CHAPTER I
INTRODUCTION

1.1. Background of the Study

Public expenditure refers to the expenditure made by public authorities i.e. central government and other local bodies to carter the demand of the people. It is for protecting the citizens and for promoting their economic and social welfare. Public expenditure is one of the instruments through which government influence economic events. Public expenditure to carry out essential functions of administrating justice and providing national defense and to supply certain additional goods and services that is advantageous to a great society but that would not be supplied by private enterprises because doing so would not be profitable (Goode, 1984).

Moreover, most of the government is spending money in the economy in the different sector. Basically, it is divided in to two categories that are current expenditure and development expenditure. Current expenditure is the regular government expenditure that is useful to run the day to day administration of the country. The development expenditure is one that is useful for the infrastructure building, providing different services in the education, health, agriculture etc. And, public expenditure is an important instrument of the state policy to make control over the economy of the state (Sharma, 1999).

Basically, there are two Predominant and opposing views about the government intervention in the economy that are Classical View and Keynesian View. Keynesian argues that government expenditure is an important policy tool to be used to ensure a reasonable level of economic activity and correct short term cyclical fluctuations in aggregate expenditure (Singh&Shani, 1984). It helps to increase in productive investment, thus providing a socially, Optimal direction for growth and development (Ram, 1986). On the other hand, Classical View argues that excessive state intervention in economic life affects growth performance in a negative way for two reasons: first, because government operations are often conducted less efficiently, they reduce the overall Productivity of the economic system; second, because excessive government expenditure distorts economic incentives and results in suboptimal economic decisions (Barro, 1990).

1.2. Statement of the Problem

For the few years, public expenditure of Nepal is continuously rising due to the surplus budget. What are the reasons for the increase in the public expenditure of Nepal? Except the classical and new classical theories, most of the economic policies argue that the increase in the government expenditure will increase the output by the multiplier process. But in case of Nepal, despite the high increase in the expenditure of government the growth rate of the country is not exceeding more than 5%; what are the causes for this? In spite of this the expenditure of the government on the health and education is surprisingly high and according to the growth theory by the Barro and s-martin; expenditure on development on the human capital formation will increase the growth rate in long run. But, the economic growth rate of Nepal has been fluctuating around 3% over the decade. So, what is the relationship between the economic growth and public expenditure in Nepal? Whether they have positive or negative or no relationship between them? If Nepal wants to achieve desired economic growth should it increase or decrease the public expenditure. Thus, this thesis tries to answer the following research questions:

i) What is the nature and trend of the public expenditure and economic growth in Nepal?
ii) Is there any relationship between the public expenditure and economic growth in Nepal?
iii) Is there any Causal relationship between the public expenditure and growth in Nepal?

1.3. Objectives of the Study

The general objective of this thesis is to analyze the relationship between the Public expenditure and economic growth in Nepal.

i. To examine the nature and trend of the public expenditure and economic growth in Nepal.
ii. To analyze the long run and short run relationship between public expenditure and economic growth in Nepal.
iii. To analyze the Causal relationship between the public expenditure and economic growth in Nepal.

1.4. Hypothesis of the Study

Thehypothesis of the study is as below:

Null Hypothesis (H_0): There is no significant relationship between the public expenditure and economic growth.

Alternative Hypothesis (H_1): There is significant relationship between the public expenditure and economic growth.

1.5. Significance of the Study

The research area basically focuses on the Nepalese economy. The government expenditure is divided in to several headings mainly to the two headings; recurrent expenditure and the capital expenditure; whenever it is necessary.

There are various research works done on the topic of the public expenditure and its trend in Nepal together with the GDP growth of the economy. But, there are very few that talks with the relationship between the GDP growth and the public expenditure. Moreover, no one paper checked the casual relationship between the GDP growth and public expenditure and not any research was conducted that has find out the determinants of the public expenditure and economic growth in case of Nepal. So, from this thesis government will get information whether to increase or decrease the public expenditure to achieve the higher economic growth. Thus, this paper helps the government to decide the exact amount of the public expenditure required to achieve the desired economic growth rate. For, the academicians it helps to develop the new hypothesis and check the existing hypothesizes and theories; thereby it helps to develop the new theories. Since this paper provides framework to the government to make the investment decisions in different sectors. It helps to policy makers form different sectors such as education, health, defense to set out their goals, plans and strategies. Similarly, Private sector can use it to decide where and how much to invest to achieve the higher profit.

1.6. Limitations of the Study

Government Expenditure in Nepal can be found only in the secondary data sets and I should rely on the secondary data set. I cannot test the reliability of the data. Another limitation is the availability of the insufficient data sets. I will use time series

analysis. So, the higher number of observation is useful but we have hardly 38 years' data set. And, these 38 years is also divided in different characteristic of the government like *panchayat* regime and democratic government; that significantly determine the government expenditure. Such as, before the restoration of the democracy we have data for only around 15 years which is not enough for the time series. And, same problem relies on the time of the insurgency and peace process era. Moreover, it only dwelt with the supply side of the government expenditure but not of the demand side of the government.

1.7. Organization of the Study

The first chapter of the study will be introduction including general background, statement of the problem, objectives of the study, hypothesis of the study, significance of the study and limitation of the of the study. The second chapter of the study will be review of the literature including both theoretical concepts, international context and national context. Third chapter will be the research methodology with the framework of research, research design and various econometric models and tests. Fourth chapter will be the data presentation and analysis of the study. Finally, the fifth chapter will be the Summary, conclusion and recommendation.

CHAPTER II
REVIEW OF LITERATURE

2.1. Theoretical Concept

There are so many theories on public expenditure. Classical economists gave less attention on public expenditure on economy. They gave narrow view that the government should not make interfere in the general activities. They advocated the laissez-fair policy. They suggested that government should reduce their expenditure, they believed on the existence of the full employment in the economy and there is no need of government intervention.

But later, after the Great Depression of 1930's, many economists suggested that the government must intervene in the economy. A moderate level of government intervention is necessary to run the economy smoothly. Hence, the analysis of public expenditure in different time period and theories are examined. That can be divided in to the classical view, Keynesian view, Neo-classical growth model, Endogenous growth model, Peacock and Wiseman hypothesis, Colin Clark hypothesis, Baumol's hypothesis, and Stanly Please hypothesis.

2.1.1. Classical View on Public Expenditure

Classical economists were opposed to the role government in the economy. They were the supporter of the laissez fair economy. They had strong argument against the government intervention in the economy and thus in the public expenditure. Hence, they do not believe that the government expenditure can bring economic growth instead they believe that government expenditure has negative impact on the economy. According to classist government intervention creates nothing but disturbances on automatic mechanism of market economy. Classical economists took government expenditure and revenue programs as "necessary evils" (Romanus, 2014); necessary in the sense that certain function of the economy must be done by government and evil in the sense that government activity disturbs market mechanism. Thus, they emphasized in 'less government role'. They argued in favor of balance budget. In fully employed situation, if government increases public expenditure without increasing its revenues, this will lead to inflation. The classical

view on government borrowing is that the expenditure should make on productive purposes. It is necessary for the state to borrow, and then this borrowing must be confined to the financing of productive enterprises. Otherwise, borrowing will be meaningful if it is used in productive sectors.

A debt of the government generally represents an opportunity that has been wasted. Hence, the government should try to repay its debt as early as possible. The interest on public expenditure followed downward trend till the advent of Keynesianism. This trend was the outcome of highly normative orientation of public finance which concern with the concept of equity in taxation based on voluntary exchange theory rather than the development of substantial positive hypothesis. Besides, it was a general opinion that the level and structure of public expenditure is determined politically and thus it is beyond the economist's proper orbit of the study (Weber, 1947).

For the classical economist, the main task of public finance was simply to allocate the burden of taxes as fairly as possible among the member of the community. In conclusion, classical economist's views to restrain government interference in the private sector because public sector was fear of corruption. The position of classical economists can be epitomized as "the less government, the better" (Weber, 1947).

2.1.2 Keynesian View on Public Expenditure

Keynes (1936) has opposed the idea of classical theory in the sense that the classical notion of full employment equilibrium through wage-price flexibility is a rare and special case. He argued that the idea that wages and prices are sticky to downward due to the presence of trade union and the other factors in the economy. Also, he said that employment depends upon effective demand and there might not be adequate demand to generate full employment every time. Decrease in effective demand causes unemployment in the economy. The aggregate demand goes up at the time of the inflation. Thus, at this condition the government should cut consumption by the reduction in its own expenditure and increase tax rate. Hence, it is better to have surplus budget at the time of the inflation. On the other hand, during the depression, there is decrease in the effective demand. Hence, the government should increase its expenditure and spend more on public works. In this way, additional resources can

be employed. Thus, in the period of depression it is better to have a deficit budget to increase the consumption.

2.1.3. Role of Public expenditure in the Neo-Classical Growth Theory

The discussion of the modern growth theories is always based on the Solow's growth accounting approach. According to the Solow (1956) the economic growth in the long run basically depends upon the increase in the population growth and the technological progress. According to the Solow (1956) and Swan (1956) the accumulation of the capital is the only way to increase the growth when there is less development in the technology (Petrakos, et. al., 2007).

The most basic proposition of growth theory is that in to sustain a positive growth rate of output per capita in the long run, there must be continual advances in technological knowledge in the form of new goods, new markets, or new processes, which was demonstrated by the neoclassical growth model which shows that if there were no technological progress, then the effects of diminishing returns would eventually cause economic growth to cease (Aghion and Howitt, 1998). Public Policies in general and public expenditures specifically, do not affect growth. In the extended Solow model, however, human capital is an important input to growth (Mankiw et.al., 1992).

2.1.4. Role of Government Expenditure in the Endogenous Growth Model

In the endogenous models, public policies can affect both human capital formation and technological progress and therefore public policies can also influence economic growth. Endogenous growth models such as those of King and Rebelo (1990), on the other hand, predict that distortionary taxation and productive expenditures do not affect the long –run growth rate. The implications of endogenous growth models for fiscal policy have been particularly examined by Barro (1990), Jones et.al. (1993), Stokey and Rebelo (1995) and Mendoza et.al. (1997). In testing whether the historical evidence supports the neoclassical or the endogenous growth model, several major difficulties arise. One is that there may be only limited data on government expenditure and revenues, particularly at the required level of disaggregation, and the definition of expenditure as productive or unproductive, or taxes as distortionary or non- distortionary (Bleaney et.al.,2000)

Recent literature on endogenous growth theory predicts that fiscal policy changes can affect the long-term growth rate by influencing the determinants of growth (Physical and human capital, technological changes, employment and savings) (Hjerppe et. al., 2006). As to the government expenditure, public education and health expenditure are two of the most important public expenditure items which can contribute to the formation of the human capital; and consequently, there is in principle, a channel from government expenditure to economic growth. Changes in Public expenditures and taxes could boost (or depress) employment and human capital accumulation and change investment externalities that then would have effects on growth rate of output. This contrasts with the basic neoclassical growth model, where fiscal policy is unable to affect the long –term growth.

2.1.5. Peacock and Wiseman Hypothesis

This study is assumed to be one of the best-known analyses of the time pattern of public expenditure. The main argument is that public expenditure does not increase in a smooth and continuous manner, but in jerks or Step-like fashion. The analysis was founded on the political theory of public expenditure determination, 'that governments like to spend more money, that citizens do not like to pay more taxes, and that governments need to pay some attention to the wishes of their citizens'. Peacock and Wiseman opened the analysis that public expenditure is to be influenced at the ballot box (Peacock& Wiseman, 1961).

Musgrave (1969) and Rostow (1971) have done study about the public expenditure and found that in the early stages of economic growth and development, public sector investment as a proportion of the total investment of the economy is very high. At this level, the public sector provides social infrastructure, such as roads, transportation systems, sanitation systems, law and order, health and education and investment in human capital. The public sector is necessary to gear up the economy for take-off into middle stages of economic and social development. In the middle stages of growth, the government continues to supply investment goods but complementing the private sector investment. Musgrave argues that over the development period, as the total investment-GDP ratio rises, the relative share of public sector investment falls. Rostow claims that when the economy reaches the maturity stage, the mix of public expenditures will shift from infrastructures to

increasing expenditures on education, health and welfare services. At the stage of high mass consumption, income maintenance programs and policies are designed to redistribute welfare, which will grow significantly relative to other public expenditures and relative to GDP.

2.1.6. Colin Clark Hypothesis

It is also called the "Central limit hypothesis". Clark uses on the interwar data of several western countries and argued that inflation inevitably occurs when government expenditure financed out of taxes and other receipts twenty-five percent of aggregate national income. To support this statement, Colin argues that when the government share of aggregate economic activity reaches the critical limit of twenty-five percent, the income earners are also affected by reduced incentives due to high tax incidence that their productivity suffers. Clark's analysis of the relation between public expenditure and inflation is only partial. Inflation so far as it brought about spending, relates to the equilibrium situation between supply and demand for scarce resources i.e. between the capacity output of the economy and the aggregate spending for such output (Musgrave& Musgrave, 1979).

2.1.7. Baumol's Hypothesis

The productivity lag hypothesis was developed by Baumol (1984). Sometimes it is also called "Baumol's Disease". It is based on productivity differentials of private and public sector. When the economy is not automatically stabilized, then expansion in public expenditure is made. Baumol has given two causes that create "Productivity-Lag". Technical barriers opposing innovation in the public sector are higher than in the private sectors. Institutional barriers are greater in public sector in comparisons to the private sector (Musgrave & Musgrave, 1979).

2.1.8. Stanley Please Hypothesis

Stanley please Hypothesis deals with the cause and sources of increasing government expenditure in least developed countries with its effectiveness and overall impact on economy. According to Stanley please public expenditure especially for consumption is driven by available resources rather than the other way around. His question is, is increasing government saving by taxation is national

saving. But increasing in tax rate that implies to more: such expenditure is not only increased in investment but also increased in government consumption. So, please effect is relevant in developing countries. He suggested some policies in expenditure management which are as follows: government should be more rational and more self-disciplined in determining public expenditure policy. Expenditure on current activates and alternatives uses of revenue should be calculated. Spending on education and health is taken as both current expenditure and capital expenditure as it provided benefit to the country after a lag of many years. In case of foreign loan, the productivity that it yields and the liability that the country must pay later should be calculated and must be used in the beneficial project (Musgrave & Musgrave, 1979).

2.1.9. Rahn Curve

Most of the economist agree that there are certain works and duties that must be provided by the government. This is because there are certain sectors for example national defense, infrastructure and court that can be better handled only by the government sector. This means there should be certain level of government expenditure in the economy. On the other hand, higher amount of the government expenditure can have the negative impact on the economy through the negative externality in the private expenditure and the due to the crowding out effect. Both discourages the private sector investment and reduces the efficiency of the economy. Thus, Per the Rahn Curve 20% of the Public expenditure of the GDP is taken as the optimum level of the public expenditure.

2.2. International Context

Desmond and et.al (2012) have analyzed effects of the public expenditure on the economic growth of Nigeria. The objectives of the research are to carry out the relationship of the public expenditure and economic growth in Nigeria and to find out the causal relationship between them. The research has applied OLS multiple regression models specified on Perceived causal relationship between government expenditure and economic growth. It used time series data included in the model were those on gross domestic product (GDP), and various components of government expenditure. Results of the analysis showed that capital and recurrent

expenditure on Economic services had insignificant negative effect on economic growth during the study Period. Also, capital expenditure on transfers had insignificant positive effect on growth. But, Capital and recurrent expenditures on social and community services and recurrent expenditure on transfers had significant positive effect on economic growth.

Kweka and Morrissey (2000) have studied the relationship between the government spending and economic growth in Tanzania. The objective of this paper is to investigate the impact of public expenditure on economic growth of Tanzania. The research has used the time series data set in between 1965-1996. It formulated the model by disaggregating the government expenditure on physical investment, consumption expenditure and human capital investment. Results of the research showed that the negative relationship between the physical investment and growth accounting in Tanzania. On the other hand, consumption expenditure has positive effect on the growth and the expenditure on the human capital is not insignificant in the study.

Alshahrani and Alsadiq (2014) an IMF working paper examined the relationship between the economic growth and government spending in Saudi Arabia. The main objective of the paper is to find out the effect of the total as well as sectoral government expenditure in total production of the country and hence in the economic growth of the country. It used ADF technique to check whether the data set is stationary or not. After this it employed Johanson cointegration technique to see the long run relationship and used VECM to check the short run relationship between the variables. It employed annual data over the period 1969-2010. Findings of the papers indicated that private domestic and public investments, as well as healthcare expenditure, stimulate growth in the long-run, openness to trade and spending in the housing sector can also boost short-run production.

Alexiou (2009) has tried to explore the effect of the government spending on the economic growth of the South-Eastern Europe. The primary objective of the paper is to empirically evaluate the impact of government expenditure on economic growth for transition economies in south Eastern Europe. Two different panel data methodologies have been applied to seven transition economies in the South-Eastern Europe (SEE). This paper tested the effects of the 5 different variables on the

economic growth that are government spending on capital formation, development assistance, private investment, trade openness and the population growth. And, the paper found that the population growth is insignificant to the growth of those countries. And, except the population growth other variables have positive and significant effect on economic growth.

