Impact of Public Expenditure on Economic Growth: Empirical Evidence from Selected South Asian Countries with Special Reference to Pakistan

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By

Muhammad Iftikhar ul Husnain

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FUUAST School of Economic Sciences
Federal Urdu University of Arts, Science and Technology (FUUAST), Islamabad, Pakistan
TO MY FATHER AND MOTHER
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ABSTRACT

In South Asia, like many other developing countries of the world, the role of public expenditure despite its relatively high share has not been satisfactory in addressing a number of social and economic issues over the years. Rising deficits, widening income inequality, mounting debts and low revenue earnings in South Asian countries demand for deep analysis of the issue. Direction of influence between public expenditure and economic activity, relative importance of the financing source of public expenditure and the optimal size of government needs to be investigated. This study targets expenditure-growth nexus in selected South Asian countries-Pakistan, India, Sri Lanka and Nepal-for the period 1975-2008.

The study finds that public expenditure and economic development do not show any long run relationship in Pakistan India and Nepal. This shows that economic development and public expenditure do not affect each other and are determined by some other factors. However, in Sri Lanka public expenditure and per capita GDP are linked in the long run. At disaggregated level, various components of public expenditure do not show any long run relationship with per capita GDP in all the countries. This shows that existing structure of government expenditure is not conducive to economic growth and some other structure of government expenditure can be more efficient in stimulating economic growth. This can be achieved by reorganizing, restructuring and redefining the role of public expenditure.

The study concludes that source of finance does matter in determining the impact of public expenditure on economic growth. Public expenditure financed through any source hurt growth in this region. However, seigniorage financed public expenditure has a larger negative effect on growth followed by debt financed and tax financed public expenditure. Therefore, it is suggested that reduction in public expenditure can boost growth in South Asia. However, in current scenario financing of public expenditure through taxes is the least costly option.

The study also finds, assuming balanced budget, that current size of governments in these countries is higher than the estimated optimal size. However, the difference between current and optimal size is very small. This shows a small scope for reduction in government size. Government size is optimized when public expenditure ranges from 18 to 28 percent of GDP. Under the unbalanced budget scenario, it is found that the current tax to GDP ratio is below the estimated growth maximizing tax ratio. A large scope (10 to 30%) exists to increase tax to GDP ratio to attain the optimal level of taxes. However, the estimated threshold level of taxes is lower in comparison with the developed countries. Unfriendly environment for taxpayers, complex tax rules, rampant tax evasion, vested discretionary powers of the tax collectors, narrow and rigid tax base, among others, are responsible for this low threshold level of taxes. Strict fiscal discipline through cuts in public spending, restructuring and reorganization of the tax regime to mobilize more domestic resources is the suggested panacea for major economic concerns of the South Asian region.
# TABLE OF CONTENTS

Acknowledgements .............................................. i

Abstract ................................................................ ii

## Chapter 1

*Introduction*

1.1- Fiscal Policy .............................................. 4

1.2- Wagner versus Keynes .................................. 5

1.3- The Concept of Optimally Sized Government .... 5

1.4- Identification of Research Gaps ...................... 6

1.5- Significance and Motivation for the Study .......... 8

1.6- Objectives of the Study ................................. 9

1.7- Scheme of the Dissertation ............................ 11

1.8- Concluding Remarks .................................... 12

## Chapter 2

*Literature Review* ............................................ 13

2.1- Direction of Influence between Public Expenditure and Economic Growth ..... 13

2.2- Public Expenditure Growth-Nexus .................. 18

2.3- Relationship between Defense Expenditure and Economic Growth ............... 31

2.4- Tax Debt and Growth Nexus .......................... 32

2.5- Optimal Level of Public Expenditure/Taxes ........ 36

2.6- Conclusion ................................................. 40
Chapter 3

Fiscal Scenario in Selected South Asian Countries with a Focus on Pakistan

3.1- A Smart Look at the Economies of Pakistan, India, Sri Lanka and Nepal

3.1.1- Pakistan

3.1.2- India

3.1.3- Sri Lanka

3.1.4- Nepal

3.2- An Overview of Fiscal Scenario in Pakistan, India, Sri Lanka and Nepal

3.2.1- Public Expenditure

3.2.2- Current and Development Expenditure in Pakistan

3.2.3- Public Revenues

3.2.4- Tax Revenues

3.2.5- Direct and Indirect Taxes in Pakistan

3.2.6- Tax Structure in Pakistan

3.2.7- Fiscal Deficit

3.2.8- Defense Expenditure

3.2.9- Public Education Expenditure

3.2.10- Public Health Expenditure

3.3- Conclusion
Chapter 4

Keynes versus Wagner: Aggregated and Disaggregated Analysis of Public Expenditure

4.1- Introduction
4.2- Functional Forms of Wagner’s Law
4.3- Data and Variables
4.4- Econometric Methodology
   4.4.1- Unit Root
   4.4.2- Co-integration
      4.4.2.1- Engel Granger Co-integration Test
4.4.3- Causality
   4.4.3.1- Testing for Causality
4.5- Estimation and Results
   4.5.1- Pakistan
   4.5.2- India
   4.5.3- Sri Lanka
   4.5.4- Nepal
4.6- Concluding Remarks

Chapter 5

Impact of Public Expenditure on Economic Growth: Does the source of Finance Matter?

5.1- Introduction
Chapter 5

Data and Variables

5.2.1- Government Borrowing
5.2.2- Seigniorage
5.2.3- Deficit
5.2.4- Other Expenditure
5.2.5- Trade Openness
5.2.6- Reserve Money

5.3- The Model and Econometric Methodology

5.3.1- Government Budget Constraint
5.3.2- Regression Specifications
  5.3.2.1- Debt Financed Public Expenditure
  5.3.2.2- Money Financed Public Expenditure
  5.3.2.3- Tax Financed Public Expenditure

5.4- Estimation and Results

5.4.1- Analysis with Alternative Measures of Seigniorage

5.5- Concluding Remarks

Chapter 6

Optimal Level of Public Expenditure/Taxes in Selected South Asian Countries

6.1- Introduction
6.2- What Does the Optimal Size of Government Mean?
6.3- Data
6.4- Analytical Framework
  6.4.1- Scenario 1: Balanced Budget
Chapter 7

Conclusion and Policy Implications

7.1- Summary
7.2- Policy Implications
7.3- Future Research Directions

Bibliography

Appendixes

Appendix I:
Table: A-1 The Critical Values of Augmented Dickey Fuller Unit Root Test

Appendix II:
Table: A-3 Trade Policies in Selected South Asian Countries (1970-2008)
Table: A-4 Employment Policies in Selected South Asian Countries (1970-2008)

Appendix III:
Table: A-6 Description of Variables with Their Source

Appendix IV: Panel Estimation Using OLS
Table: A-7 Results with Aggregate Public Expenditure Using OLS
Appendix V:

Table: A-8  Measures of Seigniorage  172

Appendix VI:

Calculation of F-statistics  173

Appendix VII:

Time Series Estimation  174

Table: A-9  Results with Aggregated Public Expenditure (OLS), Pakistan  174
Table: A-10  Results with Aggregated Public Expenditure (OLS), India  175
Table: A-11  Results with Aggregated Public Expenditure (OLS), Sri Lanka  176
Table: A-12  Results with Aggregated Public Expenditure (OLS), Nepal  177

Appendix VIII:

Table: A-13  Selected Diagnostic Test Results of the Model (Pakistan)  178
Table: A-14  Selected Diagnostic Test Results of the Model (India)  178
Table: A-15  Selected Diagnostic Test Results of the Model (Sri Lanka)  179
Table: A-16  Selected Diagnostic Test Results of the Model (Nepal)  179

Appendix IX:

Derivation of equation (6.7)  180
LIST OF TABLES

Table 3.1- Fiscal Scenario in South Asia (as % of GDP) 50

Table 4.1- ADF Unit Root Test Results for Pakistan, India, Sri Lanka and Nepal 79

Table 4.2- Engel Granger Residual Based Co-Integration Test Results for Selected South Asian Countries

Table 4.3- Summary of Granger Causality Test Results (Pakistan) 81

Table 4.4- Summary of Granger Causality Test Results (India) 83

Table 4.5- Error Correction Analysis (Sri Lanka) 85

Table 4.6- Summary of Granger Causality Test Results (Sri Lanka) 86

Table 4.7- Error Correction Analysis (Nepal) 87

Table 4.8- Summary of Granger Causality Test Results (Nepal) 88

Table 5.1- Descriptive Statistics for Selected South Asian Countries 107

Table 5.2- Results with Aggregated Public Expenditure Using Fixed Effect Model (FEM) 110

Table 5.3- Results with Disaggregated Public Expenditure Using Fixed Effect Model (FEM) 113

Table 5.4- Results with Alternative Seigniorage Measures Using Fixed Effect Model (FEM) 117

Table 6.1- ADF Unit Root Test Results for Pakistan, India, Sri Lanka and Nepal 128

Table 6.2: OLS Estimation Output for Pakistan, India, Sri Lanka and Nepal 129

Table 6.3: Optimal and Current level of Public Expenditure in Selected South Asian Countries 130

Table 6.4: Optimal Level of Public Expenditure in Developed Countries 133

Table 6.5: OLS Estimation Output for Selected South Asian Countries 136

Table 6.6: Threshold and Current level of Taxes in Pakistan, India, Sri Lanka and Nepal 137
LIST OF FIGURES

Figure 3.1- Trends of Public Expenditure in South Asia (as % of GDP) 51

Figure 3.2- Current versus Development Expenditure in Pakistan (as % of GDP) 53

Figure 3.3- Public Revenues Trajectories in South Asian Countries (as % of GDP) 54

Figure 3.4- Tax Revenues in Pakistan, India, Sri Lanka and Nepal (as % of GDP) 55

Figure 3.5- Direct Versus Indirect Taxes in Pakistan (as % of GDP) 56

Figure 3.6- Tax Structure in Pakistan (as % of Total Tax Revenues) 57

Figure 3.7- Fiscal Deficits of South Asian Countries (as % of GDP) 59

Figure 3.8- Defense Expenditure in Selected South Asian Countries (as % of GDP) 61

Figure 3.9- Public Education Expenditure Trajectories in Selected South Asian Countries (as % of GDP) 63

Figure 3.10- Public Health Expenditure in South Asia (as % of GDP) 64

Figure 6.1- Army Curve 124
CHAPTER 1
INTRODUCTION

Public finance is considered the centerpiece of public policies aimed at enhancing economic growth. More or less, these policies are executed through public expenditure and revenues. These policies can have major impacts on economic growth. Therefore, knowledge regarding direction, nature and magnitude of the effects of changes in public expenditure on economic growth has paramount importance. Consequently, the role of public expenditure and its sources of finance has been highly debated subject among the researchers in the recent past theoretically as well as empirically.

