50	59.80	11.80
1992/93	20792.40	24878.00	28644.90	72.40	12.00
1993/94	29125.00	29198.00	30911.50	78.80	12.00
1994/95	36218.10	33559.00	31840.70	85.90	8.80
1995/96	37085.50	43899.00	33668.10	92.20	8.80
1996/97	37703.60	54949.00	35385.60	100.00	10.30
1997/98	40191.10	63530.00	36559.20	108.10	10.30
1998/99	55572.80	70890.00	38234.80	117.10	9.80
1999/00	65027.60	87773.00	40574.60	130.40	8.40
2000/01	80467.50	105653.00	41342.80	134.80	6.90
2001/02	87798.10	126656.00	41409.20	138.10	6.10
2002/03	88419.10	135569.00	42969.90	142.10	5.30
2003/04	91407.00	154504.00	44865.40	148.90	5.00
2004/05	108804.70	168505.00	46316.50	154.80	4.30
2005/06	107742.10	192698.00	48043.50	161.80	3.65
2006/07	139439.20	207385.00	49365.10	174.70	3.65
2007/08	131909.50	263609.00	52226.00	185.90	3.65
2008/09	171455.50	323922.00	54196.40	200.20	4.25
2009/10	221083.70	411661.70	56348.80	226.70	5.75

Source: 1. Quarterly Economic Bulletin (Various Issues), Nepal Rastra Bank and;
2. Economic Survey (Various issues), Ministry of Finance, Nepal Government.

Note: 1. NFA, Net Foreign Assets, is in Rs. Million 2. Y, Real GDP, is in Rs. ten Million at 2000/01 Price 3. Price Level, is Nepalese CPI Basket (1995/96=100) 4. I, Interest Rate, one year fixed deposit rate of commercial banks 5. C, Net domestic credit, is in Rs. Million.

Appendix: B

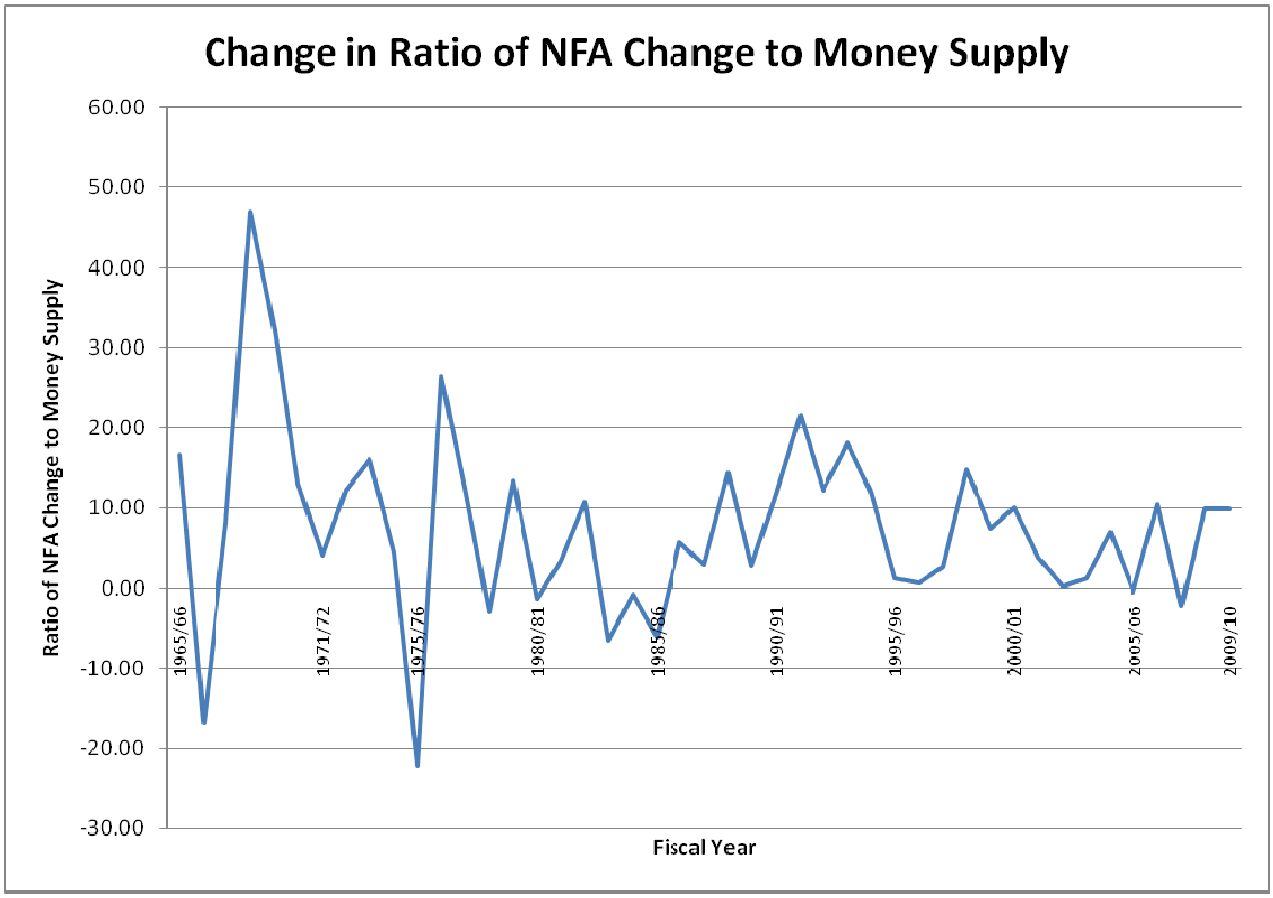
Table 5: The Data Series in Growth Rate and Ratio Variables