Kosimbei, Maingiand and Thuku (2013) have studied the Impact of Public Expenditure Components on Economic Growth in Kenya from 1964-2011. The objective of the research is to find out the impact of the sectoral government expenditure such as, expenditure on health, education, defense, infrastructure and public order and security on the economic growth of country. The study conducted Stationary Test, Causality Test, Co integration Tests before using vector error correction model to estimate the data. The survey showed that though government expenditure on education is positively related to economic growth it does not spur any significant change to growth but the expenditure on health, public and private investment have significant effect on the economic growth of the country.

Deveranjan, Swaroop and Zou (1996) have conducted the research to link the government expenditure to the economic growth of the country. The objectives of the paper are to find out the effect of composition of government expenditure on the economic growth of the country and the effect of the change in composition of government expenditure in the economic growth of the country. It has used the data from 43 different countries over the period of 20 years. It used ADF technique to check the unit root of the data and Johanson cointegration test to see the long run relationship between the variable. It found that the conditions not only depend just on the physical productivity of the different components of the public expenditure but also on the initial shares. And, concluded that an increase in the share of the current expenditure has positive and statistically significant effect on the economic growth of the country. On the other hand, they found that the relationship between the capital component of the public expenditure has negative effect on the per-capita growth and productive expenditure, when used in excess, could become unproductive.

Oyinlola and Akinnibosun (2013) have examined the relationship between the public expenditure and economic growth in Nigeria during the period 1970-2007. The

objectives of the research are to trace out the relationship between the public expenditure and economic growth in Nigeria and to test the Wagner hypothesis. A disaggregated public expenditure level was employed using the Gregory- Hansen structural break co integration technique. The results confirmed the Wagner law in two models in long run; there was a break in 1993 in which the political crisis that engulfed the nation was accountable. The results also showed the economic growth and development are the main objectives of the government expenditure, especially the expenditure in the infrastructure and the human resources all of which falls under social and community services.

Oni and Ozemhoka (2014) have studied the relationship between public expenditure and economic growth in Nigeria. The objectives of the research are to examine the impact of public expenditure on economic growth in Nigeria and to ascertain whether there is a relationship between gross domestic product (GDP) and government expenditure in Nigeria. It used the data over the period of 1981- 2011 and the ordinary least square (OLS) method of the econometric technique was used after checking the stationary of the data by using ADF test. The major findings are there is a positive relationship between the economic growth and public expenditure.

Le and Suruga (2005) have studied the effect of the FDI and public expenditure on the economic growth. The main objective of the paper is to examine linkages between FDI and public expenditure in determining the long term economic growth rate. It has used ADF technique to find out whether the data sets used in research are stationary or not, used cointegration technique to find out the long run relationship between the variables and used Granger causality test to find out the direction of causality among the different variables. The result showed that excessive spending in public expenditure can hinder the beneficial impact of the FDI. So, to achieve the desired growth rate in the economy balance between the FDI and public expenditure should be maintained.

Rahman (2012) has studied on the relationship between the economic growth and expenditure in Sudan. The primary objective of the paper is to test the Wagner hypothesis in Sudan over the period of 1970-2010. The methodology used by the paper to meet the objectives are co integration, causality and error correction model (ECM). After they have tested the Wagner hypothesis for the different countries the

result was conflicting. The results for the Sudan indicate that the data for the periods support of the Wagner hypothesis.

Dritsakis and Adamopoulos (n.d.) have studied the relationship between the government expenditure and the economic growth in the Greek economy. The main objective of the research is to determine the relationship between the public expenditure and the economic growth in the Greek economy by using the Wagner Hypothesis. It has used the data for the time period of 1960 to 2001 and checked the stationary of the variable by using the adjusted Dickey Fuller (ADF) test. The paper has used the co integration technique and Error correction model to check the long run and short run relationship between the variables respectively and used the causality test to find the direction of the causality between the public expenditure and the economic growth. It found that Wagner hypothesis is correct in the major part of the spending such as health care, education, culture etc., all of them are proposing the higher long term elasticity towards development. In overall the paper concluded that the Wagner hypothesis is applied in the Geek economy.

Mulamba (2009) has examined the long run relationship between the public expenditure and economic growth in the SADC countries. The objectives of the study are to investigate the validity of the Wagner's law and the Keynesian perspective of a long run relationship and causality between the government expenditure and economic growth in SADC countries. This research used the data sets from 1998 to 2004. In order to determine the existence of the long-term relationship and causality, a univariate analysis is carried out to assess whether panel series are integrated in the same order or not. Co integration between the government expenditure and the economic growth has been carried out. This study applies two procedures of the panel co integration, namely, the pedroni panel cointegration test and Kao panel cointegration test. Empirical analysis showed that the long run relationship exists between the government expenditure and the economic growth in the SADC countries. Also, there is unidirectional causality and economic growth Granger causes government expenditure in both the short run and long run which is consistence with the Wagner's law than the Keynesian stance.

Yilgor, Ertugrel and Celepcioglu (2009) have studied the relationship between the public expenditure and economic growth in Turkey. The main objective of the

research is to find out the effect of the public expenditure on the economic growth of the country. It has used the data sets over the period of 1980-2010. It examined the data by the ADF and PP test to find out whether the data sets are stationary or not. Johanson cointegration technique and VAR model was used to check the cointegration between the variables and Granger Causality test was applied to check the causality between the government expenditure and economic growth. The research concluded that current expenditures, transfer expenditures, and total expenditures are related to growth in Turkey's economy and one-way causality was found from current, transfer, and total expenditures to economic growth in Turkey.

Tylor (1961) has published a book. It has explained the relevance of the public expenditure on the economic growth. The public expenditure stressed the expansion of government had often been characterized a movement in the direction of socialism that government obviously trended to socialize through public expenditure. It helped to correct the disorder that had created by cyclical fluctuation which mostly appeared during the depression. "public works projects and landing functions during the depression were in situated to cushion the effects of the worst features of capitalism –its recurrent tendency to break down." "Pump-Priming" the injections of the public expenditures to fill a void left by deficient private expenditure in recession has as its goal the prevention of serious break down.

Ogbokor (2015) has studied about the dynamic relationship between the government expenditure and economic growth in the Namibia. The objectives of the research are to find out the relationship between the government expenditure and economic growth and to check the direction of causality between them. The annual time- series macroeconomics secondary data-set from 1990 to 2013 were used. Paper used the two- step Engle- Granger approach to check the causality between the variables and it uses the cointegration technique to check the long run relationship between them. The study found co-integration relationships among public expenditure and economic growth and there is unidirectional causality between them. Further, the study found that government spending and expenditures on education and health are all weak predictors of economic growth.

Bin (2011) has studied the association of the public expenditure and economic growth in Malaysia. The objectives of the research are to find out the association and

effect of the government development expenditure in the economic growth of the country. It has used the data set for the year 1970 to 2007. It used ADF and PP to check the stationary of the data sets. And, it has used Johnason cointegration technique to find out the long run relationship between the variables. This study found that the rising of the total government development expenditure has a significant and negative relationship with economic growth. Similar results apply to the total government development expenditure in economic services. However, this study found no relationship between total government development expenditure in social services and economic growth. In addition, it has found mix results for the association between government development expenditures by sectors and economic growth. Out of eleven sectors, only three sectors which are transport, Public utilities and health have positive and significant relationship towards economic growth.

Imran (2013) has examined the relationship between the public expenditure, economic growth and poverty in Bangladesh. The objectives of the thesis are to review and analyze the trends in government expenditure and its composition in a Bangladesh perspective, and to develop an analytical framework for determining differential impacts of various public investments on economic growth and poverty alleviation. It used 31years time series data to see the impact of the various components of the government spending on poverty and GDP growth. It used ADF test to check the stationary of the data. It has used Granger causality test to check the causality between the public expenditure with economic growth and poverty alleviation and used Johanson cointegration test and VAR model to check the long run relationship and short run relationship between them respectively. It found there is not any significant impact of government spending on economic growth and poverty reduction in the Bangladesh. It found two layers' agency problem namely; between the citizens and politicians and between politicians and service providers; "appeared in the public expenditure management hierarchy.

Ketema (2006) has examined the relationship between the public expenditure and economic growth in Ethiopia. The main objectives of the research are to find out the effect of the government expenditure, to find the trend and pattern of the public expenditure and the effects of the various components of the government expenditure in the economy of the Ethiopia. It has used data for the period 1960/61-

2003/4. It has used ADF test to determine wheather the data sets are stationary or not, used Engle -Granger two step procedure to check the cointegration among the variables and applied VECM technique to know the short run relationship between them. It found only expenditure on human capital have long-run significant positive impact. Investment, government spending displays a negative but insignificant impact on growth of real GDP, which again reveals the inefficiency and poor quality nature of public investment. In the short run, all components of government expenditure do not have significant meaning in explaining economic growth.

Kapunda and Topera (2013) have examined the relationship between the government expenditure and economic growth in Tanzania. The main objectives of the research are to find the trend and pattern of government expenditure composition and how it influences economic growth in Tanzania. It has used the data set between the period of 1965-2010. It has used the simple OLS technique and the t-test as a methodological tool after checking wheather the data sets are stationary or not. The study showed that factors which contribute positively and significantly to economic growth are capital expenditure and terms of trade. Other variables which influence growth positively, but not significantly, are expenditure on health, agriculture, public services, defense and infrastructure. Others are real exchange rate, real foreign interest rate and private policy measured by a dummy. Recurrent expenditure and few other factors have negative impact on growth.

Sever, Drezgic and Blazic (2011) has examined the relationship between the Budget spending and economic growth in Croatia. The objective of this research is to analyze the relationship between government budget spending and the effect on the growth and structure of the GDP of Croatia during the past two decades. It has used ADF technique to check the unit root of the variables, used Johanson cointegration test to check the long run relationship between the variables and used VAR technique to see the short run relationship among the variables. The major Findings were the positive effects of investment spending and purchase of goods and services and the negative effects of other categories of current spending, showed the reduction of capital expenditures during the recession presents a particularly adverse trend, which reduces the rate of growth of the economy in the short term. Finally, the

research conclude that the budget expenditures have not adequately affected the GDP growth.

Emmanuel (2014) has examined the nexus between the public expenditure and economic growth in Nigeria. The objectives of the research are to find out the trend of public expenditure in Nigeria and to find the relationship between the public expenditure and economic growth in Nigeria. The paper test for presence of stationary by using augmented Dickey Fuller (ADF) unit root test, results reveals that all the variables incorporated in the model were non-stationary at their levels. To establish long –run relationship between public expenditure and economic growth, the results reveal that the variables are co integrated at 5% and 10% critical level. To check the short-term relationship, it has used error correction model. The results of the research showed that private and public investments have insignificant effect on economic growth during the period under review.

Jaroensathapornkul (2010) has studied the effect of public spending in the economic growth in the economy of the Thailand. The major objective of the research is to analyze the dynamic effects of the proportional change in government spending on the economic growth in the economy of Thailand. The analytical methods used in the process are stationary test of time series data, cointegration test between government spending and economic growth, and error correction model estimation. The results showed that the expenditure variables had long-run equilibrium relationship with the economic growth variable. The ECM estimation revealed that the financial instrument, i.e. expenditure budgeting should be further applied to drive Thailand's economic growth. However, the current expenditure scheme was considered unproductive.An increased expenditure proportion to enhance the quality of education was found ineffective.

2.3Nepalese Context

Shrestha (2009) has studied the relationship between the various Composition of Public Expenditure and Economic Growth in Nepal. Objectives of the research are to determine the effect of the various composition of public expenditure on economic growth of Nepal. It has used the time series model with the application of the endogenous growth model to measure the effect of the public expenditure on the

different headings in the economic growth of Nepal. It has applied ADF technique to test the unit root of the variables and run the OLS technique. The major findings of the research are so long as productivity of the expenditure is higher than the interest rate, increase in expenditure will increase the growth rate in the economy and physical infrastructure plays the very important role to enhance economic growth by promoting private market production.

Sharma (2013) has studied the effect of public expenditure on the economic growth of Nepal. The major objectives of the research are to find the trend and pattern of the public expenditure and its effect on the economic growth of Nepal. It has used the simple OLS technique and checked autocorrelation to find the relationship between public expenditure and economic growth. The major findings of the research are share of development expenditure over total expenditure is decreasing over time, share of current expenditure over total expenditure is increasing over time and there is very low correlation between the government expenditure and economic growth in Nepal.

Aryal (2011) studied the trend, structure and effect of the public expenditure in economic growth of Nepal. The major objectives of the research are to examine the trend and structure of public expenditure, to show the relationship between economic growth and GDP growth rate and to find out the various factors that influence the economic growth. It has used the data set for 23 years and used the simple OLS with two variables that are public expenditures and economic growth. It used R^2technique to see the significance of the model, used adjusted R^2 to select the model used t- test for the significance of the individual variable. The major findings are the share of public expenditure on the GDP is increasing over time, the share of current expenditure in the total expenditure is higher than the capital expenditure on the total expenditure and there is not any significant relationship between the public expenditure and economic growth.

Rana (1988) has analyzed the fiscal system of Nepal. The objectives of the research are to find out the trend in revenue, expenditure and the budget deficit in Nepalese economy. It used the data between the period 1964/65 to 1986/87. It used only the descriptive analysis to achieve the objectives. The major conclusions are there has been the constant increasing trend in revenue and expenditure. The trend of

increasing in regular and development expenditure have created a continuous deficit that has compelled the government to rely excessively upon foreign aid. Finally, it found that the budget deficit is also increasing over time.

Upreti (2002) analyzed the trend, pattern and impact of public expenditure on economic growth. The major objectives of the research are to find the trend and pattern of the public expenditure in Nepal and to check the impact of public expenditure on economic growth. Simple OLS techniques was used to find the relationship among the variables and R^2 has used to check the significance of the model. It has used the data set from 1974/75 to 1991/92. The major findings of research are the growth of public expenditure has taken place rapidly than the growth of GDP. The growth rate of the development expenditure is decreasing over time but the growth rate of the recurrent expenditure is increasing. Expenditure on agricultural sector is not friendly to create more employment while more that 80 percent employment has been providing for agricultural sector. But, on the other hand, the higher average growth rate of public expenditure to agricultural sector has become unsuccessful to get more GDP growth rate from agricultural sector.

Kanel (1988) has examined the growth, pattern and impact of Public expenditure on the economic growth of Nepal. The major objectives of the research are to find out the growth and pattern of public expenditure and its impact on the economic growth of Nepal. It has used the data from 1965 to 1981.It has used simple OLS technique to find out the relationship between the variables and used R^2 to analyze the significance of the model. It examined reasons to public expenditure growth through both supply and demand oriented factors. The major findings of the research are major expansion of the public expenditure had taken place only after 1970, Over the study period development expenditure grows faster than the recurrent expenditure and elasticity coefficient for total development expenditure, economic services and social services with respect to per capita income being more than unity. At the same time, it found that the elasticity coefficient for the public investment being less than unity.

Basnet (1983) has studied the pattern of resources gap and analyzed the trend of public expenditure. The main objective of the research is to find out the trend of the public expenditure and resource gap. It has used the data set from 1964/65 to

1980/81. It has used the descriptive analysis to achieve the objective of the research. The major conclusion of the research is the growth rate of the regular expenditure is higher than the growth rate of the development expenditure, growth rate of total government expenditure is higher than the growth rate of the total government revenue and there was increasing trend in the budget deficit.

Khadka (1998) studied the role and trend of public expenditure and problem of resource mobilization. The major objectives of the research are to find the trend of public expenditure in the Nepalese economy and the relationship between the public expenditure and problem of resource mobilization. It has used the data from 1974/75 to 1994/95. It used log linear regression model to analyze the data. It used t- test to check the significance of the individual variable andR^2 to check the overall significance of the model. It found that there is positive and significant relationship between total expenditure and GDP and regular expenditure and total government revenue. However, the relationship between development expenditure and total government revenue and foreign aid is weak.

Bhusal (2014) has studied the relationship between the government spending and economic growth in Nepal. The objectives of the research are to test the Wagnerian hypothesis in Nepalese economy, to check the causality between the economic growth and government spending and to check the long run relationship between them. The research used the data set for the period of 1975-2012. It has used ADF test to check the unit root of the variable. Johanson cointegration test and error correction model(ECM) are used to check the long run and short run relationship between the variables respectively and Granger Causality test is used to check the direction of causality among the variables. The findings of the research are Wagnerian hypothesis do not exists in Nepalese economy, there exists both short run and long run relationship between the government spending and economic growth in Nepal and Granger causality test shows that Government Spending Granger Causes economic growth but economic growth does not Granger causes government spending.