On the theoretical front, broadly speaking, two opposite views with valid arguments exist regarding expenditure-growth nexus. The traditional view argues that private investment crowds out as a result of government expenditure that leads to slow economic growth. Higher public expenditure either financed with taxes or debt raises interest rate and makes capital more expensive that causes reduction in private investment (Classical). The non-traditional view, on the other hand, considers public expenditure as pro growth. This occurs when the resources in a country are unemployed or under-employed. Through the function of multiplier and accelerator, effective demand for goods and services increases that ultimately leads to expansionary effects of public expenditure (Keynes). At the empirical level, even more ambiguity exists. Debatable and competing results emerge on the public expenditure growth-nexus. Some studies, (Barro, 1991; Sattar, 1993; Knoop, 1999; Hakro, 2009; Al-Batil, 2000; Bleaney et al, 2001; Ramirez and Nazmi, 2003), find positive while many others, (Landau, 1983;
Saunders, 1985; Ram, 1986; Aschauer, 1989; Ali, 2005), find negative relationship between public expenditure and economic growth. Hence, mixed results pervade the literature and no consensus emerges. Agell et al (1997) conclude, “..... the theoretical and empirical evidence .....is found to admit no conclusion on whether the relation is positive, negative or non-existent”.

Whatever is the relationship between government expenditure and economic growth, its importance cannot be denied, as in all the countries public sector persists with varying degree to address a number of social and economic issues which are important for development. Furthermore, the importance of public expenditure exacerbates in the countries where public resources remain sadly insufficient due to ineffective tax systems, weak tax authorities, the growth in the shadow economy, capital flight to tax heavens and trade liberalization and tariff reductions. South Asia is the region where role of public expenditure has not been satisfactorily effective over the years as governments have not been able to address the critical issues like large deficits, sky-rocketing public debts, widening income inequality, low tax to GDP ratio, high level of non productive expenditure and descending living standard of the population. However, despite inefficiency, the share of public expenditure in these economies is relatively high. In addition, the government expenditure has outstripped government revenues in these economies on constant basis as they have constraint on taxation that has led to persistent fiscal deficits. This resource gap can be bridged mainly through generating revenues from taxes, bonds or printing of money. Financing of public expenditure through different sources can affect growth differently depending upon the resultant distortions caused by the respective source. This calls for the rigorous analysis of public expenditure-growth nexus in South Asian
economies. Following from the foregoing, this study attempts to examine the relationship between public expenditure and economic growth at aggregated as well as disaggregated level for the selected South Asian countries-Pakistan, India, Sri Lanka and Nepal-for the period 1975-2008.

This study serves number of purposes. Firstly, it investigates the direction of influence between public expenditure and economic activity. It can run from government expenditure to economic activity or vice versa. The knowledge of the direction of influence will provide the basis for further rigorous analysis of public expenditure-growth nexus. Secondly, the relative importance of each financing source of public expenditure is analyzed. This analysis helps policy makers in making the right choice regarding the financing source of public expenditure. Thirdly and more importantly, the present study attempts to determine the threshold level of public expenditure under balanced as well as unbalanced budget assumptions. This will help the authorities to increase/decrease level of public expenditure to attain the optimal size of government. Needless to say this study seems timely and important in respect of the current economic perspective of the South Asian region.

This chapter proceeds as follows. The next section, 1.1, defines fiscal policy. Section 1.2 describes Wagner’s and Keynes hypotheses. Section 1.3 sheds light on the optimal size of government. In section 1.4, the research gaps in the existing literature are identified. Section 1.5 states the significance and motivation behind the present study. Section 1.6 lays down main objectives of the study. Section 1.7 highlights the schematic plan of the present research. The last section, 1.8, comprises some concluding remarks about the chapter.
1.1- Fiscal Policy:

Fiscal policy, in essence, is a short run phenomenon. However, the long run policy implications of the short run instruments of government expenditure and taxes are not of trivial importance. On the expenditure side, a number of fiscal policy instruments are believed to have long run effects. For example, investment in education broadens the resource base of the economy through increase in the level of human capital. This results in higher level of output (Lucus, 1988). On the revenue side, taxes are known to have distortionary effects. The taxes disturb the decision making of private agent in respect of saving and investment that potentially can alter the growth rate of the economy through slowing down the process of capital accumulation (Milesi-Feretti and Roubini, 1998).

The primary objective of the fiscal policy is to accelerate economic growth through the mechanism of revenues and expenditure in a country. Reducing income inequality and poverty among income classes, improvement of employment and resource allocation among others are the fundamental objectives that are achieved through this mechanism. Due to limited resources, governments in developing countries find it hard to allocate resources for development purposes which are corner stone to achieve the goals of economic growth and prosperity. Consequently, governments have to run large deficits to mitigate developmental expenditure along with downward rigid non developmental expenditure. Increase in taxes, floating of bonds and seigniorage are the available options to bridge this resource gap. Each has some effects, positive or negative, on economic growth.
1.2- Wagner versus Keynes:

Expansion in economic activity causes public expenditure to grow. This well known statement is known as Wagner’s law in economic literature. Put differently public expenditure is endogenous and caused by national income. Why this happens? Wagner offered three possible explanations. Firstly, public expenditure on administrative and protective functions grows as the economy becomes more specialized and economic life more automated as a result of the increased division of labor. Secondly, cultural and welfare expenditure expand with respect to education and redistribution of income. Thirdly, due to technological changes in many activities, private monopolies emerge to whom states have to take over in the interest of economic efficiency (Chletos and Kollias, 1997).

Contrary to Wagnerian view, Keynesian doctrine believes that government expenditure is exogenously determined and causality runs from government expenditure to economic growth. Furthermore, government expenditure can be used as an instrument to affect growth. In nutshell, Wagnerian and Keynesian are two different views resolving the issue “which came first: the egg or the chicken?”

1.3- The Concept of Optimally Sized Government:

What does optimal size of government mean? Should it be too large or too small? Army (1995) argues that zero percent government, creates anarchy and per capita output is low in the absence of rule of law and property rights are not protected properly. The hundred percent government also restricts per capita output as private sector is discouraged leading to
inefficient allocation of resources. Barro (1990) shows that different sizes of government can affect growth rate in two different ways. An increase in taxes hurts growth while increase in public expenditure raises marginal productivity of capital which, in turn, raises growth. He further states that the negative effect of taxes dominates when the size of government is large and the positive effect of public spending dominates at a smaller level of government. On this ground, he argues that an optimal level of public spending should exist. Succinctly speaking, the optimal size of government is the point where the growth is maximized. It is the level where private and public sector share the decision making in allocation of resources and play their respective role in economic activity; the output level is higher and resources have their optimal utilization.

1.4- Identification of Research Gapes:

The linkage between government expenditure and economic growth has been a subject of great interest for the economist since the advent of Macroeconomics. A number of studies have investigated this relationship over time and across countries theoretically as well as empirically. However, no consensus can be found on the effects of changes in public expenditure on economic growth. In a broader sense, this literature can be divided into three main groups.

One strand of literature focuses on the direction of influence between government expenditure and economic growth (Gupta, 1967; Pluta, 1979; Cheng and Lai, 1997; Sinha, 1998; Biswal et al, 1999; Chang et al, 2004; Loizides and Vamvoukas, 2005; Huang, 2006; Sideris, 2007). These studies are about developed countries and consider public expenditure at aggregate level which
has limited policy implications. The knowledge of the influence among different categories of public expenditure and economic growth is essential for policy framework, yet it has been neglected particularly in case of developing countries.

Another strand of literature targets public expenditure-growth nexus and ignores the role of budget constraint.¹ The findings of these studies are less reliable as the impact of fiscal variables cannot be captured precisely in the absence of budget constraint. However, within this strand of literature a small group of studies includes budget constraint while investigating the relationship between government expenditure and economic growth (Barro, 1990; Palivos and Yip, 1995; Miller and Russek, 1997; Espinosa-Vega and Yip, 1999). These studies compare the effects of tax financed and debt financed public expenditure on economic growth. However, the role of debt financed expenditure remains ambiguous as these studies are unable to distinguish between seigniorage and bond financing which makes the results less reliable. Therefore, the independent role of tax financed, bond financed and seigniorage financed public expenditure in determining economic growth warrants close investigation at aggregated as well as disaggregated level of government expenditure.

In addition to already discussed two strands of literature, a few studies can be found that try to determine the optimal level of public expenditure. The notable contribution is from Scully (1994, 1996) who finds the optimal level of public spending for United States and New Zealand. These studies are based on the critical assumption that governments have balanced budgets. This assumption seems unrealistic in respect of developing countries. Therefore, the optimal

¹ (Knoop, 1999; Ghura, 1995; Gupta and Verhoeven, 2001) among others.
size of government that can maximize the growth rate under the assumption of balanced as well as unbalanced budget attracts attention in respect of developing countries.