FY	F*	C*	$\dot{Y}$	$\dot{P}$	$\dot{I}$
1965/66	16.8024	4.0217	7.0380	1.4139	0.0000
1966/67	-16.7654	19.4201	-1.5704	2.5349	0.0000
1967/68	8.1759	-1.6312	0.6770	1.9778	0.0000
1968/69	47.0687	-11.3144	4.4421	0.1212	71.4286
1969/70	32.1414	-14.2484	3.0681	4.1162	0.0000
1970/71	13.1708	0.6066	-1.6438	10.5814	0.0000
1971/72	4.1423	5.7828	3.1150	4.8370	0.0000
1972/73	12.2656	5.4286	-0.4853	1.1033	0.0000
1973/74	16.1595	5.0325	6.3421	11.1111	0.0000
1974/75	4.4795	20.4878	1.4553	18.7500	150.0000
1975/76	-22.1036	30.1308	3.8397	16.5414	-6.6667
1976/77	26.4435	-4.1804	1.6864	-0.6452	-14.2857
1977/78	11.8938	15.8003	3.2494	2.5974	0.0000
1978/79	-2.8514	19.8883	1.6477	11.3924	0.0000
1979/80	13.3798	6.2193	0.3398	3.4091	0.0000
1980/81	-1.2435	18.3978	8.9296	9.3407	0.0000
1981/82	3.4549	15.8894	4.8463	13.5678	0.0000
1982/83	10.8265	7.4100	1.0594	10.6195	4.1667
1983/84	-6.5152	30.1743	8.7916	14.0000	0.0000
1984/85	-0.7774	14.1437	6.8511	6.3158	4.0000
1985/86	-6.1424	23.7547	4.7609	3.9604	0.0000
1986/87	5.7121	17.5658	2.1062	15.8730	-3.8462
1987/88	3.0338	12.3953	7.0528	13.4247	0.0000
1988/89	14.3657	8.0638	5.3934	10.8696	0.0000
1989/90	2.9404	21.2533	4.8784	8.2789	0.0000
1990/91	11.7848	6.8106	6.6524	9.6579	-8.0000
1991/92	21.5917	-2.0695	4.8948	9.7248	2.6087
1992/93	12.3054	8.7954	3.4579	21.0702	1.6949
1993/94	18.2451	9.4591	7.9128	8.8398	0.0000
1994/95	12.1618	7.4773	3.0060	9.0102	-26.6667
1995/96	1.2431	14.8186	5.7392	7.3341	0.0000
1996/97	0.7632	13.6446	5.1013	8.4599	17.0455
1997/98	2.6848	9.2615	3.3166	8.1000	0.0000
1998/99	14.8299	7.0960	4.5833	8.3256	-4.8544
1999/00	7.4763	13.3502	6.1196	11.3578	-14.2857
2000/01	10.1046	11.7015	1.8933	3.3742	-17.8571
2001/02	3.9386	11.2846	0.1606	2.4481	-11.5942
2002/03	0.2896	4.1561	3.7690	2.8965	-13.1148
2003/04	1.3340	8.4536	4.4112	4.7854	-5.6604
2004/05	7.0748	5.6935	3.2343	3.9624	-14.0000
2005/06	-0.3832	8.7242	3.7287	4.5220	-15.1163
2006/07	10.5502	4.8885	2.7508	7.9728	0.0000
2007/08	-2.1710	16.2111	5.7954	6.4110	0.0000
2008/09	9.9985	15.2491	3.7728	7.6923	16.4384
2009/10	10.0183	17.7117	3.9715	13.2368	35.2941