Gyanwaly (2014) has examined the relationship between the financial development and economic growth in Nepal. The main objectives of the research are to find out the relationship between the financial development and economic growth in Nepal. It

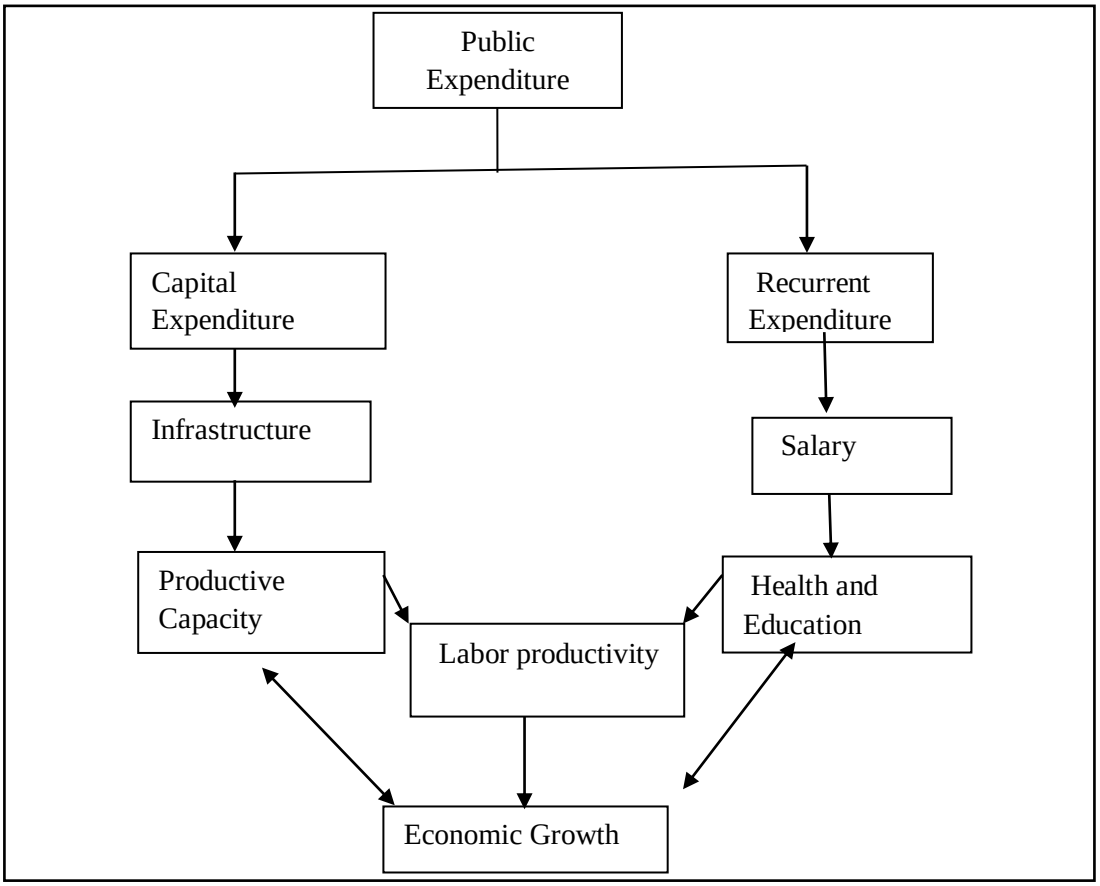
has used the data for the period of 1975 to 2014. It has developed the financial index by taking the weighted average of the different indicators of the financial development. After this it has used ADF test to check the stationary of the variables and used johanson cointegration technique and error correction model (ECM) to check the long run relationship between the variables. The findings of the research are financial development, real stock of capital, real per capita capital, labour force, real export and government expenditure have significantly positive relationship with economic growth while inflation and trade openness have significantly negative relationship with economic growth.

CHAPTER III
RESEARCH METHODOLOGY

3.1. Research Framework

The impact of the public expenditure can be traced out in the recurrent expenditure and capital expenditure. After this development of infrastructure depends upon the capital expenditure and salary depends upon the recurrent expenditure respectively. Infrastructure has a role on the development and the productive capacity of the country and so do salary has on the health and education. Ultimately, the productive capacity, health and education have dual impact. One is on the labour productivity and another is directly on the economic growth. Also, the labour productivity is also directed towards the economic growth. Moreover, the economic growth also has the reversal effect on the productive capacity, health and education. This thesis has used the research framework used by (Urhie, 2013). That is given in Figure 3.1.

Figure 3.1: A Framework for Public Expenditure and Economic Growth



3.2. Research Design

This thesis has a main objective that is to find the relationship between the public expenditure and economic growth. To achieve the objectives different techniques have been employed. Mostly the quantitative techniques are used. Besides, that qualitative analysis has also been carried out in some cases. This study is based on certain research methodology consisting unit root test, cointegration test and Granger causality test.

3.3. Sources of Data

To complete the research, the secondary data sets published by the government and non- governmental institutions; that are published books, magazine, journal etc. are used. Basically, the data has been collected from the publication of the ministry of finance, Nepal Rasta Bank, CBS and the department of the hydrology and metrology. Data set for the period of the (1974/75-2014/15) has been taken under consideration for research. Because, this time helps to know the government expenditure pattern before and after the restoration of the democracy and compare it with the republican era. So, the population of the data is the time series data of government expenditure, GDP, average rainfall, gross fixed capital formation and openness of trade; and the sample of the data will be the data sets for public expenditure, GDP, average annual rainfall and gross fixed capital formationbetween the 1974/75 and 2014/15.

3.4. Explanation of Variables

In this study, for both quantitative and qualitative purpose various variables have been used that are explained as

Government Expenditure (GE): Government expenditure or total expenditure means the actual expenditure made by government during the specified year. It has been taken from the economic survey.

Gross Domestic product (GDP): GDP is the total monetary value of final goods and services produced in the geographical territory of the country. It will be taken out exclusively from the economic survey.

Openness of Trade (OT): Openness of trade is the index that shows the ratio of country's total trade to the GDP of the country. It is calculated by the formula:

$$\mathrm{OT} = \frac{\mathrm{Export} + \mathrm{Import}}{\mathrm{GDP}}$$

Government Revenue (RG): Government revenue is the total income received by the government in the fiscal year through the various sources including tax revenue and non-tax revenue. For the purpose of this study only the tax revenue is taken as the government revenue. Data for government revenue is taken from economic survey.

GDP Growth Rate (GGR): GDP growth rate is the rate of change in the real GDP of a country in a fiscal year. It is calculated by the following formula:

$$\mathrm{GGR} = \frac{\mathrm{GDP_t} - \mathrm{GDP_{t-1}}}{\mathrm{GDP_{t-1}}} \times 100\%$$

Data for GGR is taken from economic survey.

Government Revenue GDP Ratio (GRGR): Government revenue GDP ratio is the ratio of the government revenue to the GDP. It is calculated by the following formula

$$\mathrm{GRR} = \frac{\mathrm{Government\ Revenue}}{\mathrm{GDP}}$$

Government Expenditure GDP Ratio (GEGR): Government expenditure GDP ratio is the ratio of the government expenditure to the GDP. It is calculated by the following formula

$$\mathrm{GEGR} = \frac{\mathrm{Government\ Expenditure}}{\mathrm{GDP}}$$

Government Expenditure Government Revenue Ratio (GERR): Government expenditure government revenue ratio is the government expenditure to the government revenue. It is calculated by the following formula

$$\mathrm{GERR} = \frac{\mathrm{Government\ Expenditure}}{\mathrm{Government\ Revenue}}$$

Average Annual Rainfall (RF): Average annual rainfall is the average of the annual rainfall taken from 20 different stations of Nepal that are distributed in all three-geographical region that are Himalayan region, mountain region and terai region; similarly, that are distributed in 5 development regions.

3.5. Tools of Data Analysis

This thesis relies on the time series data collected from 1975 to 2015. Tools of data analysis should be used per the time series properties and nature of the data.

3.5.1. Unit Root Test

A time series is a collection of observations made sequentially through time. A time series is said to be stationary if its mean and variance are constant over time and the value of the covariance between the two-time periods depends only on the distance or gap or lag between the two-time periods and not the actual time at which the covariance is computed. The stationary or otherwise of a series can strongly influence its behaviour and properties- e.g. persistence of shocks will be infinite for non stationary series. If the time series data is not stationary there is the problem of spurious regression i.e.; if two variables are trending over time, a regression of one on the other could have a high R^2 even if the two are unrelated. Secondly, If the variables in the regression model are not stationary then it can be proved that the standard assumptions for asymptotic analysis will not be valid. In other words, the usual t- ratios will not follow a t- distribution, so we cannot Validly undertake the hypothesis tests about the regression parameters. Thus, before performing any kind of the test or the model it is necessary to find out whether the data are stationary or not and that can be done by using the unit root test.

There is various method of testing the unit root in the data. This paper uses Augmented Dickey Fuller (ADF) test for the purpose. The ADF is better approach to check whether the data sets are stationary or not because of its robustness and the capacity to remove auto correlation from the model. While the Augmented Dickey-Fuller approach accounts for the autocorrelation of the first differences of a series in a parametric fashion by estimating additional nuisance parameters (Gujarati &Porter, 2009). In equations (1) and (2) below the series of interest is X_t . The symbol Δ indicates the first difference of the series X_t ,t in equation (2) is a time trend, and k is the number of lagged variables that are used to ensure the error term e is white noise. The optimal number of lags can be determined by various ways, for the purpose of this paper it is found by using the Akaike Information Criterion (AIC) for the significance of the estimated coefficients of these lagged variables.

$$\Delta X_t = \alpha_1 + \gamma_1 X_{t-1} + \sum_{i=1}^{k} c_{1i}\ \Delta X_{t-i} + e_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$\Delta X_t = \alpha_2 + \gamma_2 X_{t-1} + \beta t + \sum_{i=1}^{k} c_{2i}\ \Delta X_{t-i} + e_{2t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where, k is the number of lags.The ADF techniques tests the null hypothesis $\gamma_i = 0$, against the alternative hypothesis $\gamma_i < 0$. Rejection of the null hypothesis is an indication that the series X_t is stationary. In equation (1) the alternative hypothesis indicates the series is a mean-stationary and in equation (2) it indicates the series is a trend stationary.

3.5.2. Cointegration Test

If the non-stationary time series tend to revert to a common long term trend, they are said to be cointegrated. Cointegration, thus, means long run relationship between variables. In the short run, the variables may drift apart, but pulled back to the long run equilibrium (Greene, 2011).

The regression analysis on time series has been much benefited from the concept of cointegration by Granger (1981) and Engle and Granger (1987). They showed that using OLS in case of I (1) variables could be dangerous because a non- stationary series violates the basic assumptions of OLS and as such one cannot get the best linear unbiased estimators (BLUE) and there may exist the spurious or non-sense correlation between non-stationary variables. In the case where the variables are non-stationary at levels but are difference stationary, cointegration methodology allows researchers to test for the presence of long run equilibrium relationships between economic variables. If the separate economic time series are stationary after differencing or they are integrated of order one, but a linear combination of their levels is stationary, then the series are said to be integrated. On other words, two or more I (1) time series are said to be cointegrated if some linear combination of them is stationary. Formally, given X_t and Y_t are integrated of order one I (1) or are difference stationary processes, they are said to be cointegrated if there exists a parameter α such that $u_t = y_t - \alpha x_t$ is a stationary process or is integrated of order zero I (0).

Tests for cointegration seek to discern whether a long- run relationship exists among such a set of variables. In this research ARDL approach of the cointegration is applied.

3.5.2.1. Autoregressive Distributed Lag Model (ARDL) to cointegration Analysis

One of the approach to check the cointegration among the variables is ARDL bound test. It is introduced by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (1997, 2001). This test has several advantages over the well-known residual-based approach proposed by Engle and Granger (1987) and the maximum likelihood-based approach proposed by Johansen and Julius (1990) and Johansen (1992). The advantages of ARDL model can be stated as:

i. The ARDL procedure can be applied whether the regressors are I (1) and/or I (0), while Johansen cointegration technique require that all the variables in the system be of equal order of integration. This means that the ARDL can be applied irrespective of whether underlying regressors are purely I (0), purely I (1) or mutually cointegrated and thus no need for unit root pre- testing.
ii. Johanson cointegration requires large data samples for validity, the ARDL procedures is statistically more significant approach to determine the cointegration relation in small samples.
iii. The ARDL procedures allows that the variables may have different optimal lags, while it is impossible with conventional cointegration procedures.
iv. The ARDL technique generally provides unbiased estimates of the long run model and Validates the t- statistics even when some of the regressors are endogeneous.
v. The ARDL procedure employs only a single reduced from equation, while the conventional cointegration procedures estimate the long-run relationship within a context of system equations.

3.5.2.2. Error Correction Modeling (ECM)

Even if Y_t and X_t variables are cointegrated that means they have long run relationship between them, there may be disequilibrium in the short run. Thus, the error term $u_t = Y_t - \beta_1 - \beta_2 X_t$ in the regression equation $Y_t = \beta_1 + \beta_2 X_t + u_t$is called the equilibrium error. This error term is used to tie the short run behavior of Y to its long run value. The Granger representation theorem says that if two variables Y_t and X_t are cointegrated, then the relationship between the two can be expressed as Error Correction Modeling as:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 u_{t-1} + \epsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where,

ϵ_t= A white noise error term.

This equation can be written as

$$\Delta Y_t = \beta_1 + \beta_2 \Delta X_t + \delta ECM_{t-1} + \epsilon_t$$

The ECM in equation (3) states that ΔY_t depends on ΔX_t and on the equilibrium error term. If the error term is non-zero, the model is out of equilibrium. Here the value of α_2 decides how quickly the equilibrium is restored.

3.5.3. Bound Test (F-Version)

The F-test can be used to test the hypothesis related to any number of parameters Obtained from K-variable regression model:

$$Y_t = \alpha_1 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + \beta_n X_{kt} + v_i \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Now the hypothesis to be tested can be written as,

$$H_0: \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$$

Then, another regression by dropping the variables $X_{4i}, X_{5i}, X_{6i}$and X_{7i} can be written as

$Y_t = \alpha_1 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_8 X_{8t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + \beta_n X_{kt} + v_i \ldots\ldots\ldots\ldots\ldots\ldots$ (5)

And, Residual sum of the squares is calculated from the both models. The first equation is called unrestricted regression and second restricted is called regression. The F test statistic is calculated by the formula

$$F = \frac{(RSS_R - RSS_{UR})/m}{RSS_{UR}/n-k}$$

Where,

RSS_R =RSS of the restricted regression,

RSS_{UR} =RSS of unrestricted regression,

m= number of restrictions

k= number of parameters in unrestricted regression and

n= number of observations

According to Pesaran (1997), the bounds test can be used to test the long run relationship in above equation. If F- test exceeds their irrespective critical values, it can be concluded that there is evidence of long run relationship between the variables regardless of the order of integration of the variables. If the test statistics is below the upper critical values we cannot reject the null hypothesis of cointegration and if it lies between the bound, a conclusive inference cannot be made without knowing the order of integration of the underlying variables.

3.5.4. Recursive Residuals, CUSUM Test and CUSUMSQ Test

In recursive least,square, the equation is estimated repeatedly, using ever larger subsets of the sample data. If there are K coefficients to be estimated in the regression, then the first K observations are used to form the first estimate of the parameters. The next observation is then added to the data set and K+1 observations are used to compute the second estimate of the parameters. This process is repeated until all the T sample points have been used to predict the next value of the dependent variable. The one -step ahead forecast error resulting from this prediction, suitably scaled, is defined to be recursive residual.

3.5.4.1. CUSUM Test

The CUSUM test is based on the cumulative sum of the recursive residuals. This option plots the cumulative sum together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines.

The CUSUM test is based on the statistic

$$W_t = \sum_{r=k+1}^{t} \frac{w_r}{s}$$

For t= k+1 ……. T, where W_t is the recursive residual and s is the standard error of the regression fitted to all sample points T. If the vector of the parameter remains constant from period to period, $E(W_t) = 0$, but if this vector changes, W_t will tend to diverge from the zero-mean value line. The significance of any departure from the zero line is assessed by reference to a pair of 5% significance lines, the distance between which increases with t.

The 5% significance lines are found by connecting the points

$\left[k, \pm 0.948(T-k)^{\frac{1}{2}}\right]$ and $\left[T, \pm 3 \times 0.948(T-k)^{\frac{1}{2}}\right]$

Movement of outside the critical lines is suggestive of coefficient instability.

3.5.4.2.CUSUMSQ Test

The CUSUM of squares test is based on the test statistic

$$W_t = \frac{\sum_{r=k+1}^{t} w_r^{\,2}}{\sum_{r=k+1}^{T} w_r^{\,2}}$$

The expected value under the hypothesis if parameter constancy is $E(S_t) = \frac{t-k}{T-k}$, which goes from zero to unity. The significance of the departure of forms its expected value is assessed by reference to pair of parallel straight lines around the expected value. The CUSUM of Square test provides a plot of against and the pair of 5% critical lines. As with the CUSUM test, movement outside the critical lines is suggestive parameter of variance of instability.