1.5- Significance and Motivation for the Study:

The relationship between public expenditure and economic growth has been extensively tested by the researchers over the years. However, despite the existence of rich literature on the subject, the unanimity of results is rare. The presence of diversified nature of results on the issue is the driving force behind the present study. This study focuses on the areas that are not addressed appropriately and provides a detailed and rigorous analysis of the less addressed issues. The direction of influence between government expenditure and economic activity has been discussed in a number of studies but the question “which came first: the egg or the chicken?” is not unanimously resolved. Put differently, is this relationship Keynesian or Wagnerian? Specifically no study is available that targets this question at disaggregated level of public expenditure in respect of developing countries. The knowledge of the influence will enable policy makers to design policies accordingly.

South Asian countries are burdened with debt and facing fiscal deficits. High level of poverty and inefficient tax systems restrict government tax revenues. Thus, governments float bonds and print money to provide necessary public goods and services to the people. Different sources of public expenditure financing affect growth differently depending upon the distortions caused by each source. This study aims to help policy makers to choose appropriate source to finance public expenditure.
The size of public expenditure is not the same across countries. Whether it should be too large or too small is a question that needs to be answered as different sizes of governments have different policy implications in terms of growth and development. Further, it is of paramount importance to find the threshold level of public expenditures/taxes in developing economies because despite ineffective role of public expenditure, the size of government is relatively high in these economies. Attempts have been made to address this issue depending upon the critical assumption of balanced budget in case of advanced economies. This assumption is not justifiable in case of developing countries as budget deficits persist in these economies. No attempt can be traced that try to find the optimal level of public expenditure assuming deficit in the budget. This study targets these issues and tries to complement the existing literature on these fronts.

1.6- Objectives of the Study:

This study has been designed to achieve the following objectives;

1- To know the direction of influence between government expenditure and economic growth; Wagnerian or Keynesian?

The direction of influence between government expenditure and economic activity is not necessarily unidirectional or bidirectional. Be it Keynesian or Wagnerian, it has the implications. Engel Granger (1987) co-integration procedure is used to investigate the long run linkage between public expenditure, its sub components and economic growth. Error Correction Mechanism (ECM) is used to determine the short run dynamics between the co-
integrated variables while Granger Causality test is used to know the direction of influence between non-co-integrating variables.

2- To find the impact of public expenditure on economic growth when financed through taxes, bonds and seigniorage.

Government can finance its expenditure by three major sources; taxes, bonds and seigniorage. The impact of public expenditure on growth varies as the source of finance differs. Fixed Effect Model (FEM) has been applied to measure the relative effects of different sources of finance i.e., taxes, bonds and seigniorage on economic growth. To achieve this, budget constraint has been included in the analysis that will help obtain the precise estimates of fiscal coefficients. This will guide the policy makers to choose the least costly option to finance public expenditure.

3- To determine the optimal/threshold level of public expenditure/taxes.

To achieve this objective, it is tested that whether the current size of government is above/below the estimated threshold level in the sample countries. The Scully (2003 & 2006) model is applied to find the optimal level of public expenditure assuming balanced budget. Then, this model is extended to measure the optimal size of government under the assumption of unbalanced budget, a common phenomenon in developing countries. This helps policy makers to increase/decrease public expenditure to improve welfare by efficient allocation of resources.
1.7- Scheme of the Dissertation:

*Chapter two* documents previous work that has been carried out on public expenditure-growth nexus at theoretical as well as empirical level. It presents findings of the studies on three main areas in context of the issue as direction of influence between public expenditure and economic activity, fiscal policy and the optimal size of government. The purpose is to highlight the areas that have not been properly addressed by the researchers so that the guidelines for the future research may be defined. It also provides help in reporting results of the present research.

*Chapter three* gives a brief fiscal scenario of the selected South Asian economies with a focus on Pakistan. It presents a comparative analysis of public revenues and public expenditure across the region. The chapter ends with some suggestions that can help improve the sad fiscal scenario of these countries.

*Chapter four* addresses the first objective of the study by analyzing the direction of influence between public expenditure and economic development. ADF unit root test has been applied to test stationarity of the different series included in the estimation. Engel Granger co-integration (1987) technique is used to test long run relation between the variables. Error Correction Model determines the short run dynamics of the model and indirectly states the direction of influence. For non co-integrated variables standard Granger causality test has been used to examine the short run nature of causality. The analysis in chapter 4 paves the way for rigorous analysis of the issue in chapters 5 and 6.
Chapter five concentrates on the role of budget constraint in economic growth. The purpose is to see the individual effects of taxes, bonds and seigniorage financed public expenditure on economic growth. Fixed Effect Model (FEM) has been used to estimate the regression coefficients. At the end of chapter, results of the regression analysis with alternative seigniorage measures are also presented to check the robustness of the base line regression results. The main variables used in the analysis of chapter 5 are also discussed briefly.

In chapter six, analytical framework to find the optimal level of public expenditure, assuming balanced budget, is explained. Further, the framework is extended under the assumption of unbalanced budget to find the optimal level of taxes. The chapter also presents a comparison of the threshold size of governments in developing and developed countries.

Chapter seven consists of a brief summary of the dissertation and presents policy implications. The chapter ends with highlighting some directions which future research can explore.

1.8- Concluding Remarks:

The focus of the present study is on public expenditure growth-nexus in different respects. The selection of these dimensions of research is an outcome of the detailed survey of the existing literature that assesses the relationship between public expenditure and economic growth theoretically as well as empirically. The study provides policy recommendations that can be helpful in reorganizing the role of government in economic activity and efficient resource allocation in developing countries.
CHAPTER 2
LITERATURE REVIEW

This chapter documents the previous literature, theoretical as well as empirical, on three broad issues. Section 2.1, discusses the studies that explain the direction of influence between public expenditure and economic growth. Section 2.2 highlights the literature on public expenditure growth-nexus. Section 2.3 includes the studies that focus on the relationship between defense expenditure and economic growth. In section 2.4 those studies have been included that discuss tax, debt and growth nexus. Section 2.5 reports the studies that focus on the optimal/threshold level of public expenditure/taxes. Section 2.6 comprises some concluding remarks.

2.1: Direction of Influence between Public Expenditure and Economic Growth:

In 1958, the English translations of Wagner's works attracted researcher's attention to investigate Wagner's law due to its important policy implications. The principal factor that guided the researchers to test this law was the difficulty of a possible feedback in macro relations that obscured direction and the nature of causality.\(^2\) The earlier studies have applied traditional regression models which assume variables as stationary; therefore, results are less reliable. But recently this law has been tested by employing most modern econometrics techniques both for developed and developing countries using time series as well as cross

\(^2\) Loizides and Vamvoukas (2005)
section data sets. However, findings of empirical literature on this issue are mixed and inconclusive.

Chang, Liu and Caudill (2004) test five different versions of Wagner’s law for ten countries over the period 1951-1996 by using co-integration and error correction modeling techniques. They find unidirectional causality from income to public expenditure for South Korea, Taiwan, Japan, UK and USA. For the remaining five countries- Thailand, Canada, New Zealand, Australia and South Africa-no evidence is available in favor of Wagner’s hypothesis.

Iyare and Lorde (2004) test six different versions of Wagner’s law using annual time series data on nine Caribbean countries. A long run relation has been found only in case of three countries- Grenada, Guyana and Jamaica for a particular formulation of the law. For Jamaica and Grenada public expenditure causes national income and the relationship is unidirectional. While in Guyana the growth of public expenditure is the result of growth in national income implying the presence of Wagner’s law.

Biswal, Dhawan and Lee (1999) apply Engle Granger co-integration and error correction modeling procedure to analyze Keynes versus Wagner hypothesis on Canadian data for the period 1950-1995. They use data on various sub categories of government expenditure and find no long run linkage between government expenditure and national income. However, it is found that national income either causes or caused by different components of public expenditure in the short run.

In a time series study, Halicioglu (2003) examines the validity of Wagner’s law for Turkish data for the period 1960-2000 by utilizing modern time series econometric techniques.
The study concludes that Wagner’s law does not hold for Turkey. But interestingly statistical evidence supports of an augmented version of the Wagner’s hypothesis.

Loizides and Vamvoukas (2005) investigate the causal relationship between growth in government size and income growth for UK, Greece and Ireland and report that in all countries, both in short and long run, public expenditure Granger cause growth in national income. The Greece economy verifies the application of Wagner’s law as growth in output leads to growth in public expenditure. On the other hand Irish economy does not favor the presence of the Wagner’s hypothesis.

By applying the VAR approach on a time series data of South Korea from 1954 to 1994, Cheng and Lai (1997) find evidence that supports the well-known proposition in the empirical literature that the government’s role has been substantial in economic development of Korea. These results favor the conventional Keynesian framework that government expenditure affect national income as well as the Wagner’s law that growth in national income causes growth in public expenditure.

Sinha (1998) conducts a time series study to analyze the co-integration between public expenditure and economic growth in Malaysia for the period 1950-92. He finds that non economic factors have dominant role in determining the growth in public expenditure as GDP does not cause public expenditure in Malaysia. Further the existing structure of public expenditure is not pro growth and some other structure of government expenditure may be more efficient in stimulating economic growth.
Ram (1987) conducts a time series as well as cross-section study about 115 countries by using data on income and government expenditure to analyze the validity of Wagner’s law for the period 1950-80. He finds that for 60% of the countries the law seems to be supported and refuted for rest of the countries. The negative sign of elasticities of government expenditure to GDP is significant for the full sample. Further the elasticity is less than unity. The study draws a general conclusion that time series data supports Wagner’s law more than cross-section data.