This table is derived from table 4.

Appendix: C

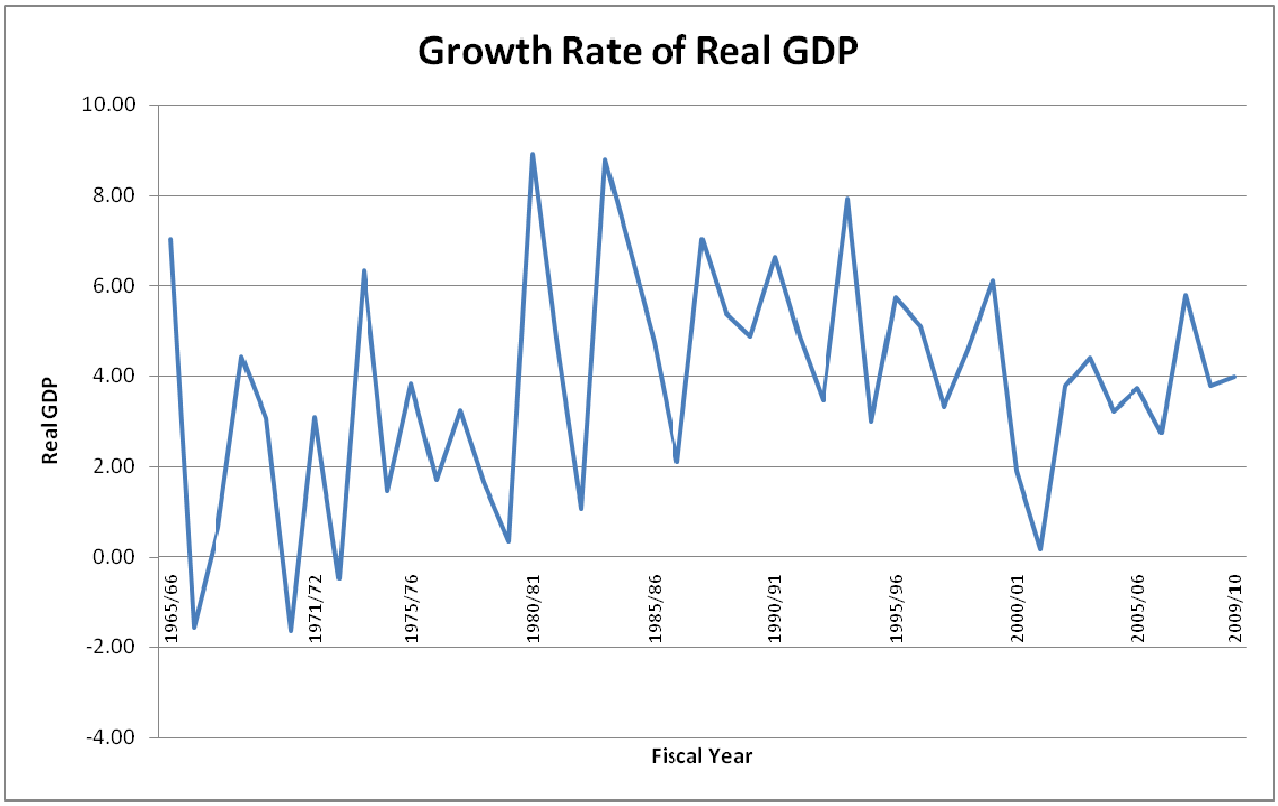
Figure 1: Change in Ratio of NFA Change to Money Supply