3.5.5. Granger Causality Test

X is said to Granger – cause Y if Y can be better predicted using the histories of both X and Y than it can by using the history of Y alone (Greene, 2013). To obtain the objective of the research that whether there is causality between the real GDP and real public expenditure, this research uses the Granger Causality test. Granger has started his causality analysis from the premise that the future cannot cause the present or past. If event A occur after event B, we know that A cannot cause B. At the same time if A occurs before B, it does not necessarily imply that A Cause B. Consider two-time series Y_t and X_t, the series X_t fails to Granger cause Y_t if in a regression of Y_t on lagged Y's and lagged X's, the coefficient of later is zero (Maddala, 2009).

We can test for the presence of Granger causality by estimating the following VAR model

$$\Delta Yt = a0 + a1\Delta Yt-1+\ldots.+ap\,\Delta Yt-p + b1\Delta Xt-1+\ldots.+bp\Delta Xt-p + ut \quad (6)$$

$$\Delta Xt = c0 + c1\Delta Xt-1+\ldots.+cp\Delta Xt-p + d1\Delta Yt-1+\ldots.+dp\Delta Yt-p + vt \quad (7)$$

It is assumed that disturbances u_t and v_t are uncorrelated.

Then, by checking the following hypothesis it gives the result for the existence of the Granger causality and the direction of causality.

H_0: $b_1 = b_2 = ... = b_p = 0$, i.e., X does not have effect on Y.

H_1: At least one $b_i \neq 0$ i.e., X has effect on Y.

Similarly, H_0: $d_1 = d_2 = ... = d_p = 0$, i.e., Y does not have effect on X.

H_1: At least one $d_i \neq o$ i.e., Y does not have effect on X.

Again, H_0: $b_1 = b_2 = ... = b_p = 0$ and $d_1 = d_2 = ... = d_p = 0$, X and Y are independent. There is no Granger Causality in any direction.

H_1: At least one $b_i \neq 0$ and At least one $d_i \neq o$, both X and Y causes each other. There is bidirectional causality among X and Y.

3.5.6.LM, Normality and Heteroscedasticity Test:

LM test is used to test the serial correlation in the data. Normality test is used to check whether the data are normally distributed or not and the heteroscedasticity test is used to check the homoscedasticity of the error term. For all the them probability values will be checked and if the p- values are higher than the critical values. Then, it can be concluded that there is no serial correlation, the data is normally distributed and the error term is normally homoscedasticity.

3.6. Specification of Model

Model will be specified based on the of the various dependent and independent variables since the economic literature and some of the econometric tools. Econometric tools will be discussed on the model selection criteria and economic variables will be discussed in the relationship between public expenditure and economic growth.

3.6.1. Model selection Criteria

Model selection criteria are used to choose a model from the alternative models. This research used adjusted R^2 criterion

It is calculated as:

$$\bar{R}^2 = 1 - \frac{RSS/n-k}{TSS/n-1}$$

Where,
RSS= residual sum of square
TSS= total sum of square.
n= number of observations
k= number of parameters in regression modelon the basis of this method a model with highest $\bar{R}^2$ is chosen.

3.6.2.Relationship between Public expenditure and Economic Growth

The general objective of the research is to find out the relationship public expenditure and economic growth in Nepal. Since, there exists other variables too that determine the economic growth of the country. For this thesis, it has used annual average rainfall, openness of trade and gross fixed capital formation as the control

variable. So, the general model that shows the relationship between the public expenditure and economic growth can be written as

$$RGDP = \beta_0 + \beta_1 RGE + \beta_2\ RF + \beta_3 OT + \beta_4\ INT + e_i \ldots\ldots\ldots\ldots\ (1)$$

Where,

$RGDP = $ Real GDP

$RGE = $ Real Government Expenditure

$OT = $ Openess of Trade

$INT = $ Real Gross Fixed Capital Formation

RF = Annual Average Rainfall

$e_i = $ Stochastic Error term

Since, the unit of the variables in the equation (1) are not same. So, it is necessary to take logarithm. It can be written in the logarithm form as

$$LN\ RGDP = \beta_0 + \beta_1 LN\ RGE + \beta_2\ LN\ RF + \beta_3 LN\ OT + \beta_4\ LN\ INT + \\ + e_i \ldots\ldots\ldots\ldots\ (2)$$

The ARDL formulation of (2) can be written as:

$$\Delta LNRGDP_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i}\, \Delta LN\ RGDP_{t-i} + \sum_{j=1}^{q} \beta_{2i}\, \Delta LN\ RGE_{t-j} + \sum_{k=1}^{r} \beta_{3i}\, \Delta LN\ RF_{t-k} + \\ \sum_{l=1}^{s} \beta_{4i}\, \Delta LN\ OT_{t-l} + \sum_{m=1}^{t} \beta_{5i}\, \Delta LN\ INT_{t-m} \quad + \alpha_1 LN\ RGDP_{t-1} + \alpha_2 LN\ RGE_{t-1} \ + \alpha_3\ LN\ RF_{t-1} + \\ \alpha_4\ LN\ OT_{t-1} + \ \alpha_5\ LN\ INT \quad _{t-1} + \mu_t \ldots\ldots (3)$$

Δ is the first difference operator, $\beta_0$the drift component, and μ_t the usual white noise residuals; p, q, r, s and t are the number of lags. The coefficients (α_1-α_5) represent the long-run relationship whereas the remaining expressions with summation sign ($\beta_1 - \beta_5$) represent the short-run dynamics of the model.

3.6.2.1. Hypothesis

To investigate the existence of the long-run relationship among the variables in the system, the bound tests approach developed by Pesaran et al. (2001) has been employed. The bound test is based on F-statistic and follows a non-standard distribution. Under this the null hypothesis and alternative hypothesis can be stated as:

Null Hypothesis (H_0):$\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$.

Alternative Hypothesis (H_1): $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$.

Pesaran et al. (2001) provide the two sets of critical values in which lower critical bound assumes that all the variables in the ARDL model are I (0), and the upper critical bound assumes I(1). If the calculated F-statistics is greater than the appropriate upper bound critical values, the null hypothesis is rejected implying cointegration. If such statistics is below the lower bound, the null cannot be rejected, indicating the lack of cointegration. If, however, it lies within the lower and upper bounds, the results are inconclusive. After establishing the evidence of the existence of the cointegration between variables, the lag orders of the variables are chosen by using the appropriate Akaike Information Criteria (AIC).

The unrestricted error correction model based on the assumption made by Pesaran et al. (2001) was also employed for the short-run dynamics of the model. Thus, the error correction version of the ARDL model pertaining to the equation (3) can be expressed as:

$$\Delta \text{LN RGDP}_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \text{LN RGDP}_{t-i} + \sum_{j=1}^{q} \beta_{2i} \Delta \text{LN RGE}_{t-j} + \sum_{k=1}^{r} \beta_{3i} \Delta \text{LN RF}_{t-k} + \sum_{l=1}^{s} \beta_{4i} \Delta \text{LN OT}_{t-l} + \sum_{m=1}^{t} \beta_{5i} \Delta \text{LN INT}_{t-m} + \sigma \text{EC}_{t-1} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4).$$

Where, σ is the speed of adjustment parameter; p, q, r, s and t are the number of lags and EC is the residuals that are obtained from the estimated cointegration model of equation (2). The error correction term (EC) is, thus, defined as

$$\text{EC}_t = \text{LN RGDP}_t - \gamma_1 \text{RGE}_t - \gamma_2 \text{RF}_t - \gamma_3 \text{OT}_t - \gamma_4 \text{INT}_t \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

where, $\gamma_1 = -\frac{\alpha_2}{\alpha_1}$, $\gamma_2 = -\frac{\alpha_3}{\alpha_1}$, $\gamma_3 = -\frac{\alpha_4}{\alpha_1}$ and $\gamma_4 = -\frac{\alpha_5}{\alpha_1}$ are the OLS estimators obtained from equation (2). The coefficients of the lagged variables provide the short run dynamics of the model covering the equilibrium path. The error correction coefficient (**λ**) is expected to be less than zero and implies the cointegration relation. To check the performance of the model, the diagnostic tests associated with the model which examines the serial correlation, functional form and heteroscedasticity have been conducted

3.6.3.Causal Relationship between Public Expenditure and Economic Growth

The third objective of the research is to find out the causal relationship between the government expenditure and economic growth in Nepal. By using Granger Causality approach, the basic model applied for this purpose can be written as:

$$RGDP = \alpha + \sum_{i}^{n} \beta_i RGE_{t-i} + \sum_{j}^{k} \gamma_j RGDP_{t-j} + \mu_{i1} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

And,

$RGE = \varphi + \sum_{i}^{n} \delta_i RGE_{t-i} + \sum_{j}^{k} \theta_i RGDP_{t-j} + \mu_{i2} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (7)$

Where, n is the lag length.

3.6.3.1. Hypothesis

The following hypothesis has been tested to find the direction of causality among the variables

First hypothesis for Granger Causality test

Null Hypothesis (H_0): If all $\beta_i = 0$ RGE does not has effect on the RGDP.

Alternative Hypothesis (H_1): If at least $\beta_i \neq 0$ RGE has effect on the RGDP.

Second hypothesis for Granger Causality Test

Null Hypothesis (H_0): If all $\theta_i = 0$ RGDP does not has effect on the RGDP.

Alternative Hypothesis (H_1): If at least $\theta_i \neq 0$ RGDP does not has effect on the RGDP.

CHAPTER IV
PRESENTATION AND ANALYSIS OF DATA

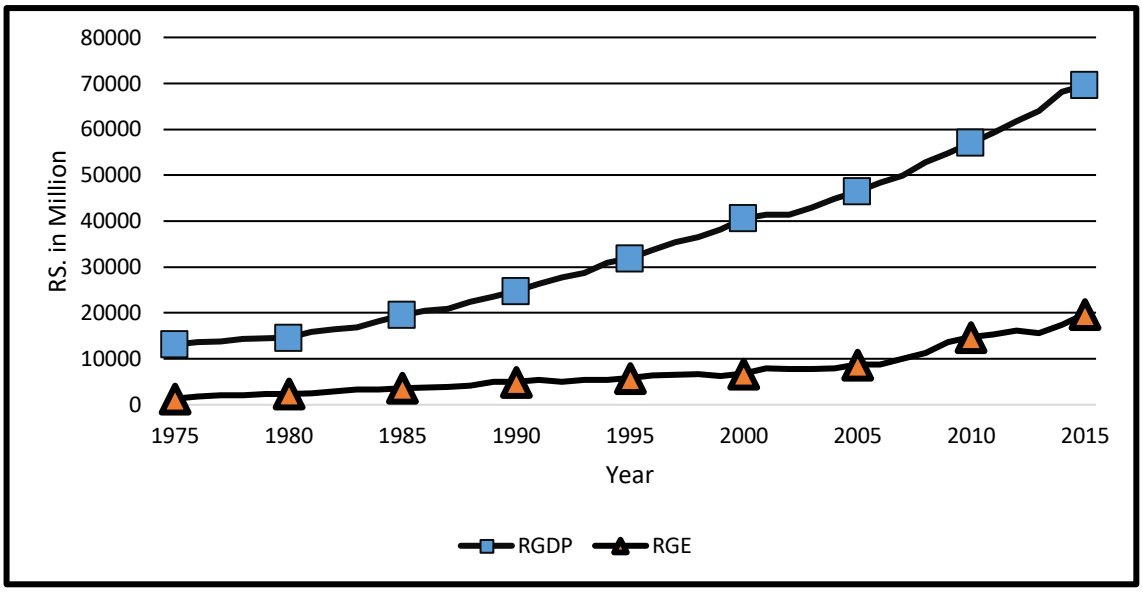
4.1. Nature and Trend of Government Expenditure and GDP

Descriptive analysis is carried out to analyse the trend and structure of the government expenditure in Nepal and GDP in Nepal. The help from the different volume of the economic survey and various publication of Nepal rastra bank have been taken for the descriptive analysis. GDP and public expenditure has been adjusted by the GDP deflator and CPI respectively for the analysis.

The public expenditure has been increasing during the study period (1975-2015). It is decreased in 5 fiscal years among 41 fiscal years; that are in 1989, 1998, 1999, 2002 and 2013. The growing government expenditure has both the short and long run effects in the economy. Changes in government expenditure causes changes in public consumption and public investment that creates changes in demand for goods and services through the multiplier and accelerator effect and thereby changes in aggregate output. The demand pressure of the public services is increasing due to increasing level of money income and population growth and its subsequent impact on the density of population and urbanization. The increasing trend of the government expenditure can be seen in the figure.

GDP of the country is also always increasing over the period. RGDP is decreased in the one fiscal year. That is in the year of 2001.This is because the due to the armed conflict in the country many infrastructures have been destroyed and there was sharp decrease in the investment from the domestic and international area. Thus, it decreases the economic activity in the country and hence decreases the RGDP. On the other hand, it is increasing over the period. Because, on the span of time there was improvement in the education, health indicators, access of the road in the rural villages and the improvement in the Human Development Index (HDI). These are the improvement in the knowledges and per the endogenous growth models the positive improvement in the knowledges and education have the positive impact in the economic growth. Thus, on the span of the time there is increase in the RGDP. The trend and nature of RGDP and RGE is given in Figure 4.1.

Figure 4.1: Trend of Real GDP (RGDP) and Real Government Expenditure (RGE) RS. In Milllion



Source: Economic Surveys of Various Years, MOF.

Figure 4.1 shows that real government expenditure is increasing almost all the time. This is because as the population growth rate is very high in Nepal, this creates the problem of providing education, health, defence and other public services. Government sector is compelled to make larger investment in infrastructure and other industrial development opportunities to create the employment opportunity for the increasing population and to increase the economic growth of the country. Similarly, supply factor has also increased the government expenditure. The massive investment in the social and economic overheads has been made contiguously to increase productive capacity of the economy. The economy is influenced either by increasing the skill in organizational capacity or by increasing the capital stock in the economy.

Secondly, there is increase in the salary of the government worker every year, but in comparison to increase in salary increase in the productivity of the government worker is lower that creates inflation in the economy. Thus, next year the salary should be increased to compensate the inflation. In this way, there should be increase in the government recurrent expenditure every year. And, hence increase in the government expenditure.

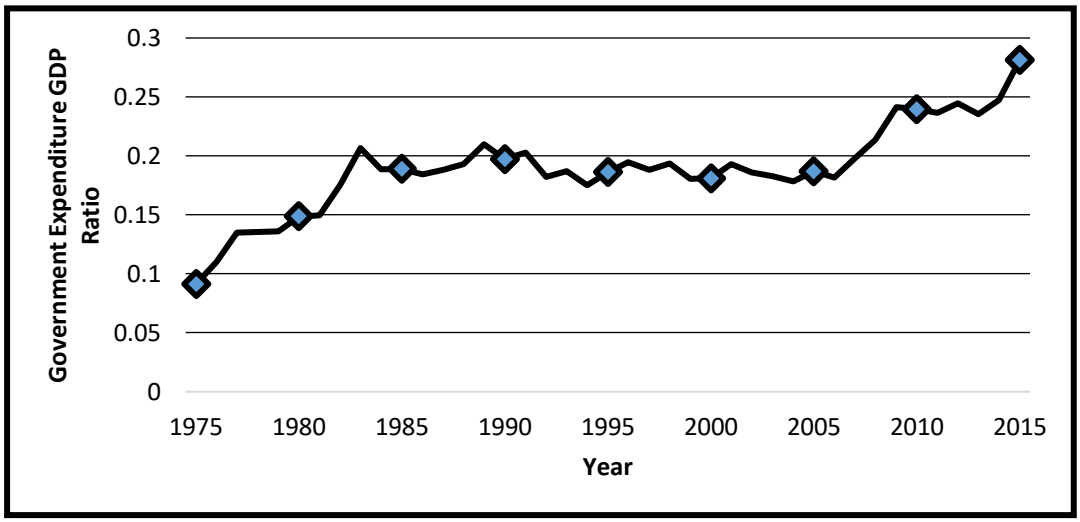
It is clear from the Figure 4.1 that the GDP is increasing over the period of the time. It was decreasing only in the one fiscal year that is the year 2001. This is because of the armed conflict and political fluctuations after the massacre in the palace. Because of that investors aren't attracted to the investment; that results in the decrease in the

employment and economic activity and hence decrease in the RGDP. It is increasing in all other years because of the improvement in the education and health indices people increases the skill and productivity. Thus, that causes increase in the RGDP.

4.1.1. Trend of Ratio of Government Expenditure to GDP

Ratio of government expenditure to GDP has an increasing trend over the time but it was fluctuating in some period of the times. It had increased from 1975 to 1987, it had fluctuated between the 1988 to 2007 and it was increasing thereafter. The trend of ratio of government expenditure to GDP is given in Figure 4.2.