In a cross country study of 34 countries for the post World War II period, Wagner and Weber (1977) test for the Wagner’s law and find strong support in favor of the hypothesis with some exceptions like France and Germany.

In a time series study, Sideris (2007) examines Wagner’s hypothesis using Greece data from the 19th and the beginning of the 20th century. The results provide strong support in favor of Wagner’s hypothesis and do not contradict the empirical findings of the studies of the 19th century on Greece.

Employing time series data for G7 countries for the period 1960 to 1993, Kolluri, Panik and Wahab (2000) find positive support in favor of Wagner’s law for developed countries. By dividing sample of 53 countries into three groups Abisadeh and Gray (1985) test for the validity of Wagner’s hypothesis and report that for poor and developed countries this law does not hold while for developing countries it does hold. On the other hand Ansari, Gordon and Akumamoah (1997) find positive support in favor of Wagner’s law when they test it for South Africa, Ghana and Kenya. Recently, using annual time series data, covering the period from 1979 to 2002, Huang (2006) investigates Wagner’s law for China and Taiwan and reports that
The study confirms the presence of unidirectional relationship running from gross domestic product to public expenditure, hence supporting the existence of Wagner’s law. In a recent study Sinha (2007) tests Wagner’s law for Thailand for the period 1950-2003 and finds weak evidence in favor of the law. Khan (1990) tests Wagner’s law for Pakistan using time series data from 1959 to 1984 and finds some support in favor of the hypothesis as a whole.

2.2: Public Expenditure Growth-Nexus:

Economists have been deeply interested in analyzing the linkage between government expenditure and economic growth since the advent of Macroeconomics. An unending discussion started on the role of government with the publication of the general theory by John Menard Keynes in 1936. But the debate on this critical issue, both at theoretical and empirical level, is still controversial and inconclusive. In addition to these conflicting views, the existing literature shows a disturbing trend. However, a weak consensus emerges. If government expenditure is used as a share of GDP in the model then many studies empirically support negative correlation between public expenditure and economic growth. This linkage becomes positive, on the other hand, when government expenditure is used as an annual percentage change in the analysis.

Odedokun (2001) conducts a comprehensive study about 103 developing countries by categorizing them into four different groups-rich, poor, mineral export dependent and foreign aid dependent countries to find the impact of different components of public expenditure on economic growth. He finds that in high income and mineral exporting countries, capital

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3 Bose, Haque and Osborn (2003)
expenditure is negatively associated with economic growth and in low income countries it has no significant effect on growth. Similarly high level of current government expenditure hinders growth in all groups with the exception of foreign aid dependent countries. At disaggregated level, expenditure on goods and services negatively affect growth but expenditure on wages and salaries stimulate growth across all groups. Mixed and often insignificant impacts have been found for other categories of current expenditure across different groups. Expenditure on education and transport stimulate economic growth while expenditure on defense and general administration affect growth negatively.

Landau (1983) analyzes the long run relationship between government consumption expenditure and economic growth for a sample of 96 countries and finds that consumption expenditure has negative effect on growth for the full sample weighted or unweighted by population. His findings are consistent with the views of pro free market that suggest a negative effect of public expenditure on growth. It has also been found that low per capita income countries have grown slower than the middle and high income countries. The reason for this slow growth is the less public spending on education and high share of public consumption expenditure as a share of GDP on the part of government. However, relation between public investment in education and growth is positive and significant for the whole sample.

Using data of 43 developing countries, Devarajan, Swaroop and Zou (1996) examine the linkage between composition of government expenditure and economic growth and report that consumption expenditure is positively correlated with economic growth while capital expenditure has negative effect on per capita GDP growth.
Glomm and Ravikumar (1997) present a comprehensive review of the present developments in endogenous growth models and study the impact of public expenditure on long run growth. Two types of public expenditure are focused; first that appear as inputs into the production function to produce final goods. The second types are incorporated as inputs in investment technologies as government education expenditure. Other related issues such as endogenous public policy, source of financing government expenditure and private alternatives have also been discussed. In addition, the output elasticities of government education expenditure and public capital are reviewed. The empirical results show that government health expenditure enhances growth by increasing the life expectancy. The long run impact of government health expenditure can be determined by dynamic general equilibrium model that considers mortality rates and life expectancy. It has also been recorded that without these models the impact of productive government expenditure remains ambiguous.

Barro (1991) examines correlation between growth, fertility, and investment for 98 countries for the period 1960-1985 and finds results contrary to the convergence hypothesis of the neoclassical models under the assumption of diminishing returns to capital. In the post World War II period the per capita growth rates were not associated with the initial level of per capita income. On the other hand when the constant measures of initial human capital are applied then it is found that countries with lower per capita income grew at faster rate than the developed countries. The government consumption is inversely related to growth because of the distortions like high tax rates. Political stability ensures property rights and has positive impact on economic growth. The framework employed in the study is unable to explain the
relatively slow growth of sub-Saharan Africa and Latin American countries and does not capture the country specific characteristics that led to poor economic growth in these regions.

Saunders (1985) provides a comprehensive analysis of public spending-growth nexus in OECD countries for the period 1960-80 by employing a cross-section multiple regression approach. He uses growth rate of the economy, growth in private employment and consumer price inflation rate as indicators of economic performance. For the last five years of the study period little evidence is available on the negative relationship between government expenditure and economic growth. However, it is recorded that in 1960’s size of government was detrimental to growth. The results show that six percentage point increase in public expenditure to GDP ratio reduces economic growth rate by one percent.

Turnovsky and Fisher (1995) compare the effects of public consumption expenditure and public expenditure on infrastructure within the context of intertemporal optimizing market clearing framework. They find that under plausible conditions a unit increase in public expenditure on infrastructure shows more productivity than government consumption expenditure. Further the net increase in either type of government spending is equal to crowding out effect. They also report that in United States, infrastructure is under supplied and the optimal time path for government expenditure over time is determined by the fiscal policy.

Al-Batil (2000) employs time series data to examine the role of government in economic development of Saudi Arabia and points out that the role of government has been important in growth and development of the country over time. Co-integration results reveal the existence of a long run relationship between public expenditure and economic growth. In Saudi Arabia
government has facilitated the establishment of large companies and reduced market distortions to maintain the efficiency of the economy along with provision of infrastructure and modern education system.

Knoop (1999) reports the positive correlation between the size of government and economic growth when analyzed within the framework of endogenous growth model in the United States economy. As the government size reduces, the growth and welfare also reduce and vice versa. This mechanism works when the government purchases affect directly both the utility of consumers and the productivity of the firm.

Sattar (1993) finds that some categories of public expenditure have dampening impact on economic growth while others stimulate economic activity. Moreover, the impact of different categories of public spending varies significantly between the industrialized and low income countries. Public expenditure has been observed to have no impact on growth in developed countries and a positive impact in developing countries.

Khan and Reinhart (1990) compare the relative impact of public and private investment on economic growth in 23 developing countries. By framing a simple growth model that differentiate the impacts of public and private components of investment, the study concludes that marginal productivities of public investment and private investment differ significantly across countries. These findings support the views of the proponent of market base strategies. A warning also sounds from the study that it considers only the direct impact of both kinds of investment on economic growth and the model does not allow for the complementary and
indirect role of public investment that it can perform in enhancing the efficiency of private investment.

Cashin (1995) investigates the linkage between government expenditure and economic growth in 23 developed countries over the period 1971-88 within an endogenous growth setting, a framework in which public spending can affect output growth rate. The study finds that if the government spends resources on the items that enter as public inputs to the production functions of a private agent then it affects growth positively. For example government spending on investment and transfer payments generates positive externalities and increase private investment that in turn stimulates economic growth. On the other hand financing of such public expenditure through distortionary taxes limits marginal benefits on private capital and resultantly growth is suppressed.

Hakro (2009) use panel regression approach on a sample of 21 developing countries in South Asia for the period 1981-2005 to assess the relationship between public expenditure and per capita GDP growth. He finds a positive association between government size and per capita GDP as large governments provide employment opportunities to the labor force that leads to higher per capita income. Interestingly labor force coefficient is positive and significant which shows positive contribution of labor force to the economic performance of the developing South Asian nations. This also suggests that government should spend on education, training and skills as these facilities will enhance the productivity of the workers. Investment especially in human capital may trigger higher growth rates.

They categorize government expenditure into two sub categories, productive and non productive, to capture the impact of each category on economic growth. They report that fiscal policy has been playing a crucial role in Kenya. Productive consumption expenditure is negatively correlated with growth suggesting the re-organization of such expenditure so that it could contribute to economic growth. On the other hand government investment has a positive effect on growth as it boosts private investment by its complementary role. Empirical results also reveal positive association between private investment, human capital accumulation and economic growth.

Ramirez and Nazmi (2003) analyze the nexus between public investment and growth for nine Latin American countries over the period 1983-93 by developing a dynamic optimization framework. They conclude that public as well as private investment is positively associated with economic growth. Public consumption expenditure hurt investment and hence growth. Public expenditure on health and education stimulate growth significantly. They suggest that scarce government expenditure should be directed to increase new human capital along with the maintenance of the existing stock of human capital.

Ahmed and Miller (2000) examine the impact of public expenditure on investment both for developing and developed countries. They report that government expenditure, at disaggregated level, financed through taxes crowds out more investment and impedes growth as compare to their counterpart debt financed government expenditure both in developing and developed countries. Similarly expenditure on welfare and social security crowds out investment either these expenditure are tax financed or debt financed across all specifications.
Expenditure on transport and communication also show positive effect on investment in developing countries highlighting the role of infrastructure in stimulating investment and hence economic growth. The findings support both the traditional view of crowding out and non traditional view of crowding in effect of public spending.