Source: Appendix B

Appendix: D

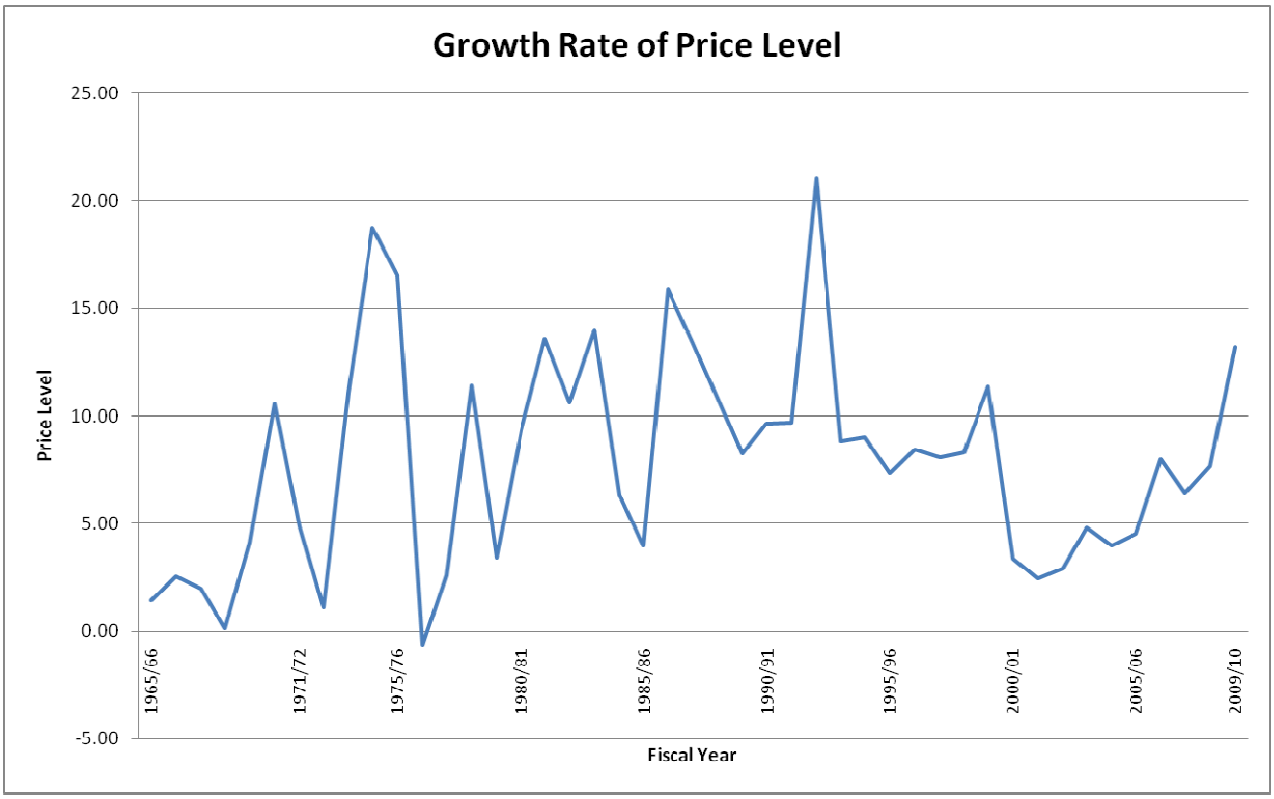
Figure 2: Growth Rate of Real GDP



Source: Appendix B

Appendix: E

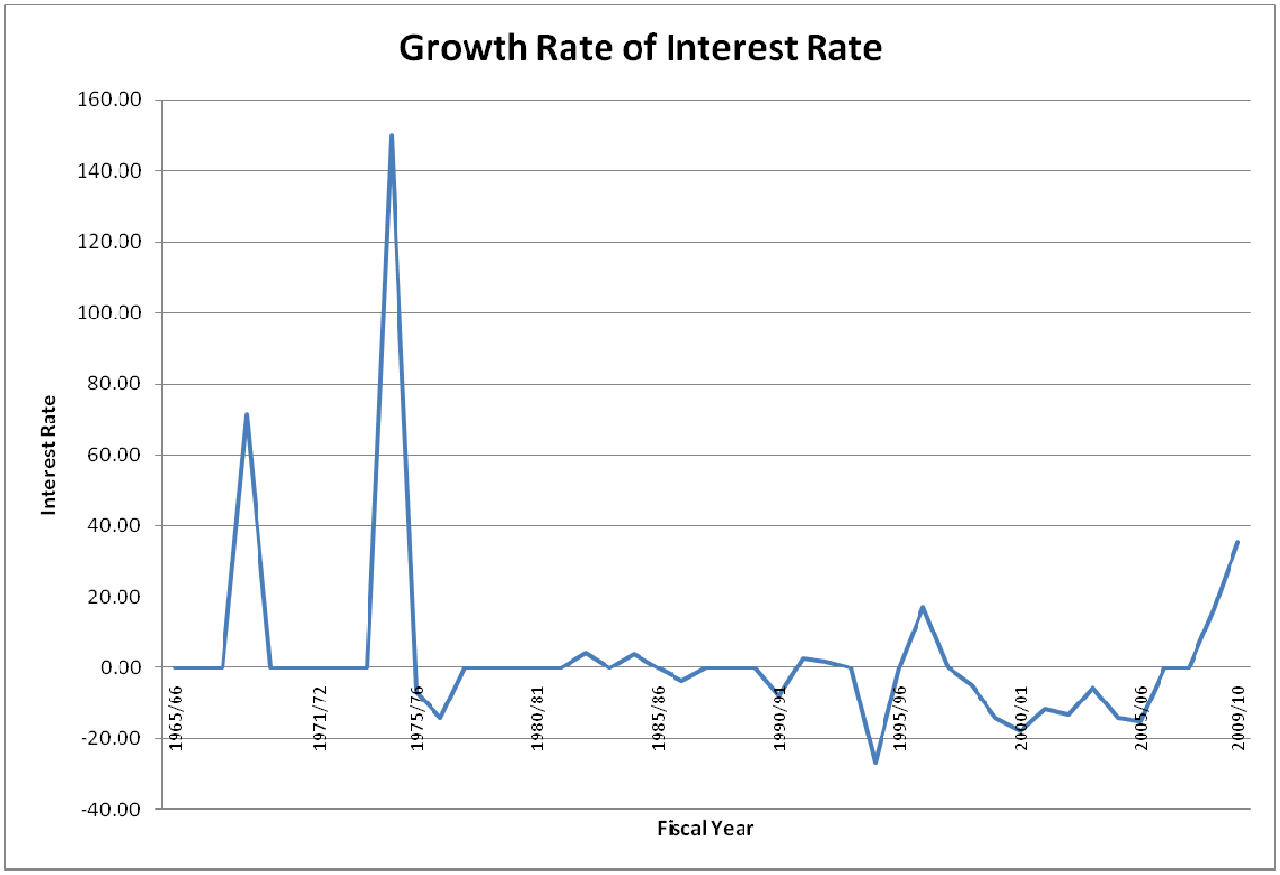