Figure 4.2: Trend of Ratio of Government Expenditure to GDP (GEGR)



Source: Economic Survey of Various Years, MOF.

Figure 4.2 shows that there was increasing trend of the ratio of government expenditure to GDP from 1975 to 1983; after this for around 4 years that is up to 1987 it remains constant. It fluctuated between 17% and 19% until 2007. It was increasing from 2008 to 2015. There is increasing trend in the ratio of government expenditure to GDP in the first stage because at that time government needed more expenditure for the development of infrastructure, education and health; investment on those sectors can have return only in the long run not on the short run. But there was not any public expenditure for the short-term return and not much industry in the private sector were established due to the lack of infrastructure and investment climate that means investment law, lack of technology and lack of motivation to the investment. Hence, at the first period there was increasing trend in the government expenditure but the GDP was increasing in the lower rate than the government

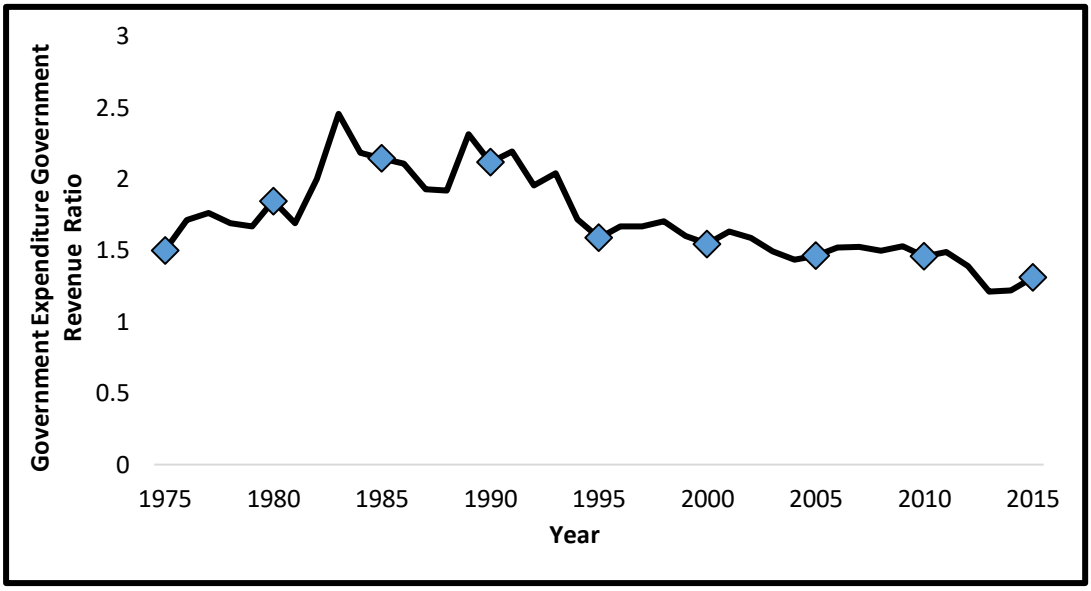
expenditure. Hence, GEGR was increasing. In the second stage, there is somehow constant GEGR because of somehow similar rate of increase in the public expenditure and economic growth. This is because government was increasing expenditure in the development of the infrastructure and at the same time it was started to establish industry from the private sector and the return from the past government expenditure on infrastructure, health and education has started to receive return over it. At the third stage, again there is increasing trend in GEGR. At the last stage government needed more expenditure to complete the peace process, for the reconstruction of the infrastructure after the 10 years' civil war and massive earthquake and due to continuously increasing recurrent expenditure. So, government did not have enough fund to invest in the productive sector that is in the development expenditure and due to the political instability, there is not much investment from the private sector; these has combine negative effect on the GDP growth rate. Hence, in the last stage there is increasing trend in GEGR.

In case of Nepal, Government Expenditure GDP ratio is increasing over the period. Currently it is equal to the 28%. This is the good sign for the Country, Nepal being undeveloped country it will be better if the government expenditure GDP ratio will be somewhere near to 40%. Thus, there is still need of the increase of the government expenditure GDP ratio for the economic growth of the country.

4.1.2. Trend of Government Expenditure to Government Revenue

Ratio of government expenditure to government revenue was increasing in the beginning. In the second stage it was fluctuated for almost one and half decade and decreased thereafter. This is because government has increased its capacity to collect government revenue faster than its expenditure needs. Government has increased its capacity to collect tax by the increase in the tax base and tax rate in the different time period. The trend of government expenditure to government revenue is given in Figure 4.3.

Figure 4.3: Trend of Ratio of Government Expenditure to Government Revenue (GERR)



Source: Economic Surveys of Various Years, MOF.

Figure 4.3 shows that there was increasing trend of the ratio of government expenditure to government revenue (GERR) from 1975 to 1977; after this for around 2 years that is up to 1978 it was decreased. At that stage, it was increasing due to need of higher public expenditure in the development of infrastructure, to improve the education and health condition in the society; but the method of revenue collection at that time hadn't been advanced and the most of the sources of the revenue had not identified. It fluctuated between 1.65 and 2.45 until 1993. In that stage government started to advance the method of collection of taxation and government has identified different sources of revenue. Since, it was started for the first time there was not advance method to monitor it because of this there arises the problem of tax evasion in some of the years. Hence, it was fluctuated over the time. It has decreasing trend from 1993 to 2012. This is because government introduced different taxation in the various tax base and advanced the method of collection of taxation and method to monitoring and evaluating it. GERR has increased from 2013 to 2015. Because, due to the unstable government and the weak policy economic activities cannot take place in the country. So, only little amount of taxation was collected. On the other hand, at that period government need higher amount of expenditure for finishing peace process and for reconstruction of the state to enter in

to the federal system. There is fluctuation in the GE/GR over the time due to the changing growth rate of the public expenditure and public revenue.

Real public expenditure has been increasing from the Panchayat to democracy and from democracy to republic system. Similarly, the ratio of government expenditure to GDP was also increasing from Panchayat to democracy and from democracy to republic system. On the other hand, the ratio of government expenditure to the government revenue has been decreasing from Panchayat to democracy and from democracy to republic. This is given in Table 4.1.

Table 4.1: Trend of public expenditure (Average in Panchayat, Democracy and Republican system)

Regime	RGE (Rs. In million)	GEGR	GERR
Panchayat (1975-1991)	3233.99	0.17	1.96
Democracy (1992-2006)	6888.78	0.19	1.64
Republic (2007-2015)	14876.2	0.24	1.40
Overall Average	8,332.99	0.20	1.66

Source: Economic Surveys of Various Years, MOF.

The Table 4.1 shows the trend of public expenditure, ratio of Public expenditure to GDP and ratio of public expenditure to government revenue from 1975 to 2015; in the different system of the government in country. Namely, Panchayat regime from 1975 to 1991, under the democratic regime from 1992 to 2006 and in the republican regime from 2007 to 2015. All the expenditures adjusted through the application of consumer price index (CPI). All the values presented in the table reflects the average valuesover the period of each system of the government. The real values are given in the appendix. From the table, it is clear that average real expenditure in democratic system is higher than that of Panchayat system and the real expenditure in republican system is higher than that of democratic system. This is because the democratic government increases the number of the government worker and in that period, there is high increase in the salary of the government worker. On the other hand, almost with the beginning of the democratic government era armed conflict was started and government need to increase expenditure to maintain the peace and security. Hence, the government expenditure is higher in the democratic system of the government than in the panchayat system. Republican system is still in the transitional period, there wasthe problem of finishing peace process, reconstruction of the state,

equitable distribution of the resources and at the later stages there is the need of reconstruction after the massive earthquake. For thesegovernment, should increase the public expenditure both in the current expenditure and capital expenditure. And, same as in the democratic government era republican government has been increasing the salaries of the government worker in the huge amount thus it increases the government expenditure than in the republican era than in the democratic era. Hence The overall average of the RGE in all regime is RS. 8,332.99 which is higher than the average in the Panchayat and democratic regime but less than that of the republican regime. Hence, the public expenditure in the republican system is higher than that of democratic system.

Also, ratio of real government expenditure to real GDP (GEGR) is also increasing from panchayat to democracy and from democracy to republican system. In the Panchayat period, there is lesser requirement of the public expenditure in the recurrent expenditure which is unproductive government expenditure and higher share in the development expenditure which is the productive sector. Hence, GEGR is lower in the Panchayat system. But, in the democratic system government needed to increase public expenditure for maintain the peace in the society and higher amount of the salaries should be given to the increased number of the government satff but due to the unstable government new industries didn't open form the private sector, public industries started to shut down due to the privatization, thus are lesser economic activities. Hence, GDP growth rate is lower than that of the growth rate of the public expenditure. Thus, in democratic system GEGR is higher than that of panchayat system. In the republican system, due to the political instability and transitional period new industries hasn't started. On the other hand, existing industries also cannot perform well due to the political strike, labour strike, and political instability. This has negative impact on the GDP growth rate. But, to finish the peace process, for the reconstruction of the state to the federal state and reconstruction of the country after armed conflict and the massive earthquake government needs more expenditure. Thus, it is higher than in both the Panchayat and democratic regime.The overall average of the GEGR in all regime is 0.20 which is higher than the average in the Panchayat and democratic regime but less than that of the republican regime. Hence, GEGR in republican system is higher than that of the democratic regime and GEGR in the democratic regime is higher than that of the Panchayat regime.

On the Other hand, the ratio of public expenditure to government revenue is decreasing from panchayat regime to democratic regime and from democratic regime to republican regime. This is because the rate of growth of public revenue is higher than growth rate of public expenditure on all regime. Since, government has advanced the method of collection of taxation and increased the tax base.The overall average of the government expenditure government revenue ratio in all regime is 1.66 which is lower than the average in the Panchayat and democratic regime but higher than that of the republican regime. This shows that the government expenditure government revenue ratio was decreasing over the period. It is the good sign for the economy of the country. Since, it is decreasing the dependency of the public debt in the country. By which the dependency with the foreign country will be decreased.

Average of government expenditure is increasing in every 5 years. But, average of the ratio of government expenditure to the GDP and ratio of government expenditure to government revenue was fluctuating almost all the time. It is given in Table 4.2.

Table 4. 2: Trend of Public Expenditure (5 Years Average)

FY	GE (RS. In Million)	GEGR	GERR
1975-1979	1900.60	0.12	1.67
1980- 1984	2921.81	0.17	2.04
1985-1989	4089.36	0.19	2.08
1990-1994	4089.36	0.19	2.01
1995-1999	6325.32	0.19	1.65
2000-2004	7664.89	0.18	1.54
2005-2009	10482.59	0.20	1.51
2010-2015*	16491.53	0.25	1.35
Overall Average	6,745.68	0.18	1.73

Source: Economic Surveys of Various Years, MOF.
*For this period average of 6 years is taken.

The Table 4.2 shows the trend of public expenditure, ratio of public expenditure to GDP and ratio of government expenditure to government revenue from 1975 to 2015 as an average of 5 years. Here, 5 years is taken because the most of the development planning are 5-year planning. All the expenditure adjusted through the application of consumer price index and kept in the real term.

Table 4.2 shows the overall average of the government expenditure is RS. 6,745.68 which is higher than the government expenditure from the period 1975 to the period 1995-1999. That shows that the government expenditure is increasing over the study period. Similarly, the overall average of the GEGR is 0.18 which is lower after the period 2000-2004 and before that it was fluctuating. Thus, it can be concluded that the GEGR is also increasing over the period. On the other hand, overall average of the government expenditure government revenue ratio is equal to 1.73 which is lower than that of the period from 1975-1979 to 1990-1994 but higher than after that period. This shows that the government expenditure government revenue ratio is decreasing over the period.

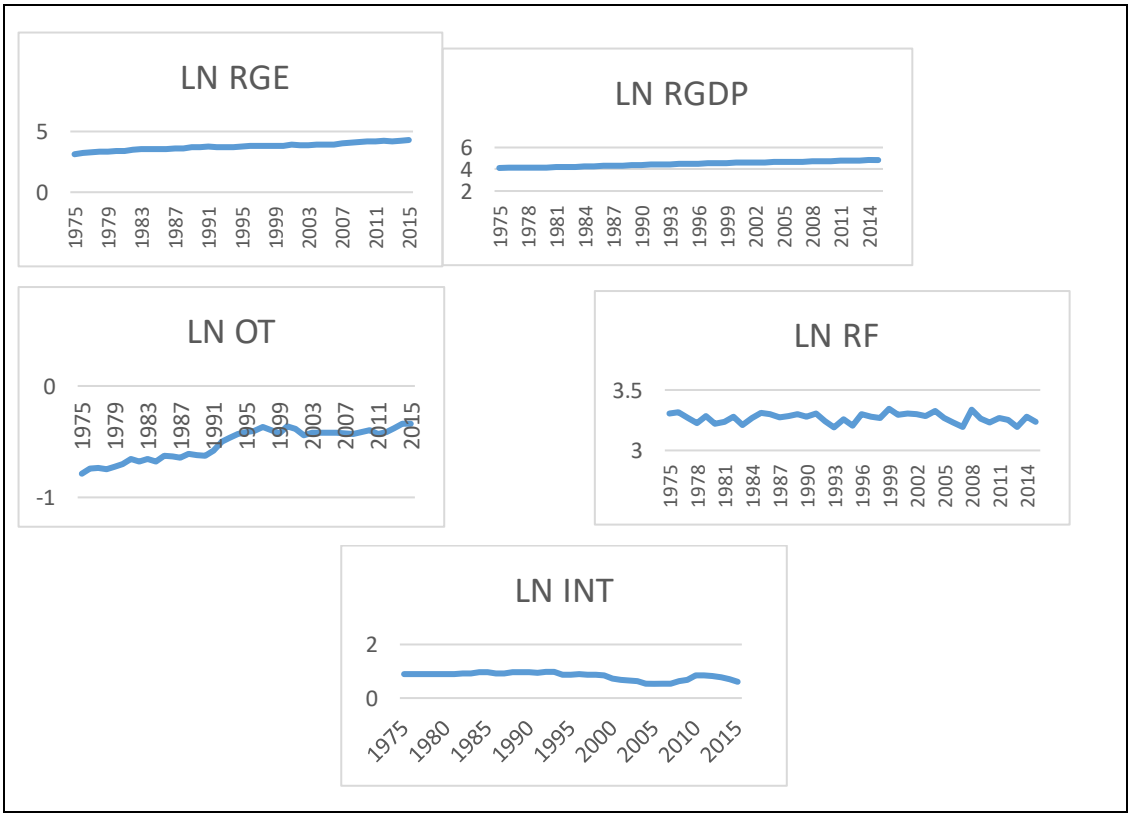
From the table the average real expenditure remained same in the time of 1985-1989 and 1990-1994. Except this in all other time periods average real expenditure is increasing. This is because in each five years' plan government expenditure was increasing since the government is introducing the new program and projects and there is excessive pressure to government for the introduction of the various welfare projects and increase in the recurrent expenditure due to the increase in the number of government worker and increased salary of them from one period to another. Also, GEGR was increasing from 1975-1979 to 1985-1989. It remains constant from 1985-1989 to 1995-1999; and decreased in 2000-2004. GEGR started to increase from 2005-2009. This is because growth rate of government expenditure and GDP do notremain same; sometime growth rate of GDP is higher than that of government expenditure and vice versa. On the other hand, GERR remained fluctuated over the time. In the beginning, it was increased from 1975-1979 to 1985 -1989. After this it started to decrease and continue to 2015. This is because in the first five years the method of collection of taxation was not advanced and there were less number of tax bases but at that time there were higher need of the public expenditure to invest in the infrastructure, education, health and other social welfare project. Thus, in the first five years GERR was increasing. But, in the later decades government improved the method of collection of taxation and it has increased the base of taxation. It results government revenue grow faster than the government expenditure. Hence, GERR was decreasing in the later years.

4.2. Relationship between Public Expenditure and Economic Growth

Both public expenditure and economic growth are the time series data. Thus, before checking the long run and short run relationship between the public expenditure and economic growth it is necessary to check order of integration of the variable. Before testing the stationary of the data, it is better to see the nature of the data. Nature of data is given in Figure 4.4.

Figure 4.4 shows the graphical representation of each time series variables that are used in the study in their natural logarithm form. In figure, LN RGDP, LN RGE, LN OT, LN RGR and LN RDD are non-stationary data because each of them has increasing trend over time. Variables LN GFCF, LN RF, LN RFD and LN GGR seems to be stationary as they are fluctuating over the period. The figure only helps to show the general properties of time series data. Now, it is necessary to test the stationary of the data by using the econometric tools. In this study uses ADF test to test the unit root of the data, i.e.; to test the stationary of the data.

Figure 4.4: Multiple Graphs of LNRGE, LN RGDP, LN RF, LNOT, LNRFD, LNRDD, LNRGFCF and LNGGR



Source: Authors calculation through Excel and E-views.

Unit root test of the variables has been done through ADF test. The result of the ADF test can be shown in the Table 4.3.