Jones (1990) examines the relationship between state expenditure policies and economic growth using a disequilibrium-adjustment model for the period 1964-1984 and finds that different categories of public expenditure affect growth differently. For all measures of economic growth, welfare expenditure is correlated with stagnation while expenditure on education shows mixed function with consumption and investment factors. Other expenditure particularly local expenditure has positive effect on economic growth.

Nijkamp and Poot (2004) report the literature that focuses on the public expenditure-growth nexuses considering different policy areas such as education expenditure. They use sample of 93 articles published in referred journals during the period of early 1980s to late 1990s. It has been found that the effect of fiscal variables is weak with the exception of public expenditure on education and infrastructure and these results are highly sensitive to the research design parameters. In cross country regressions the inclusion of initial level of GDP matters and only those regressions detect significant effect of policy that includes initial level of GDP as compare to those that exclude it.

Knight, Loayza and Villanueva (1993) analyze the country specific determinants of economic growth and report that fixed government investment is significantly associated with overall economic growth. The findings are in line with the predictions of Solow-Swan’s model
that savings affect the steady state and transitional growth rate of per capita GDP positively. The model also predicts that diminishing return to physical capital start functioning quickly supporting the rapid convergence hypothesis. A comparison between developed and developing countries reveals that many developing countries show slow growth in per capita terms in the presence of rapid rates of population growth. The countries with low level of initial human capital and government fixed investment experience low productivity of physical investment as the efficiency of physical investment remains restricted under the influence of these factors. As prior prediction of the model, government fixed investment exerts positive and significant effect on economic growth recognizing the importance of government role than private sector in providing infrastructure. This can be explained in terms of either underinvestment on the part of private sector or the greater marginal productivity of public sector resources. A high tariff ratio hurts capital imports that lead to slow technological improvement. The positive effect of outward oriented strategies on economic growth has also been recorded.

Within the framework of endogenous growth model, Bleaney, Gemmell and Kneller (2001) attempt to isolate short run fiscal effects from long run by using panel data for OECD countries during the period 1970-95. They find that productive public expenditure stimulates growth but when education expenditure and health expenditure are separated, there is no evidence of even a smaller effect of this expenditure on economic growth. The results also suggest that previous studies on this issue suffer many drawbacks by estimating the equations using five year average and eliminating the role of budget constraint hence hiding the long run
effects of the fiscal variables. Further, inclusion of the source of finance significantly affects the results and makes the regression coefficients more consistent and reliable.

By using a sample of 37 countries in Africa for the period 1984-1995, Gupta and Verhoeven (2001) investigate the efficiency of government expenditure on health and education and compare their findings with Asian and Western Hemisphere countries. They find a wide variation regarding impact of government expenditure in Africa in terms of output. The comparison also reveals that, as a whole, efficiency in African countries is less than the countries in Asia and Western Hemisphere. No relationship has been recorded between efficiency and level of private spending in Africa and this can be explained in terms of high government wages. Similarly input efficiency and public expenditure are not correlated. Outward shift in the production possibility frontier shows that efficiency of government health and education expenditure has increased since mid 1980s but in relative term average level of productivity remained unchanged relative to Asian and Western Hemisphere countries. It is obvious from regression analysis that government spending on education and health are positively associated with educational attainment and health output. The efficiency analysis recognizes that government spending is more important to determine efficiency. This suggests that in the presence of high initial level of government spending, great caution is required in expanding expenditure on education and health.

Kuhar, Juvancic, Sila and Erajavec (2005) use input-output model to gauge the magnitude and effects of various sources of European Union public expenditure on the region of Peripheral Slovenia. They find that funds have the potential to bring significant contribution
to output increase of the region after the accession while it cannot be verified for the pre accession period. However, the post accession beneficial effects are suggestive and should be considered with caution. In context of regional disparities it is observed that funds affect both regions, Slovenia and peripheral Slovenia, with minor differences.

Mofidi and Stone (1990) point out that employment and investment are negatively and significantly affected when revenues are devoted to transfer payments programmes. Contrary to this, expenditure on health, education and highways are positively related to investment and employment. The findings reveal the presence of a tradeoff between taxes and public expenditure policies because when governments try to increase expenditure on transfer payments in the period of vicious cycle, public expenditure on health, education and highways are crowded out that further depress the economy.

Zaglar and Durnecker (2003) develop a unifying framework to investigate long run effects of public expenditure on economic growth and report that several expenditure categories affect growth directly. They conclude that public expenditure on education and infrastructure stimulates growth.

Barro (1990) highlights that source of public finance significantly determines the impact of public spending on economic growth in developing as well as developed countries. Tax financed public expenditure, mainly income tax on investment, reduce the profit of private agent, and thus impede economic growth. Likewise unproductive expenditure financed through taxes affect growth negatively while productive spending is positively associated with economic
growth. The differentiation between productive and non productive spending has an important role in determining the effects of government budget on investment and growth.

Miller and Russek (1997) analyze the role of debt financed and tax financed public expenditure on economic growth by using fixed effect and random effect models. They conclude that in developing countries public expenditure retards growth when financed through debt while tax financed increases in government expenditure are found to be pro growth. In developed countries debt financed increases in public expenditure has insignificant effect on economic growth whereas growth is negatively affected if this expenditure is financed through taxes.

Bose, Holman and Neanidis (2005) compare the effect of tax financed and money financed government expenditure on economic growth for developed as well as developing countries. They conclude that the stages of development are important for the optimal mode of public finance. In high income countries tax financed government expenditure retard economic growth than if it is financed by printing of money. On the other hand, in low income countries expansion in government expenditure financed with seigniorage retard growth more than if taxes are used to finance this expenditure.

Gupta, Clements, Baldacci and Granados (2005) use a sample of 39 developing countries to examine the effects of fiscal consolidation, public expenditure and the structure of budget on economic growth during the 1990’s. The study supports the existing of a strong linkage between government expenditure reforms and economic growth. Generally fiscal consolidations based on cuts in public spending are pro growth. In addition, fiscal
consolidations exert strong positive effect on growth when they reduce the domestic borrowing needs of the government. One percentage point decrease in deficit to GDP ratio raises, on average, per capita GDP growth by half percentage point in long as well as short-run. The positive effects of fiscal reforms on economic growth are further accentuated when public investment is protected. Reduction in public wage bills has positive association with growth. The initial fiscal conditions of the countries especially the degree of economic stability has a critical role in determining the effects of fiscal adjustments on growth. They also find that relationship between fiscal policy and growth is nonlinear. The findings hold only for the countries who have achieved macroeconomic stability.

Ali (2005) analyzes the relationship between several parameters of fiscal policy and economic growth by using alternative econometric techniques and concludes that fiscal policy as a whole has a significant negative effect on economic growth. Fiscal volatility and fiscal policy uncertainty variables are significantly and negatively correlated with economic growth. When controlling for a set of economic variables, uncertain fiscal policy variables explain a significant portion of differences in growth across countries. In case of government debt, budget deficit, public expenditure and taxes, the effect of fiscal volatility is highly significant but in case of public transfers, grants and revenues the effects turn insignificant. Only trade taxes and government expenditure as fiscal policy instability variables are significantly correlated with economic growth.
2.3: Relationship between Defense Expenditure and Economic Growth:

Each country has to allocate a portion of its resources to its defense requirements depending upon its geo-political importance. Economists are divided on the role of defense spending. Equal number of studies can be found that report positive as well as negative effects of defense expenditure on economic growth. Generally, it is believed that demand side models find negative correlation between defense expenditure and economic growth while the supply side models either find a small positive impact or no impact at all. Moreover, the results remain consistent despite difference in time periods and estimation techniques (Sandler and Hartley, 1995).

Halicioglu (2004) investigates the linkage between military expenditure and the level of economic growth in Turkey for the period 1950-2002 by using co-integration technique. The study supports the existence of a positive long run relationship between aggregate military expenditure and aggregate output in the country. A rise and fall in military expenditure have been closely associated with the changes in equilibrium level of output in Turkey in the study period. This result is in line with the findings of many other studies regarding Turkey.

Using panel data econometrics techniques, Yildirim, Sezgin and Ocal (2005) analyze the impact of military expenditure on economic development for the Middle Eastern countries for the period 1989-99 and conclude that, in general, defense expenditure stimulates economic growth in these countries. In addition, the factor productivity differentials are positive suggesting the more efficiency of the military sector than civilian sector because more modern
technology is used by the military sector in these countries. The findings are in accordance with the empirical literature that supports the positive effect or no effect of military expenditure on economic growth.

Smith (1980) provides a comprehensive analysis regarding defense expenditure and investment in 14 OECD nations for the period 1954-73 and reports negative effect of military spending on investment that favors the crowding out hypothesis of the defense spending. He finds that the estimated coefficient on defense expenditure is not significantly different from -1.

Khilji and Mahmood (1997) use time series data from 1972 to 1995 for Pakistan to analyze the impact of defense expenditure on economic growth employing four different models. They suggest that there exists bidirectional relationship between defense expenditure and economic growth. Pakistan defense burden is negatively associated with Indian defense burden and positively with the government budget. In a broader sense defense burden negatively affects economic growth in Pakistan.

2.4: Tax, Debt and Growth Nexus:

Theoretically, the effects of taxes on economic growth change from insignificant to dramatically large and are highly sensitive to the model structure and the parameters included in the model. Thus theory is unable to provide any conclusive answer about the tax growth nexus. On the other hand empirical evidence is also diverse but not as diverse as the theoretical evidence. The summary of the overall empirical evidence reveals that the effect of taxation is minor in size and insignificant in nature (Myles, 2000).
By using a cross country data, Helms (1985) reports that the impacts of state and local taxes depend on the way these revenues are utilized. When tax revenues are spent on transfer payments then the impact on growth is negative and significant while these taxes become pro growth when utilized to provide social services like roads, health and education.