Figure 3: Growth Rate of Price Level



Source: Appendix B

Appendix: F

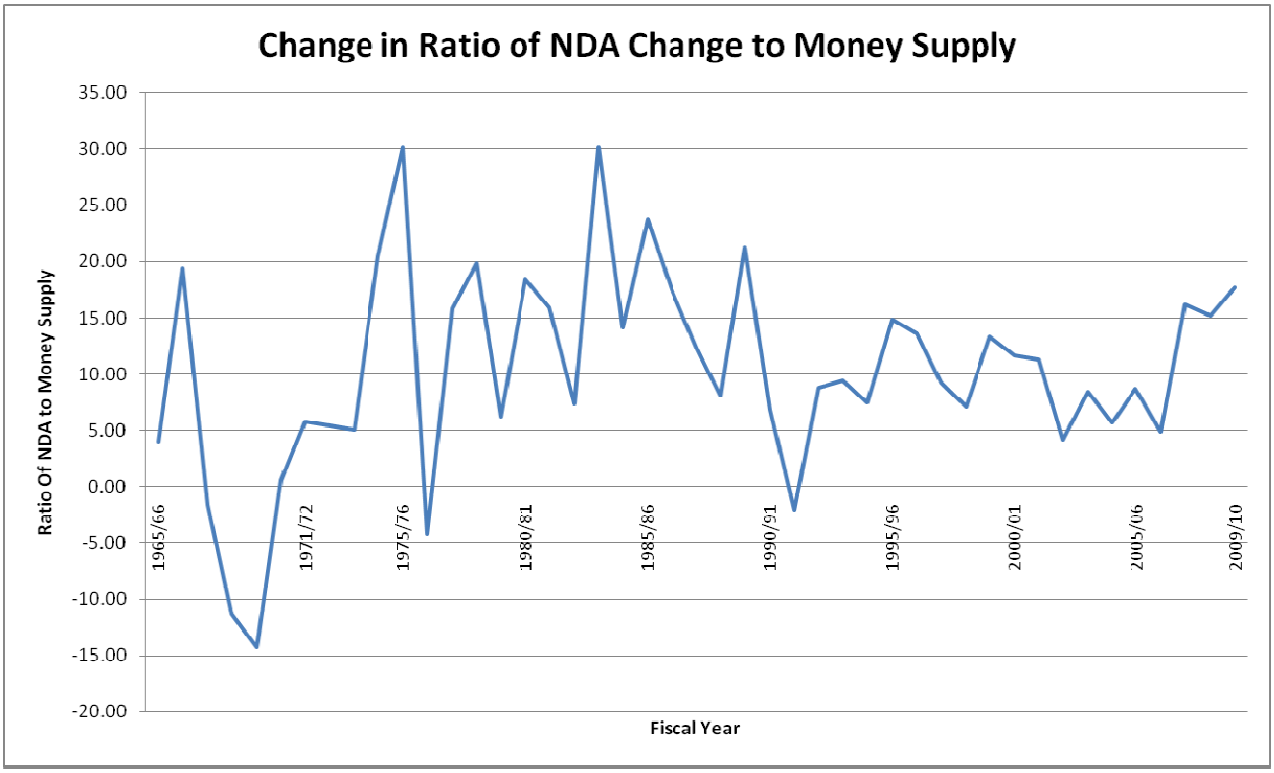
Figure 4: Growth Rate of Interest Rate



Source: Appendix B

Appendix: G

Figure 5: The Change in NDA Change to Money Supply



Source: Appendix B

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