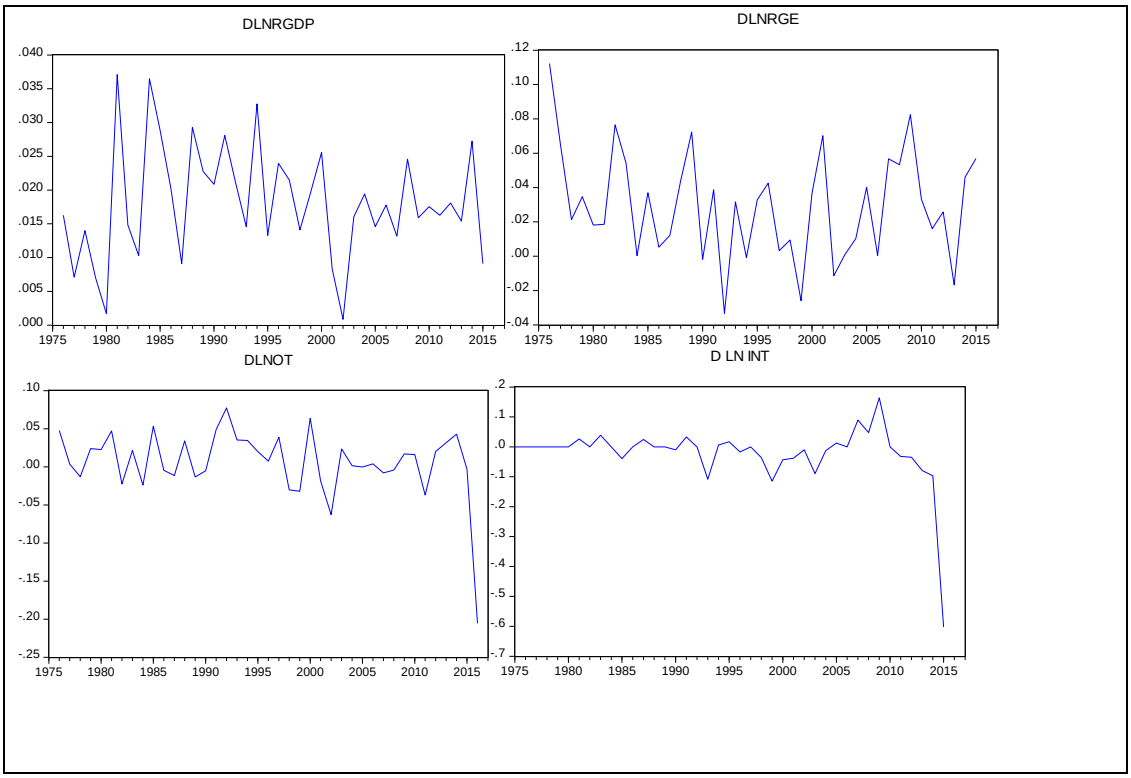
Table 4.3: Identification of Order of Integration

Variables	Level		First Difference		Remarks
	Intercept	Intercept and Trend	Intercept	Intercept and Trend	
LN RGDP	-0.291 (3.6055)	-1.492 (3.526)	6.333* (-2.9389)	-6.247* (-3.5297)	I (1)
LN RGE	-1.346 (-2.9369)	-3.391 (-3.5266)	-6.268* (-2.9389)	-6.090* (-3.5297)	I (1)
LN INT	-1.1604 (-2.9389)	-2.3849 (-3.5297)	-3.8651* (-2.9389)	-3.8668* (-3.5297)	I (1)
LN RF	-5.380* (-2.9369)	-5.325* (-3.5266)	-7.873* (-2.9411)	-7.758* (-3.5330)	I(0)
LN OT	-2.007 (-2.9350)	-0.714 (-3.5236)	-3.9807* (-2.9369)	-4.112* (-3.529)	I (1)

Source: Author's calculation through E-views
*represents stationary at 5% level of significance.

The Table 4.3 shows the result of the ADF t- statistics of the concerned variables that are used in the study. If each of the variables are found significant at their level then that variables are known as I (0), and if each of the given variables are found significant at their first difference then the variables are known as I (1). In the above figure, only LN RF, LN RFD and LN GGR are found to be stationary in the level form. Similarly, LN RGDP, LN RGE, LN OT, LN GRGR, LN INT and LN RDD are found to be stationary at first difference. All the variables are significant at less than 5% level of significance. The graph of the variables that becomes stationary at first difference is given in Figure 4.5.

Figure 4.5: Multiple Graphs of D (LN RGDP), D (LN RGE), D(LN OT), D(LN RGR)and D(LN RDD)

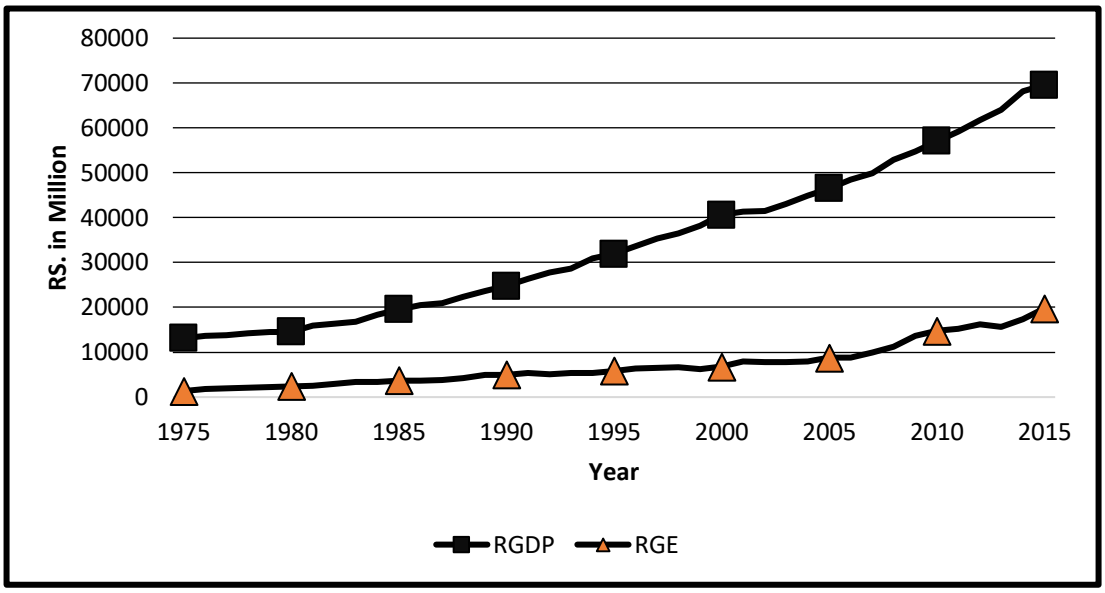


Sources: Author's Calculation through E-views.

4.2.1. Graphical Representation between Public Expenditure and Economic Growth

By the simple descriptive analysis based on the table given in the annex, there is relationship between the economic growth and public expenditure. Both are the time series data having the increasing trend but RGDP is increasing in the increasing rate and RGE is increasing in the constant rate up to a certain stage and after that it is also increasing in the increasing rate. Relationship between the public expenditure and economic growth is given in Figure 4.6 by plotting RGDP and RGE.

Figure 4.6: Graphical Representation between Public Expenditure and Real GDP

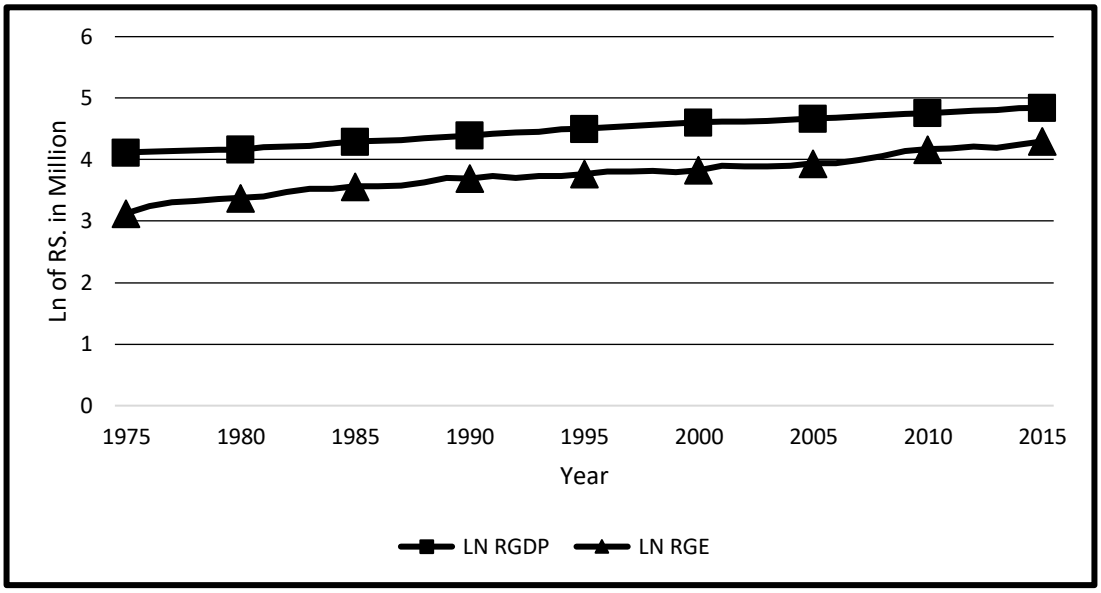


Source: Economic Survey 2010/11, 2012/13 and 2015/16, Ministry of finance.

From the Figure 4.6both the RGDP and RGE are showing increasing trend over the study period. From 1974/75 to 1988/89 RGE is increasing slowly and there cannot be seen any fluctuation in the data. But, in the same period RGDP is growing at faster rate than RGE and in the process of growth two small fluctuation can be seen. From 1988/89 to 2001/02 there RGDP is growing much faster than the previous period this is because after the restoration of the democracy in 1990 there is increase in the economic activities and new industries were started to open. Also, from 1988/89 to 2001/02 RGE is increased in an increasing rate. After this, till 2014/15 RGDP is growing rapidly in comparison to the previous period; there is only one fluctuation in the RGDP. Also, in that period RGE is growing faster than the previous period; but there are few fluctuations in RGE from 2001/02 to 2014/15.

From the table given in the annex, that shows the data for LN RGDP and LN RGE; there is strong correlation between these variables. They are moving almost in the same direction in each state. The relationship between LN RGDP and LN RGE is given in Figure 4.7.

Figure 4.7: Graphical Representation between LN RGDP and LN RGE



Source: Author's Calculation through Excel

Figure 4.7 shows that there is strong correlation between the LN RGDP and LN RGE. They move together from the beginning almost being parallel. In the beginning from 1974/75 to 1980/81 gap between them seems to be higher and it started to decrease in the 1982/83. Gap between them is in 2008/09. The overall trend for both LN RGDP and LN RGE is they move together being parallel to each other.

4.2.2 Autoregressive Distributed Lag (ARDL) Model to Cointegration

The ARDL approach tests the null hypothesis that there is no long run relationship among the variables. It can be done by the bound testing approach. Bound testing approach uses the standard version of F-test. This test helps us to identify whether all variables which are used in this work has long run correlation or not. The maximum number of lag for both the dependent and independent variable is selected by using the AIC and SBC criterion. From the appendix both the AIC and SBC value is minimum when the maximum lag of both dependent and independent variables is 3. By taking the above-mentioned lag for both of the variables ARDL (1,1,2,1,0) is selected.The result of the bound test is given in Table 4.4.

Table 4.4: Estimation of Bound test for ARDL (1,1,2,1,0) Cointegration Model

Level of Significance	F- statistics	Lower Bound	Upper Bound
1%	26.2424	3.29	4.37
5%		2.56	3.49
10%		2.2	3.09

Source: Author's Calculation through E-views

In the Table 4.4 the calculated F-statistics is 26.2424 which is higher than both the lower bound and upper bound values in all level of significance. This shows that the rejection of null hypothesis of the hypothesis 3.11.1 that there is no long run relationship among the variables. In other words, there is long run relationship among the variables. Thus, the concerned variables are cointegrated.

To estimate the ARDL equation lag length of each variable must be identified. This research work prefers AIC criterion for this purpose. AIC criterion has selected the lag length (1,1,2,1,0) and applied on the ARDL model and ECM model. AIC criterion has selected the lag length (1,1,2,1,0) which explains that LN RGDP, LN RGE and LOT are regressed with one lag ,LN RFis regressed with two lag and LN INT is regressed with zero lag.

The details of the ARDL model is given in Table 4.5.

Table 4.5: Coefficient of Long Run Relationship in the ARDL(1,1,2,1,0) Cointegration Form

Dependent Variable is LN RGDP				
Repressors	Coefficient	Standard Error	t-ratio	p-value
LN RGE	0.4150*	0.0494	12.4333	0.0000
LN RF	0.3392	0.2503	1.3550	0.1859
LN OT	0.3339*	0.1023	3.2620	0.0028
LN INT	-0.1154**	0.0633	-1.8230	0.0786
C	1.4200	0.8993	1.5790	0.1252
R- Squared	0.8999	Adjusted R-squared	0.8999	

Source: Author's Calculation through E- views
*Shows level of significant at 1% level
**Shows level of significant at 10% level

Table 4.5 shows that the LN RGE, LN RF and LN OT have positive relationship with LN RGDP and both LN RGE and LN OT are significant at less than 1% level of significance but LN RF has not significance relationship with LN RGDP. Thus, there positive relationship between the LN RGDP and LN RGE and LN OT in long run. But, there is not long run relationship between LN RGDP and LN RF. But, LN INT has negative relationship with LN RGDP and it is significant with less than 10% level of significance. Hence, there is negative relationship between the LN RGDP and LN RGE in long run. That implies 1% increase in LN RGE and LNOT causes to increase LN RGDP by 0.41% and 0.33% respectively. Similarly, 1% decrease in LN INT causes to increase LN RGDP 0.11%. This has rationality because increase in RGE in long run helps to increase the economic activity in the country, to reduce the unemployment and to improve the condition of the poverty and inequality and all of them has positive impact on the GDP of the country. Also, openness of trade can be increased only when share of sum of export and import is higher in GDP.By the increase in the trade there are different opportunities in the economy of the country that helps to increase the employment in the country and ultimately will increase in the aggregate demand for goods and services and contribute to the GDP.Rainfall has only the short run impact in the agricultural productivity that means rainfall of the current year has impact on the agricultural production of only the current year it cannot affect the production of future. Thus, it is insignificant in case of the long run economic growth. On the other hand, LN INT has negative relationship with LN RGDP and it is significant with less than ten percent level of significance. It is totally meaningful since the increase in the interest rate has negative effect in the investment and investment has the positive impact on GDP. Thus, LN RGDP has negative relationship with LN INT. R- squared and adjusted R-squared test shows that there is overall significance of the model and the 89% variation in the LN RGDP can be explained by the LN RGE, LN RF, LN OT and LNINT.

Table 4.5 is based on the following cointegration equation.

D(LN_RGDP) = 0.020497208070*D(LN_RGE) + 0.096762870314*D(LN_RF) - 0.040229740232*D(LN_RF(-1)) + 0.175333825763*D(LN_OT) - 0.013426432559*(LN_RGDP - (0.61507438*LN_RGE(-1) + 0.33921717*LN_RF(-1) + 0.33391643*LN_OT(-1) -0.11544087*LN_INT(-1) + 1.42006686) - 0.174226690112*CointEq(-1))

4.2.3. Error Correction Version of ARDL Model

To check the short run relationship among the variables ECM model is used; that is derived from the ARDL model. The error correction from of the calculated equation can be written as

The details of ECM model is given in Table 4.6.

Table 4.6: Coefficient in Short Run Relationship in the ARDL (1,1,2,1,0) Cointegration Form

Dependent Variable is LN RGDP				
Regressor	Coefficient	Standard Error	t-ratio	p-value
Δ LN RGE	0.2049*	0.0308	0.6637	0.0172
Δ LN RF	0.0967*	0.0207	4.6702	0.0001
Δ LN OT	0.1753*	0.0315	5.5503	0.0000
Δ LN INT	-0.0134	0.0191	-0.7019	0.4883
ECT (-1)	-0.1742*	0.0131	-13.2203	0.0000
R^2 = 0.899 $R^2{}_{adj}$ = 0.899 F =5206.907S.E. = 0.0061 DW= 1.9470 AIC= -7.1140				

Source: Author's Calculation through E- views
*Shows significant at 1% level of significance

Table 4.6 presents the result for short term error correction model for LN RGDP. The coefficient of the error correction term is negative and statistically significant, indicating the evidence of cointegration among the LN RGDP and other variables in the model. The comparatively lower value of the error correction term for LN RGDP implies relatively lower rate of adjustment in LN RGDP when shocks arise. The coefficient of error correction term (i.e.; -0.1742) implies that about 17% of total adjustment takes annually when shock arises. It can be seen from the table that the difference of LN RGE, LN RF and LN OT has positive relationship with LN RGDP and all of them are significant at 1% level of significance. Form the table increase in LN RGE, LN RF and LN OT by 1% causes to increase in LN RGDP by 0.20 %. 0.09% and 0.17 % respectively. This is because government expenditure has effect in an economy through two ways one is by the increase in the recurrent expenditure it helps to increase in the aggregate demand of the economy and hence increase in the GDP. On the other hand, by the increase in the capital expenditure it helps to improve the level of production technology and helps to produce human capital in an economy and thereby increase in the GDP of the country. Also, by increase in the

rainfall it helps to increase in the agricultural productivity and hence increase in the agricultural GDP and hence increase in the GDP of the country. Increase in OT means the increase in the trade volume of the country and that helps to create the employment opportunity and increase the aggregate demand and hence increase in GDP of the country.