Koch, Schoeman and Tonder (2005) examines the correlation between fiscal policy and potential economic growth in South Africa for the period 1960-2002 and report that higher taxes are associated with low growth and the current efforts on the part of South African government to decrease taxes may pay economic dividends. The recent cuts in income tax would result in reduction in tax burden and boost the economy. The estimated elasticities associated with tax reduction and tax mix predict that negative effect of tax increase will outweigh the positive effect of decrease in tax burden. Tax effects are not the same across countries and differ significantly in developing and developed countries. The notable difference between developed economies and South Africa is the difference in the calculated negative tax mix elasticity. In addition, tax policies have not been pro growth in South Africa over time.

Employing a sample of rich countries, Folster and Henrekson (2001) conduct a panel study for the period 1970-95 to find the effects of taxes on economic growth. They report robust negative relationship between taxes and growth. A 10 percentage point increase in public expenditure to GDP ratio leads to a decrease of 0.7-0.8 percentage points in economic growth. When they extend their sample to non-OECD countries, the robust negative effects of both taxation and public expenditure do persist. These findings remain significant even
according to the extreme bound criteria. This means that all the regressions show negative and robust effects of taxes on growth.

Barro and Sala-I-Martin (1992) investigate the role of taxes in context of various models of endogenous growth and state that tax policies that encourage investment can stimulate economic growth and increase the utility of representative household provided the rate of social return on investment exceeds the private return. On the other hand if social and private rate of return are equal then investment encouraging tax incentives are not applied. The growth models in which public services are incorporated, the effectiveness of tax policy depends on the characteristics of these services. Different types of public services are subject to congestion such as national defense, public utilities, courts and police services. In this scenario the role of income tax becomes as user fee and, therefore, should be preferred to lump sum tax. Under the lump sum taxation policy, incentives for investment and growth rate increase significantly.

Within the framework of endogenous growth model, Capulapo (2000) finds that productive use of taxes stimulates economic growth. Growth rate continues to grow up to the tax level around 60-70 percent. Spending on education financed through taxation raises growth in such a model where capital accumulation is considered an engine of economic growth. In another way as the growth increases tax revenues also increase that again lead to increase in human capital accumulation.

Adam and Beven (2005) examine the linkage between fiscal deficit and economic growth employing panel data for 45 developing countries for the period 1970-1999 within the
framework of simple overlapping generation (OLG) model of saving behavior. At latter stage they embed this model into endogenous growth model and suggest that the taxes and grants have straightforward effects while the effect of deficit depends on the way how it is financed. When deficit is financed through limited seigniorage it stimulates growth while when financed through domestic debt, it hurts economic growth. A nonlinear relationship is observed between deficit and growth over time in the sample countries. This nonlinearity helps in determining the threshold level of deficit that is around 1.5% of GDP. Up to this level the reduction in fiscal deficit shows positive effect on growth while this effect becomes negative if fiscal deficit is further pushed below the threshold level. The magnitude of this payoff depends on the way how the changes in fiscal deficit are adjusted in the budget. The interaction effects between deficit and debt stock has also been recorded. The high fiscal deficit accompanied by high debt stocks exacerbates the adverse effects of fiscal deficit in terms of economic growth.

Siddiqui & Malik (2001) analyze the debt-growth nexus in three South Asian countries- Pakistan, India, and Sri Lanka-for the period 1975-98 and conclude that debt accumulation has affected growth negatively in these economies. All the debt indicators show significant negative association with growth. They also report the non linear relationship between public debt and economic growth. Current debt to GDP ratio in Pakistan is more than the critical ratio that has deteriorated the economic performance over time. The major causes of high debt burden, in Pakistan, include bad governance, macro imbalances and international market competitiveness. The study suggests that the provision of conducive environment through improved governance may promote economic growth.
Paul (1992) points out that social security and public debt cannot improve welfare in an endogenous growth model contrary to standard overlapping generation model. He argues that public debt depress growth rate and hurts future generations. Although reduction in public debt stimulates economic growth yet it harms the current generation and cannot be Pareto improving. The only suggested policy that can improve the allocation of resources and increase growth rate is an investment or interest subsidy. It is expected that public debt will impede growth as long as savings are negatively correlated with economic growth. Hence the future generation will be penalized. It is also suggested that increase in savings can only be Pareto improving if they are associated with large increase in interest rates.

2.5: Optimal Level of Public Expenditure/Taxes:

The optimal size of government is a relative term. It can vary significantly across countries depending upon the political, geographical, cultural and stages of development. At theoretical and empirical level this issue has been focused in recent years.

Scully (1994) estimates the optimal level of taxes that maximizes the growth rate in the USA. He finds that when the average tax rate is between 21.5 and 22.9 percent of GNP, the growth rate is maximized. Similarly in a recent work\(^4\) he estimates the growth maximizing tax rate as 19.3% of GDP in the USA for the period 1960-1990. He also concludes that though public expenditure contributed to the economic growth of USA yet it was one-fifth as productive as private capital.

\(^4\) Scully (2003).
Using an annual time series data, Gunalp and Dincer (2005) estimate the optimal size of government in case of 20 transition countries for the period 1990-2001. They find that the threshold government size is between 14.3 and 20.3 percent of GDP for the average transition country. Further, it is also found that government consumption expenditure stimulates growth in transition countries.

Chen (2006) tries to find the optimal spending compositions and their relationship with economic growth within the framework of endogenous growth model and reports that under the optimal decision of public spending, economic factors yield stronger growth effects as compare to the conventional wisdom. Optimization induces government to reallocate scarce resources in a better way. Among other differences, in East Asian countries higher ratios of developmental expenditure in government spending have been the major determinants of higher growth rates than other countries in the region.

Barro (1989) examines public expenditure growth-nexus for a sample of 120 countries and concludes that the correlation between the size of government and economic growth is expected to be positive up to a certain level. On the other hand this relationship becomes negative as government size increases beyond this threshold level. This is due to the fact that as government size increases more and more resources are allocated to less and less productive uses. At this stage government involves in the provision of private goods and there is no guarantee that these goods are produced more efficiently than the market forces.

Mavrov (2007) conducts a time series study to analyze the linkage between public spending and rate of economic growth in Bulgaria for the period 1990-2004 by using Army
curve as an analytical tool. With the help of Army curve he also tries to estimate the optimal level of government spending and its different categories. He concludes that the current ratio of public expenditure to total output is above the optimal level and suggests gradual decrease in government spending over time. At disaggregated level of public spending, he also finds optimal level of education, health services and social security.

Benos (2004) points out that in OECD countries hump shaped relationship can be seen between public expenditure on health, education and fuel energy with per capita GDP growth. On the other hand public expenditure on transport, communication and social security show U shaped relation with per capita GDP growth. The effect of public education spending is stronger the poorer a country is and the effect of public health spending is stronger the richer a country is. Budget surplus has positive effect on economic growth in all the OECD countries.

Dar and Amirkhalkhali (1999) analyze the role of government size in determining the impact of different economic variables on economic growth for the Western Hemisphere countries in the context of a general production function. He divides the group of 17 countries into four categories -low, intermediate, intermediate- to- high and high with respect to overall size of the government. The results reveal that capital formation and export expansion are positively associated with economic growth and this result remains valid for countries with large government sectors. The study also indicates that country specific estimates of the coefficient vary across countries.

Pevcin (2004) conducts panel as well as time series study for the 12 European countries to find the optimal level of public spending for the period 1950-1996. He reports that panel
estimates of the Army curve show that the growth maximizing size of government is between 36 and 42 percent of GDP in these countries. This reveals a scope of 19 to 30 percent reduction in the public spending. Time series estimates show that, on average, public expenditure can be reduced by 19 percent of GDP in the 12 European countries.

Vedder and Lowell (1998) point out that in growing economies and emerging nations the role of large governments in context of economic growth is significantly positive. This happens mostly due to the rule of law and enforceable property rights that make environment favorable for investment and reduce transaction cost significantly. In modern times the relative federal government spending in America increased due to the major increase in transfer payments. But such a large transfer payments affect growth negatively both at federal and state level in the United States and in many other countries of the world.

Ohdoi (2007) analyzes the growth effects of fiscal policy by formulating an endogenous growth model with a publically provided productive service and international trade. He finds that growth effects of different categories of taxes depend on the pattern of specialization. An association between rate of income tax and economic growth is either hump shaped or two humps shaped. Further the rate of tax at which the growth is maximized is highly sensitive to the world prices.

Peden (1991) examines the effects of increase in government size on economic growth in the USA and reports that the productivity growth is maximized when government expenditure ranges between 15-20% of GNP. His findings support the classical supply-side paradigm.
Davies (2008) employs data of 154 countries over the period 1975-2002 to estimate the optimal level of public expenditure that maximizes social welfare rather than growth rate. He uses human development index (HDI) as a proxy for social welfare. He concludes that the level of government consumption and investment expenditure, as percent of GDP, at which real per capita GDP is maximized are 8.5% and 6.2%, respectively.

2.6- Conclusion:

This chapter has enlisted the studies who have focused on the causality, nature and size of the effects of government spending on economic growth employing time series and panel sets of data. The findings reveal that Wagner’s law and Keynes hypotheses neither appear to be supported in all studies nor negated completely. The effect of public expenditure on economic growth is positive as well as negative. Roughly speaking, if public expenditure is taken as the share of GDP, it affects growth negatively and if it is used as annual percentage change in the regression model, its effect becomes positive. The tax-growth nexus is also controversial. In some countries taxes are found to be pro growth while in other countries this relation is significantly negative. The correlation between defense spending and economic growth seems to be a paradox. However, general finding is that the linkage between defense spending and growth is negative. If this is the case then why countries make large defense expenditure? The literature is unable to answer this question. Similarly, the empirical findings are unable to present a conclusive estimate of the threshold level of public expenditure that maximizes growth rate of the economy. The estimated optimal size of government ranges from 8 to 39 percent of GDP.
The conflicting results are not surprising due to the varying nature of political and economic systems across countries. It can be stated that the significant differences in results are due to the choice of variables, specification of the model, econometric techniques and nature of the data.
CHAPTER 3
FISCAL SCENARIO IN SELECTED SOUTH ASIAN COUNTRIES
WITH A FOCUS ON PAKISTAN

This chapter briefs fiscal scenario in Pakistan, India, Sri Lanka and Nepal. In section 3.1, economies are introduced individually. Section 3.2 presents a comparative analysis of the fiscal scenario of the sample countries under different headings. Section 3.3 concludes the chapter.

3.1: A Smart look at the Economies of Pakistan, India, Sri Lanka and Nepal:

Developing countries have witnessed mixed trends in their growth rates during the second half of the previous century. The overall performance of the developing economies was much lower as compare to developed economies. South Asian growth scenario also paints a mixed picture and there has been rise and fall in growth path.

3.1.1- Pakistan:

Followed by India, Pakistan is the second largest economy in the region with a population of 160.9 million in 2008 growing at about 1.9% annually. It is a semi-industrialized economy that depends heavily on agriculture, food processing, chemicals and textiles. Deficits, rapid growing population, internal political disputes, swelling debts and costly ongoing confrontation with India have suffered this economy over the decades. Despite enormous obstacles at its inception, it has performed well on many fronts. For example its economy grew
faster than the average growth rate of the world until 1990. However, in respect of debt, deficit, inflation and trade, its performance is not satisfactory.

A historical look at Pakistan’s economy, in respect of policies, political regimes and planning reveals that in the first decade (1947-58) country and economy were settling down from the difficult economic situation that emerged after the partition in 1947. \(^5\) Successive change of governments that ultimately led to dictatorship restricted planners to carve out a Macroeconomic framework for the economy. Consequently, economic performance on many fronts was below average.

In 1958, military takeover of Ayub Khan brought an end to the political turbulence in Pakistan for at least a decade. This decade of sixties is remembered as a period of high economic growth in the history of Pakistan\(^6\) as many sectors particularly agriculture showed enormous growth during this period. \(^7\) Large scale manufacture sector was growing more than 20 percent annually in the first five years of the Ayub rule. Agriculture and industry showed 6 percent and 10 percent growth rates respectively in the second half of the decade long military rule. Despite enormous growth took place in general, it is remembered as a controversial decade due to policies pursued and their economic and political effects. Widening disparity across classes and regions, small increase in real wages and neglected social sector were the

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\(^5\) Poor legacy of banking system and industry put Pakistan in a situation of economic turmoil. The country was facing the daunting task of rehabilitation of migrants that entered Pakistan empty handed.

\(^6\) This era is also called “a decade of development” in the history of Pakistan. The international media mentioned this era in extravagant terms. The New York Times wrote in 1965: “Pakistan may be on its way toward an economic milestone that so far has been reached by only one other populous country, the United States”; the Times of London exclaimed in 1966: “the survival and development of Pakistan is one of the most remarkable examples of state and nation building in the post-war period.” Both quoted in Papanek (1967).

\(^7\) Agriculture sector grew more than 5% per annum in this decade (Pakistan Economic Survey 1968-69).
negative outcomes of the policies perused by the advisory panel led by Dr. Mahbub ul Haq. The trickledown philosophy paid dividends only to the rich and deprived the poor. However, a number of well known economists\textsuperscript{8} still declare it an era of development despite its pitfalls.

In 1971, Pakistan has to face number of economic and social problems after the separation of its Eastern wing now Bangladesh. Zulfiqar Ali Bhutto, with its social reforms and charismatic leadership, uplifted the derailed economy to a significant extent. His social reforms were the natural reactions to the massive income inequalities and concentrated wealth in the hands of industrialists. Impressed by socialism, he believed in the centralized power that could help in spearheading the economy. Hence, there were huge public investments in heavy industries like steel, chemicals and fertilizers. The nationalization of institutions, a trade mark of Bhutto reforms, did not prove as beneficial as expected. Despite many critics on nationalization policy, it is believed that this policy led to some unanticipated useful effects, for example, the diversification of the economy.\textsuperscript{9} Unprecedented devaluation of rupee in 1972 paid dividends in terms of increase in exports only for one year as OPEC decision, in 1973, to increase oil prices over shadowed these dividends by increasing imports bill. In addition, the worldwide stagnation after the 1973 also checked Pakistani exports that led to deterioration of balance of payments. Bhutto’s regime came to an end when Zia ul Haq, a military general, imposed martial law in 1977.

The decade between late seventies to late eighties is the worst ever period in the history of Pakistan. Policies pursued in this era played havoc with the economy and left Pakistan

\textsuperscript{8} Khan, Naqvi and Chaudhary (1989); Hussain (1999); Zaidi (1999).
\textsuperscript{9} The contribution of small scale manufacturing rose from 3.8 to 4.5 percent in this era.
in a position of turmoil and restlessness. All institutions were destructed and economy was run with no specific objectives. So-called Islamization of the economy, proxy war in Afghanistan, leniency towards drug and arms mafia, smuggling, existence of parallel and illegal economy\textsuperscript{10} and tamed democracy were the salient features of this decade that inflicted irremovable effects on Pakistan’s society. However, some economic indicators showed improvement in this regime. Budget deficit remained the major concern of policy makers in this era. Remittances and foreign aid increased significantly. Agriculture credit increased, markets were deregulated that stabilized the price level in agriculture. The agriculture sector showed impressive growth rate mostly due to the high yield of cotton.

The next decade (1988-99) saw four time dissolution of elected parliaments and successive change of governments. At economic front, structural adjustment program was the key feature of this era. Two financial agencies-International Monetary Fund and World Bank-dominated the economic policy making in Pakistan. The most targeted area was the reduction in budget deficit up to 4 percent of GDP through tax increases and reduction in public expenditure. Though the target was not achieved, the society had to pay its cost in terms of higher taxes and massive reduction in development expenditure.\textsuperscript{11} Trade reforms were also a part of this structural adjustment program. The country has to face higher level of unemployment and deterioration of balance of payments when local industries were exposed to foreign competition without providing any proper protection to these units. This era ended in 1998 as a result of 4th military takeover in the history of Pakistan.

\textsuperscript{10} The estimated value of illegal imports was 1.5 billion in the mid 1980s and fiscal burden rose to 8 percent of GDP (Hussain, 1999).
In late nineties, the economic planners of new government paid special attention on the issue of economic crisis\textsuperscript{12}, a legacy of previous government, so that the default of the economy could be avoided. For recovery and revival of the economy a comprehensive reforms\textsuperscript{13} program was launched that encompassed some unpopular decisions such as imposition of sales tax, removal of subsidies and increase in the prices of petroleum. Succinctly speaking, these reforms paid dividends in the form of reduction in debt burden, low inflation rate, and notably the removal of the default risk on foreign debt that seemed unavoidable in 2000-01. But in the first five years of military rule (1999-2004) economy has to pay for all this in terms of low growth rate. However, the second half of this military rule showed exceptional improvements on economic fronts. Whatever the reason was, foreign reserves increased enormously, growth rate showed unprecedented increase and stock exchange rose to a record level.

3.1.2- India:

India is the most populous democracy and 7\textsuperscript{th} largest country, by area, in the world. In the region India is the biggest economy with a GDP of US$1.242 trillion in 2009. It is the 12\textsuperscript{th} largest economy in the world and is ranked second fastest growing economy after china. Indian economy is diverse in nature and has potential to absorb internal as well as external shocks. Despite world financial crisis its growth rate was 6.7\% in the fiscal year 2008-09. It has shown consistency in its growth rate over the years due to its strong macro foundations.

\textsuperscript{12} Atomic explosion in May, 1998 led Pakistan to face economic sanctions from international community that resulted in economic crises.

\textsuperscript{13} These reforms include privatization of financial sector, deregulation and price led market economy.
Until 1991 Indian economy was run under strict regulations and public ownership. Therefore, the growth rate of the economy was slow. But since 1990, it has undergone a number of economic reforms, a result of severe balance of payment crises, particularly continuing economic liberalization. This has paid dividends in shape of high growth rates. Market based system along with revival of reforms in 2000s has listed it among the biggest economies of the world.

In 2009, service industry contributed 62% to the country’s GDP followed by industrial (20%) and agriculture (17.5 %) sectors. The major agriculture products include wheat, cotton, tea and sugarcane while major industries encompass steel, textiles, petroleum and machinery. Its trade volume is expanding on continuous basis. In 2008 its share in international trade rose up to 1.68%.

Despite good performance on growth front, Indian economy faces some challenges like inflation, income inequality and poverty. More than 22% of its population is living below the poverty line and 40% children having less than three years of age are under weight. Similarly 33% of men and women face chronic energy deficiency. However, it is believed that India will emerge as an economic giant with its foundations on vast human and natural resources. Economists predict that GDP of India will surpass US GDP by 2050. However, it is also feared that for decades India will remain a low-income country.
3.1.3- Sri Lanka:

Sri Lanka is another important economy in the region with a GDP of US$ 96.46 billion and growth rate of 3.5% in 2009. Service sector is the largest contributor to its GDP followed by industry and agriculture. In 2009 the respective shares of service, industry and agriculture sectors in GDP were, 58%, 29% and 13%. It is not a diverse economy and heavily depends on a few sectors like tourism and tea exports. Therefore, it is much prone to both internal and external shocks. Its growth history has never been consistent. It has faced a 25 year long civil war that has slowed down its economic growth over the years. In 2001 its growth rate was recorded -1.4. But since 2002 it is showing some signs of recovery.