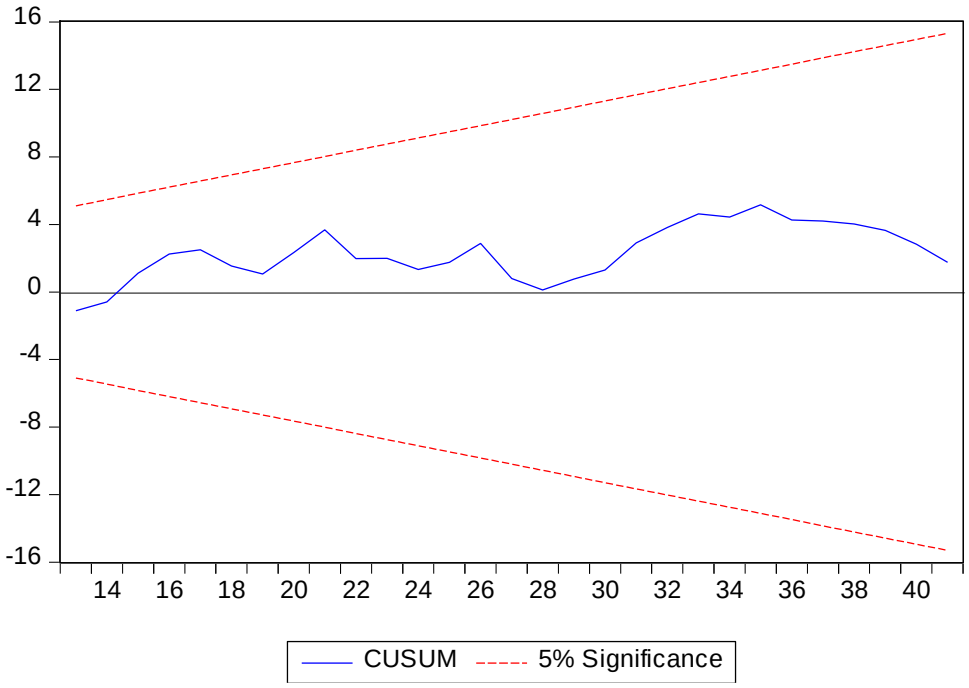
Table 4.6 is based on the following equation, which is the error correction transformation of cointegration equation.

ECT = 0.013426432559*(LN_RGDP) - 0.61507438*LN_RGE (-1) + 0.33921717*LN_RF(-1) + 0.33391643*LN_OT(-1) -0.11544087*LN_INT(-1) + 1.42006686.

4.2.4. Stability Test

The stability of the long -run parameters together with short run movements for the estimated equations should be examined. For this the thesis relied on cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) tests proposed by Borensztein et al. (1998). The test applies to the residuals of the ECM. The graphical presentation of CUSUM test is given in Figure 4.8.

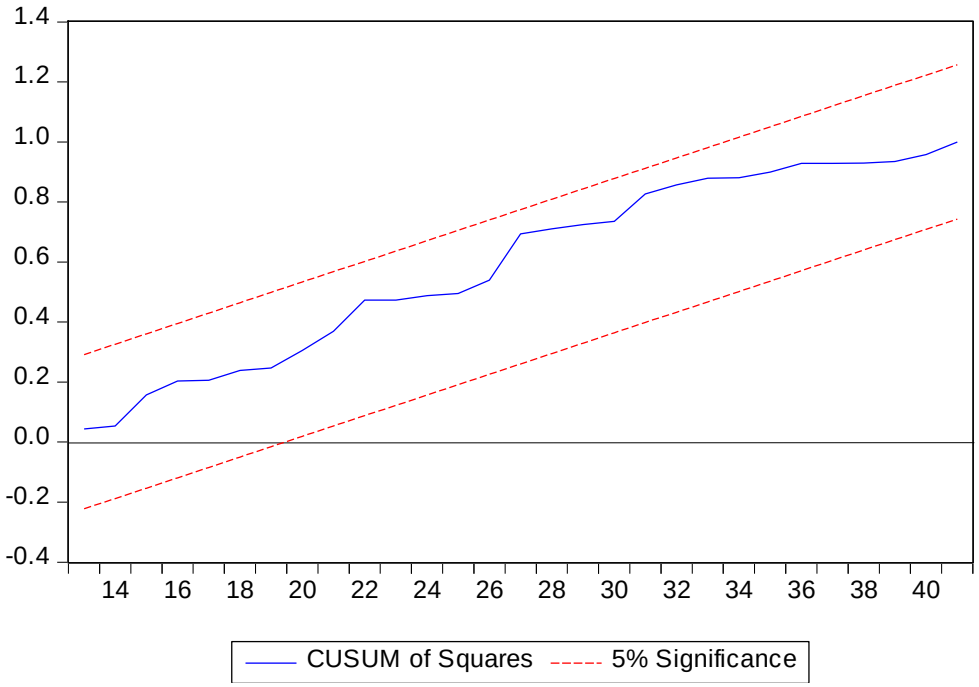
Figure 4.8: Cumulative Sum of Recursive Residuals (RGDP)



Source: Author's Calculation through E-views

Since, the plots of CUSUM statistic for LN RGDP are within the critical lines at the 5% significance level, long run coefficient of the RGDP function is stable. Similarly, the graphical representation of the CUSUMSQ is given in Figure 4.9.

Figure 4.9: Cumulative Sum of Square of Recursive Residuals (RGDP)



Source: Author's Calculation through E-views.

Since, the plots of CUSUM statistic for LN RGDP are within the critical lines at the 5% significance level, long run coefficient of the RGDP function is stable. The result for the test of serial correlation is given in Table 4.7.

Table 4.7: Test of Serial Correlation

Null Hypothesis: There is serial autocorrelation Alternative Hypothesis: There is no serial autocorrelation		
Lag length	F- Statistics	Chi- square
1	0.9392	0.9276
2	0.2824	0.1729
3	0.4781	0.3218
4	0.5265	0.3416

Source: Author's Calculation through E-views

From the Table 4.7 the p-value is higher than 0.10 in each lag length that shows the rejection of the null hypothesis at 10% level of significance. Thus, there is no serial correlation in the model.

The value of the Jarque – Bera probability test is 0.6315that rejects the null hypothesis for the normality test (i.e; the data is not normally distributed). Hence, the data is normally distributed. Chi -square value for the Breusch -Pagan- Godfrey test is 0.7443 that shows the rejection of the null hypothesis of heteroscedasticity test (i.e; there is heteroscedasticity). Hence, there is homoscedasticity in the data.

4.3. Causal Relationship between Public Expenditure and Economic Growth

Pair wise Granger Causality test has been used to check the causality between the public expenditure and economic growth. Since, both variables RGE and RGDP are I (1) variable so, the causality can be checked only in the first difference of both variables. This study has chosen the Schwarz criterion for the causality between the RGE and RGDP. Table 4.12 shows the result for the pair wise Granger causality test between public expenditure and economic growth.

Table 4.12: Results of Pair Wise Granger Causality Test (Data in First Difference)

Sample: 39 (1975-2015)				
Lags: 1				
Null Hypothesis	Observation	F-statistics	probability	Decision
LNRGDP doesnot Granger cause LNRGE	39	3.6596*	0.0364	Reject
LNRGE doesnot Granger cause LNRGDP	39	4.6919*	0.0159	Reject

*Value shows reject of the null hypothesis at 5% level of significance.

The Table 4.12 shows result of pair wise Granger causality test between RGE and RGDP in the first difference. Taking lag 1it can be concluded that there is bidirectional causality between RGE and RGDP. The F-statistics for both GDP Granger causes GE is significant and GE Granger Causes GDP are significant at 5% level of significance. It can be concluded that GDP Granger causes GE and similarly GE Granger causes GDP. This shows that the rejection of the null hypothesis of the null hypothesis of 14.1.1.

CHAPTER V

SUMMARYOF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

Economists always have different arguments weather the public spending brings the positive or negative effect in the economy. This debate turned back to the Classical economists who are the supporters of the free economy without government intervention and Keynesian economists who are the supporters of the government intervention in the economy. This debate still in the exist in the current economy in the form of the new Classical economics and the new Keynesian economics. Thus, this study has tried to find out the effect of the public expenditure in the economic growth in case of Nepal.

It has used descriptive analysis to check the nature and trend of the public expenditure and economic in Nepal. It has used real government expenditure and real GDP for the analysis. Real GDP is taken as the independent variable and government expenditure is taken as the independent variable to find out the relationship between public expenditure and economic growth. Average annual rainfall(RF), openness of trade (OT) and interest rate (INT) has been used as the control variable. The Study has used the ARDL and ECM model to check the existence of the long run and short run relationship among economic growth and public expenditure respectively after checking the unit root of the concerned variables. It employed the CUSUM and CUSUM of square to test the stability of long run coefficient in the model and used the LM test to check the serial correlation in the model. Similarly, it has used Breusch- Pagan-Godfrey test to check the existence of the heteroscedasticity and employed normality test to check the normality of the data. Granger Causality test has been used to check the causal relationship between the public expenditure and economic growth in the country.

The nature and trend of both public expenditure and economic growth is found increasing in the study period. It found there is positive and significant relationship between the Public expenditure and economic growth both in short run and long run. Similarly, openness of trade and rainfall have positive and significant relationship

with GDP in short run. Openness of trade has positive and significant relationship with GDP in the long run but interest rate has negative and significant relationship in long run. Rainfall is found to be insignificant in long run and interest rate is found to be insignificant in short run.

5.2. Conclusions

The following conclusions are made based on thesis.

i. There is increasing trend and nature of the public expenditure throughout the study period. This is because in the beginning of the panchayat regime government continuously increases expenditure in building infrastructure, public enterprises and other development activities. Democratic government keeps on increasing the salary of its worker and that government must put more money on the army and police to maintain peace and security in the society due to the insurgency in the country. On the other hand, after the establishment of the republican system government need huge amount of the money to finish the peace process, transition era and to do election. Thus, government expenditure is increasing throughout the time.

ii. There is increasing trend and nature of the GDP throughout the study period. This is because in the panchayat regime there were development in the infrastructure, education and health system in the country that helps to increase the overall income of the people. On the other hand, due to the increase of inclusiveness in the democratic and republican regime larger group of the people have access to the education, health and transportation facility that helps to increase the income of the people. That results in the increase of the GDP of the country.

iii. Positive relationship between the public expenditure and economic growth has been found. Increase in the government expenditure helps to increase the salary of the government workers that helps to increase the aggregate demand in an economy and hence increase in the production. On the other hand, government expenditure helps to build up infrastructure, to reduce the poverty and to increase the access of the education and health to the common people of the country. Those activities directly or indirectly increase the skill of the common people and hence increase in the income of the common people.

iv. Bidirectional causality between the public expenditure and economic growth has been found. Increase in public expenditure helps to increase the economic growth through the process of multiplier. On the other hand, increase in the economic growth increases the revenue and responsibility of the government and both causes to increase in the government expenditure.

5.3. Recommendations

Following recommendations are made through the thesis.

i. Economic growth should be higher than that of current situation and and share of development expenditure should be higher in the government expenditure that is helpful in the increase of productivity of the labour in the country.

ii. Excessive increase in the recurrent expenditure should be minimized that helps to control the inflation and helps to increase the real GDP.

iii. Policy makers should be focused in increasing government expenditure by increasing in public expenditure that helps to increase in the economic growth. It is better to increase the capital expenditure than the recurrent expenditure.

iv. Increasing openness of trade also helps to increase in the GDP of the country by increasing the income and employment opportunity in the country. It is better to increase in the export than in the import. For this government, should provide subsidy and tax exemption policy for the export oriented industries and need to attract FDI in the export oriented industries.

v. Government should cooperate with the NRB to decrease interest rate by using various financial tools for example by increasing money supply that helps to increases in the investment and helps to increase the GDP in long run

vi. Government should focus on the building of the irrigation projects for the farmers that helps to decrease in the dependency of rainfall and ultimately increases the agricultural GDP, which is a part of the GDP.

vii. Government should take two way advantages from the increase in the public expenditure and economic growth. That means government can take the help of government expenditure to increase the economic growth rate and increase in economic growth helps to increase in the government expenditure. But, it should try to maintain the higher economic growth rate than the growth rate of public expenditure.

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APPENDIX A

Concerned Variables in Nominal Form (All Variable Except RF, GGR, INT and OT is in RS. Million, RF is in Millimetre, GGR and INT are Percentage and OT is Ratio)

Year	GE	GDP	GR	FD	DD	INT	RF		OT
1975	151.37	1657.1	100.84	10.4	10	8	2023.28		0.16318
1976	191.33	1739.4	111.56	14.59	20	8	2081.92	3.8	0.18210
1977	233.04	1728	132.29	16.43	30	8	1862.12	1.7	0.18360
1978	267.49	1973.2	158.2	38.18	24	8	1675.60	3.2	0.17817
1979	302.05	2221.5	181.19	39.02	20	8	1915.67	1.6	0.18822
1980	347.07	2335.1	188	53.49	18	8	1653.89	0.3	0.19830
1981	409.23	2730.7	241.92	69.33	25	8	1725.52	8.9	0.22107
1982	536.13	3058.8	267.95	72.99	50	8.5	1889.48	4.8	0.20994
1983	697.92	3376.1	284.16	98.58	100	8.5	1627.02	1.1	0.22055
1984	743.73	3939	340.93	167.09	157.68	9.3	1866.18	8.8	0.20863
1985	839.48	4444.1	391.66	175.49	179.99	9.3	2048.10	6.9	0.23587
1986	979.71	5321.5	464.45	250.11	140.34	8.5	1992.56	4.8	0.23338
1987	1151.3	6114	597.51	270.58	164.47	8.5	1876.82	2.1	0.22729
1988	1410.5	7317	735.04	381.58	113	9	1933.67	7.1	0.24578
1989	1800.5	8583.1	777.69	566.64	133	9	1990.01	5.4	0.23836
1990	1966.9	9970.2	928.75	595.96	215	9	1890.61	4.9	0.23551
1991	2354.9	11612.7	1072.99	625.67	455.27	8.8	2020.52	6.7	0.26362
1992	2641.8	14493.3	1351.27	681.69	207.88	9.5	1752.7	4.9	0.31494
1993	3089.7	16535	1514.84	692.09	162	9.5	1550.91	3.5	0.34153
1994	3359.7	19159.6	1958.08	916.36	182	7.4	1805.79	7.9	0.36986
1995	3906	20997.6	2457.52	731.23	190	7.5	1611.02	3	0.38727
1996	4654.2	23938.8	2789.31	946.39	220	7.8	2004.76	5.7	0.39407
1997	5072.3	26957	3037.35	904.36	300	7.5	1902.09	5	0.43101
1998	5611.8	28979.8	3293.79	1105.4	340	7.5	1855.69	3.4	0.40205
1999	5957.9	33001.8	3725.1	1185.2	471	6.9	2209.68	4.6	0.37331
2000	6627.2	36625.1	4289.38	1181.2	550	5.3	1976.11	6.1	0.43229
2001	7983.5	41342.8	4889.36	1204.4	700	4.8	2012.72	1.93	0.41444
2002	8007.2	43039.6	5044.55	769.87	800	4.4	2003.27	0.2	0.35858
2003	8400.6	46032.5	5622.98	454.64	888	4.3	1922.69	3.8	0.37860
2004	8944.2	50069.9	6233.1	762.9	560.78	3.5	2123.74	4.4	0.37984
2005	10256.	54848.5	7012.27	926.61	893.81	3.4	1865.94	3.2	0.37955
2006	11088.	61111.8	7288.21	821.43	1183.4	3.5	1694.57	3.7	0.38292
2007	13360.	67585.9	8771.21	1005.3	1789.2	3.5	1572.95	2.8	0.37593
2008	16134.	75525.7	10762.2	897.99	2049.6	4.3	2177.09	5.8	0.37232
2009	21966.	90952.8	14347.4	996.89	1841.7	4.8	1842.61	3.9	0.38719
2010	25968.	108341.	17799.0	1122.3	2991.4	7	1703.17	4.3	0.40165
2011	29536.	124848.	19837.6	1207.5	4251.5	7	1849.16	3.9	0.36885
2012	33916.	138748.	24437.4	1108.3	3641.8	6.5	1796.63	4.6	0.38626
2013	35863.	152522.	29602.1	1196.9	1904.3	6	1565.17	3.8	0.41545
2014	43505.	175873.	35662	2113.2	1998.2	5	1901.72	5.7	0.45848
2015	53155.	188941	40586.6	2043.2	4236.7	4	1727.41	2.32	0.45517

Source: Economic Survey 2010/11, 2013/14 and 2014/15.

APPENDIX B

Concerned Variables in Real Form (RGDP and RGE is in RS. Million and GEGR and GERR are Ratios)

Year	Deflator	NEW CPI	RGDP	RGE	RGR	RGFCF	RFD	RDD	GERR	GEGR
1975	12.64	11.29	13109.97	1340.71	893.15	1968.94	92.11	88.57	1.50	0.09
1976	12.78	11.02	13610.33	1735.97	1012.20	2216.58	132.38	181.46	1.72	0.11
1977	12.49	11.56	13835.07	2016.07	1144.46	2232.00	142.14	259.53	1.76	0.13
1978	13.81	12.63	14288.20	2117.15	1252.14	2607.17	302.19	189.96	1.69	0.14
1979	15.3	13.17	14519.61	2293.11	1375.56	2477.22	296.23	151.84	1.67	0.14
1980	16.02	14.52	14576.15	2390.93	1295.11	2535.80	368.49	124.00	1.85	0.15
1981	17.2	16.40	15876.16	2495.63	1475.32	2621.69	422.80	152.46	1.69	0.15
1982	18.62	18.01	16427.50	2976.72	1487.72	3034.30	405.26	277.61	2.00	0.18
1983	20.07	20.70	16821.62	3371.77	1372.82	3176.98	476.26	483.12	2.46	0.21
1984	21.53	22.04	18295.40	3373.99	1546.66	3133.42	758.02	715.33	2.18	0.19
1985	22.73	22.85	19551.69	3673.96	1714.09	4107.76	768.03	787.72	2.14	0.19
1986	25.98	26.34	20483.06	3718.90	1763.01	3579.93	949.40	532.72	2.11	0.18
1987	29.23	30.11	20916.87	3824.03	1984.59	3927.59	898.71	546.28	1.93	0.19
1988	32.7	33.33	22376.15	4231.50	2205.12	4024.20	1144.74	339.00	1.92	0.19
1989	36.4	36.02	23579.95	4998.40	2158.96	4550.61	1573.06	369.22	2.32	0.21
1990	40.3	39.52	24739.95	4977.54	2350.31	4302.55	1508.14	544.08	2.12	0.20
1991	44	43.28	26392.50	5441.32	2479.21	5263.45	1445.65	1051.93	2.19	0.20
1992	52.3	52.42	27711.85	5039.78	2577.81	5585.15	1300.45	396.57	1.96	0.18
1993	57.7	56.99	28656.85	5421.67	2658.12	6541.23	1214.42	284.26	2.04	0.19
1994	62	62.10	30902.58	5410.49	3153.27	6768.79	1475.70	293.09	1.72	0.18
1995	65.9	66.94	31862.82	5835.47	3671.48	7226.36	1092.44	283.86	1.59	0.19
1996	71.1	72.31	33669.20	6436.35	3857.34	7755.44	1308.76	304.24	1.67	0.19
1997	76.2	78.23	35376.64	6484.27	3882.80	7771.60	1156.09	383.51	1.67	0.19
1998	79.3	84.68	36544.51	6627.30	3889.81	7720.48	1305.48	401.52	1.70	0.19
1999	86.3	95.43	38240.79	6243.21	3903.49	6839.46	1242.00	493.55	1.60	0.18
2000	90.3	97.58	40559.36	6791.56	4395.73	7514.20	1210.51	563.64	1.55	0.18
2001	100	100.00	41342.80	7983.51	4889.36	8475.06	1204.40	700.00	1.63	0.19
2002	103.9	102.96	41424.06	7777.25	4899.67	8730.76	747.76	777.02	1.59	0.19
2003	107.1	107.80	42980.86	7793.08	5216.33	9098.03	421.76	823.78	1.49	0.18
2004	111.4	112.10	44946.05	7979.05	5560.46	9739.91	680.57	500.26	1.43	0.18
2005	118	117.20	46481.78	8750.57	5982.95	10028.55	790.59	762.61	1.46	0.19
2006	126.2	126.61	48424.56	8758.13	5756.29	10704.44	648.77	934.68	1.52	0.18
2007	135.4	133.87	49915.73	9980.10	6551.99	11454.08	750.98	1336.53	1.52	0.20
2008	142.9824	143.01	52821.68	11282.36	7525.48	12477.77	627.92	1433.21	1.50	0.21
2009	166.0026	161.02	54790.00	13641.78	8910.27	13106.26	619.10	1143.77	1.53	0.24
2010	189.9069	176.34	57049.79	14726.27	10093.39	15021.09	636.45	1696.34	1.46	0.24
2011	210.7967	193.28	59226.83	15281.67	10263.70	15145.42	624.77	2199.70	1.49	0.24
2012	224.7093	209.14	61745.65	16217.26	11684.73	15166.17	529.94	1741.36	1.39	0.24
2013	238.4165	229.84	63972.95	15603.90	12879.51	16662.64	520.76	828.54	1.21	0.24
2014	258.2051	250.81	68113.99	17346.24	14218.93	18421.10	842.57	796.74	1.22	0.25
2015	271.632	268.82	69557.71	19773.81	15098.23	21886.43	760.08	1576.07	1.31	0.28

Source: Economic Survey 2010/11, 2013/14 and 2014/15.

APPENDIX C

Calculation of Openness of Trade (OT)

Year	Export	Import	GDP	OT
1975	88.96	181.46	1657.1	0.163189
1976	118.58	198.17	1739.4	0.182103
1977	116.47	200.8	1728	0.183605
1978	104.62	246.96	1973.2	0.178178
1979	129.68	288.47	2221.5	0.188229
1980	115.05	348.01	2335.1	0.198304
1981	160.87	442.82	2730.7	0.221075
1982	149.15	493.03	3058.8	0.209945
1983	113.2	631.4	3376.1	0.22055
1984	170.39	651.43	3939	0.208637
1985	274.06	774.21	4444.1	0.235879
1986	307.84	934.12	5321.5	0.233385
1987	299.14	1090.52	6114	0.227291
1988	411.45	1386.96	7317	0.245785
1989	419.53	1626.37	8583.1	0.238364
1990	515.62	1832.49	9970.2	0.235513
1991	738.75	2322.65	11612.7	0.263625
1992	1370.65	3194	14493.3	0.314949
1993	1726.65	3920.56	16535	0.341531
1994	1929.34	5157.08	19159.6	0.369863
1995	1763.92	6367.95	20997.6	0.387276
1996	1988.11	7445.45	23938.8	0.39407
1997	2263.65	9355.34	26957	0.431019
1998	2751.35	8900.2	28979.8	0.402058
1999	3567.63	8752.53	33001.8	0.373318
2000	4982.27	10850.49	36625.1	0.432293
2001	5565.41	11568.72	41342.8	0.41444
2002	4694.48	10738.89	43039.6	0.358585
2003	4993.06	12435.21	46032.5	0.378608
2004	5391.07	13627.71	50069.9	0.379845
2005	5870.57	14947.36	54848.5	0.379553
2006	6023.41	17378.03	61111.8	0.382928
2007	5938.31	19469.46	67585.9	0.375933
2008	5926.65	22193.77	75525.7	0.372329
2009	6769.75	28446.96	90952.8	0.387198
2010	6082.4	37433.52	108341.5	0.401655
2011	6433.85	39617.55	124848.2	0.368859
2012	7426.1	46166.77	138748.2	0.38626
2013	7691.71	55674.02	152522.1	0.415453
2014	9199.14	71436.59	175873.8	0.458486
2015	8531.91	77468.41	188941	0.45517

Source: Author's Calculation through Excel.

APPENDIX D

Concerned Variables in Logarithmic Form

Year	LNRGDP	LNRGE	LNRGR	LN INT	LN RFD	LNRDD	LN RF	LNGGR	LN OT
1975	4.117602	3.127333	2.950926	0.90309	1.964327	1.947294	3.306058		-0.78731
1976	4.133869	3.239542	3.005268	0.90309	2.121814	2.258789	3.318465	0.579784	-0.73968
1977	4.140981	3.304505	3.058602	0.90309	2.152712	2.414196	3.270009	0.230449	-0.73611
1978	4.154977	3.325753	3.097652	0.90309	2.480281	2.278656	3.224172	0.50515	-0.74915
1979	4.161955	3.360426	3.138481	0.90309	2.471634	2.181377	3.282321	0.20412	-0.72531
1980	4.163643	3.378566	3.112307	0.90309	2.566422	2.093422	3.218508	-0.52288	-0.70267
1981	4.200746	3.397181	3.168885	0.90309	2.626134	2.183153	3.236922	0.94939	-0.65546
1982	4.215571	3.473738	3.172522	0.929419	2.607732	2.443438	3.276344	0.681241	-0.67789
1983	4.225868	3.527858	3.137615	0.929419	2.677841	2.684052	3.211395	0.041393	-0.65649
1984	4.262342	3.528144	3.189394	0.968483	2.87968	2.854506	3.270956	0.944483	-0.68061
1985	4.291184	3.565134	3.234033	0.968483	2.885376	2.896372	3.311352	0.838849	-0.62731
1986	4.311395	3.570414	3.246256	0.929419	2.977448	2.726498	3.299413	0.681241	-0.63193
1987	4.320497	3.582521	3.29767	0.929419	2.953621	2.737412	3.273423	0.322219	-0.64342
1988	4.349785	3.626494	3.343432	0.954243	3.058707	2.5302	3.286383	0.851258	-0.60944
1989	4.372543	3.698831	3.334245	0.954243	3.196745	2.56729	3.298857	0.732394	-0.62276
1990	4.393399	3.697015	3.371124	0.954243	3.178443	2.735664	3.276602	0.690196	-0.62799
1991	4.421481	3.735704	3.394313	0.944483	3.160062	3.021986	3.305464	0.826075	-0.57901
1992	4.442666	3.702412	3.41125	0.977724	3.114095	2.598321	3.243708	0.690196	-0.50176
1993	4.457228	3.734133	3.424574	0.977724	3.08437	2.453722	3.190587	0.544068	-0.46657
1994	4.489995	3.733237	3.498761	0.869232	3.168997	2.467002	3.256668	0.897627	-0.43196
1995	4.503284	3.766076	3.564841	0.875061	3.038398	2.453097	3.207101	0.477121	-0.41198
1996	4.527233	3.808639	3.586287	0.892095	3.116861	2.483213	3.302062	0.755875	-0.40443
1997	4.548717	3.811861	3.589145	0.875061	3.062991	2.583771	3.279231	0.69897	-0.3655
1998	4.562822	3.821337	3.589928	0.875061	3.115771	2.603711	3.268506	0.531479	-0.39571
1999	4.582527	3.795408	3.591453	0.838849	3.094121	2.693335	3.344331	0.662758	-0.42792
2000	4.608091	3.83197	3.643031	0.724276	3.082967	2.750999	3.295813	0.78533	-0.36422
2001	4.6164	3.902194	3.689252	0.681241	3.080771	2.845098	3.303784	0.285557	-0.38254
2002	4.617253	3.890826	3.690167	0.643453	2.873762	2.890434	3.301741	-0.69897	-0.44541
2003	4.633275	3.891709	3.717365	0.633468	2.625066	2.915812	3.283909	0.579784	-0.42181
2004	4.652692	3.901951	3.745111	0.544068	2.832874	2.699199	3.327102	0.643453	-0.42039
2005	4.667283	3.942036	3.776915	0.531479	2.897953	2.882302	3.270899	0.50515	-0.42073
2006	4.685066	3.942411	3.760143	0.544068	2.812093	2.970661	3.229061	0.568202	-0.41688
2007	4.698237	3.999135	3.816373	0.544068	2.875631	3.12598	3.196716	0.447158	-0.42489
2008	4.722812	4.0524	3.876534	0.633468	2.797903	3.156309	3.337877	0.763428	-0.42907
2009	4.738701	4.134871	3.949891	0.681241	2.791763	3.058337	3.265433	0.591065	-0.41207
2010	4.756254	4.168093	4.004037	0.845098	2.803764	3.229514	3.231258	0.633468	-0.39615
2011	4.772518	4.184171	4.011304	0.845098	2.795723	3.342364	3.266976	0.591065	-0.43314
2012	4.790606	4.209978	4.067619	0.812913	2.724225	3.240888	3.254461	0.662758	-0.41312
2013	4.805996	4.193233	4.109899	0.778151	2.716635	2.918312	3.194562	0.579784	-0.38148
2014	4.833236	4.239205	4.152867	0.69897	2.925608	2.901318	3.279148	0.755875	-0.33867
2015	4.842345	4.29609	4.178926	0.60206	2.880858	3.197576	3.237397	0.365488	-0.34183

Source: Author's Calculation through Excel.

APPENDIX E

Selection of Maximum Lag Length by using the AIC and SBC Criterion for the Equation (3.12.1)

Lag Length for Dependent Variable	Lag Length for Independent Variable	AIC	SBC
1	1	-7.0158	-6.5358
1	2	-7.1140	-6.6875
1	3	-7.1140	-6.6875
2	1	-7.1133	-6.4274
2	2	-7.1140	-6.6875
2	3	-7.1140	-6.6875
3	1	-7.1067	-6.4564
3	2	-7.1140	-6.6875
3	3	-7.1140*	-6.6875*

Source: Author's Calculation through E-views
*Shows minimum values for AIC and SBC.

APPENDIX F

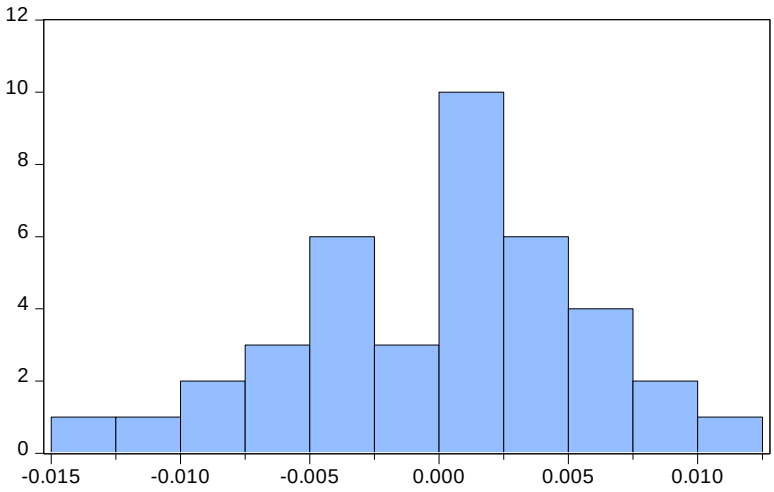
Coefficient of Short Run Relationship in the ARDL Cointegration (1,1,2,1,0) Form

Variables	Coefficient	Standard Error	t-statistics	Probability
D (LN RGE)	0.2049	0.0308	0.6637	0.0172
D (LN RF)	0.0967	0.0207	4.6702	0.0001
D (LN RF (-1))	-0.0402	0.0210	-1.9083	0.0663
D (LN OT)	0.1753	0.0315	5.5503	0.0000
D (LN INT)	-0.0134	0.0191	-0.7019	0.4883
ECT (-1)	-0.1742	0.0131	-13.2203	0.0000

Source: Author's Calculation through E-Views.

APPENDIX G

Normality Check of the ARDL (1,1,2,1,0) Cointegration Model



Series: Residuals	
Sample 3 41	
Observations 39	
Mean	7.82e-16
Median	0.000425
Maximum	0.011046
Minimum	-0.014092
Std. Dev.	0.005411
Skewness	-0.376045
Kurtosis	3.001747
Jarque-Bera	0.919166
Probability	0.631547

Source: Author's Calculation through E-Views

APPENDIX H

Breusch- Godfrey Serial Correlation LM Test for ARDL (1,1,2,1,0) Cointegration From

Lag Length	F-Statistics	Observed R-Squared	Probability	Chi-Square
1	0.0059	0.0082	0.9392	0.9276
2	1.5254	3.4866	0.2824	0.1749
3	0.8523	3.4920	0.4781	0.3218
4	0.8169	4.5082	0.5265	0.3416

Source: Author's Calculation through E-Views.

APPENDIX I

Heteroscedasticity Test Breusch- Pagan-Godfrey for ARDL (1,1,2,1,0) Model Cointegation Form

F-Statistics	Observed R Squared	Scaled Explained SS	Probability F (9,29)	Prob. Chi Square (9)	Prob. Chi Square (9)
1.2280	10.7621	5.9558	0.3162	0.2924	0.7443

Source: Author's Calculation through E-Views.