Poverty, diversification of the economy and debt are the currently major concerns of Sri Lanka. More than 23% of its population is living below the poverty line. In 2001, its debt reached to the alarming level of 101% of GDP and it has to face bankruptcy. However, with an end to civil war in 2009, it is expected that it will perform better in the coming years.

3.1.4- Nepal:

With a GDP of US$ 31.09 billion in 2008, Nepal is among the poorest economies of the world. It has a population of 30 million of which 42% living below the poverty line. Its per capita income is less than US$470. Although only 20% of its area is cultivable, 80% of its population’s principal activity is agriculture. Wheat and rice are the major food crops. The contribution of agriculture to GDP is more than 40 percent. Main industrial activity involves the processing of agriculture products.
Nepal has great potential in its tourism and hydro power sector and recently bulk of foreign investment is being received in these sectors. Tourism industry has suffered much after the 9/11 incident. Further, Maoist conflict has increased the unemployment level in the country. It is interesting to note that international community is funding 60% of its development budget and more than 28% of its total expenditure. This shows the role of international community in its growth.

Like many other developing countries of the world, Nepal also faces challenges like unequal distribution of wealth and poverty. In Nepal, the highest 10% and the lowest 10% of households possess 40% and 2.6% of national wealth respectively. In addition, energy crisis is on rise despite great potential to produce electricity. Years long civil war has also impeded growth over the years.

3.2- An Overview of Fiscal Scenario in Pakistan, India, Sri Lanka and Nepal:

In South Asia, fiscal scenario in all the countries is broadly similar. Small tax to GDP ratios, high level of deficits and small expenditure on social capital are the common features of this region. Table 3.1 presents an overview of the public finances in the selected South Asian countries.
### Table 3.1

**Fiscal Scenario in South Asia (as % of GDP)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pakistan (75-90)</th>
<th>India (75-90)</th>
<th>Sri Lanka (75-90)</th>
<th>Nepal (75-90)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>91-00</td>
<td>01-08</td>
<td>91-00</td>
<td>01-08</td>
</tr>
<tr>
<td>Public Expenditure</td>
<td>24.08</td>
<td>24.23</td>
<td>18.26</td>
<td>18.04</td>
</tr>
<tr>
<td>Deficit</td>
<td>7.36</td>
<td>7.19</td>
<td>3.91</td>
<td>5.73</td>
</tr>
<tr>
<td>Defense Expen.</td>
<td>6.22</td>
<td>5.42</td>
<td>3.15</td>
<td>2.75</td>
</tr>
<tr>
<td>Education Expen.</td>
<td>0.5</td>
<td>0.3</td>
<td>0.28</td>
<td>0.30</td>
</tr>
<tr>
<td>Health Expen.</td>
<td>0.28</td>
<td>0.19</td>
<td>0.14</td>
<td>0.27</td>
</tr>
</tbody>
</table>

**Source:** Government Finance Statistics (Various Issues).

### 3.2.1- Public Expenditure:

Government has to provide goods and services to its population. For this purpose government spends a large amount of its resources on defense, education, health, administration, infrastructure and accomplishment of social and economic activities. Public expenditure shows the preferences of the public authorities over a specified period of time. Recently the role of government has become more critical as many activities have entered in the domain of government. The public expenditure to GDP ratio in South Asian countries is sufficiently large yet its efficiency remains questionable as it could not achieve the desired objectives satisfactorily over the decades.
Figure 3.1 reveals that public expenditure was 24.08 percent of GDP in Pakistan in 1970s and 1980s. The major determinants of this high level of public expenditure were nationalization of institutions and government’s efforts to increase level of employment in the economy. Higher level of defense expenditure and interest payments can also be accounted for this larger size of government in Pakistan during this period. The size of Sri Lankan public sector was the largest (32.83%) in the region for the period 1975-90. The shares of public expenditure in India and Nepal were 18.04 and 15.48 percent of GDP respectively.

In 1990s, Sri Lanka again led the region with the highest level of public spending as a share of GDP. However, public expenditure to GDP ratio decreased significantly in Sri Lanka in this decade. In Pakistan the increasing trend in public expenditure was also arrested due to structural adjustment program of World Bank and IMF. This decrease in public expenditure was on the cost of development expenditure rather than non development expenditure. Indian
public sector also shrank from 18.04 percent in 1980s to 17.15 percent in 1990s. Contrary to other neighboring countries in the region, size of public expenditure swelled in Nepal.

The period 2001-08 shows some interesting trends in respect of public expenditure in South Asia. In Pakistan and Sri Lanka, government spending showed, on average, a significant decline while in India and Nepal share of public expenditure increased. The fundamental reason behind squeezing public sector in Pakistan is the resource crunch that forced government to reduce government size. However, recently public expenditure is showing an upward trend in Pakistan as government has to bear huge cost of civil war in its western parts.

3.2.2- Current and Development Expenditure in Pakistan:

Trends in different components of public expenditure in Pakistan reveal that rising trend of current expenditure has been arrested in recent years. This has happened mainly on account of declining interest payments and defense expenditure that together constitute a large portion of current expenditure. Interest payments that accounted for 2.1 percent of GDP in early 80s reached the unsustainable level of 7.5 percent in late 1990s. However, since 2000 interest payments are showing a consistent decline.
Figure 3.2 shows that development expenditure stood at 9.3 percent of GDP in 1980, the highest level in the last three decades, and started declining gradually onwards. In 2001, development expenditure touched the lowest level of 2.3 percent of GDP. It has been showing substantial recovery since 2002 and reached up to the level of 5.6 percent. This reveals that government has recognized the importance of social spending and is committed to direct resources towards physical and human capital.

3.2.3 - Public Revenues:

To meet its expenditure government has to generate revenues. An efficient tax system guarantees the smoothly functioning of government activities. Empirical evidence shows that tax to GDP ratio in developing countries is far less than the international standards.\textsuperscript{14} According to World Bank (2005) report, the revenue to GDP ratio in developing countries was only 13

\textsuperscript{14} Scully (1994, 1996) estimates the optimal tax rate for US and New Zealand as 23 and 19.7 percent of GDP respectively.
percent in 2004. Several factors are held responsible for this low revenue to GDP ratio. These encompass ineffective tax systems, capital flight to tax free zones, tariff reduction and trade liberalization, weak tax authorities and persisting parallel illegal economies.

**Figure 3.3**

Public Revenues Trajectories in South Asian Countries (as % of GDP)

![Figure 3.3](image)

**Source:** Government Finance Statistics (Various Issues).

Figure 3.3 shows mix trends of revenues across selected South Asian countries. In India and Pakistan revenue to GDP ratio is broadly similar. In both countries public revenue to GDP ratio increased in 1990s as against 1970s and 1980s. However, this ratio has declined in the first eight years of the current century. On the other hand, in Nepal revenue to GDP ratio has been increasing since 1975. This shows the commitment on the part of Nepalian authorities to enhance fiscal space. Sri Lanka is a country with highest revenue to GDP ratio in the region. It has been leading in South Asian economies in revenue to GDP ratio since 1975. Despite its supremacy in revenues, it has been witnessing continuous decline in its revenues as a percent of GDP since 1970s.
3.2.4-Tax Revenues:

Taxes constitute a bulk of public revenues and play a significant role in economic development of a country. Over time tax revenues show a disappointing picture in the South Asian economies. Political instability, well rampant tax evasion and narrow tax base are the major factors of low tax to GDP ratio in the region. Successive governments had made high claims to enhance tax to GDP ratio but failed to achieve the required level. Currently, tax to GDP ratio in this region is very small as compare to European Union.\textsuperscript{15}

Figure: 3.4

Tax Revenues in Pakistan, India, Sri Lanka and Nepal (as % of GDP)

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{tax_revenues.png}
\caption{Tax Revenues in Pakistan, India, Sri Lanka and Nepal (as % of GDP)}
\end{figure}


Figure 3.4 clearly states that South Asian economies have been deficient in tax revenues. It is interesting to note that despite many similarities in the sample, tax to GDP ratio shows different trends across countries. Like public revenues, tax to GDP ratio has been the highest in Sri Lanka and it is on continuous decline since 1970s. Contrary to this, tax to GDP ratio in this region is very small as compare to European Union.\textsuperscript{15}

\textsuperscript{15} In European Union tax to GDP ratio is between 24 and 44 percent (Baig, 2009).
ratio is showing an upward trend in Nepal over time. In India the behavior of taxes is mixed. It declined in 1990s but is getting momentum since 2001. Pakistan tax to GDP ratio remained, on average, constant from 1970s to 1990s. However, it declined sharply in the last eight years.

3.2.5- Direct and Indirect Taxes in Pakistan:

A deep look at tax revenues in Pakistan reveals that the indirect taxes constitute a large proportion of total tax revenues. In late seventies the share of indirect taxes was five times greater than direct taxes that swelled up to more than six times in late eighties. But in the last two decades the gap between direct taxes and indirect taxes has reduced remarkably. In 2006 the share of indirect taxes in total tax revenues was only just more than double the share of direct taxes. Needless to add, it is distressing to see that share of direct taxes in Pakistan only accounts for 3% of GDP while in other developing counties this ratio is as high as 7%.\(^{16}\)

**Figure 3.5**

*Direct versus Indirect Taxes in Pakistan (as % of GDP)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Indirect Taxes</th>
<th>Direct Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>9.94</td>
<td>1.92</td>
</tr>
<tr>
<td>1987</td>
<td>12.55</td>
<td>1.94</td>
</tr>
<tr>
<td>1998</td>
<td>9.32</td>
<td>3.93</td>
</tr>
<tr>
<td>2006</td>
<td>7.63</td>
<td>2.95</td>
</tr>
</tbody>
</table>

*Source: Economic Survey (2007-08), Ministry of Finance, Pakistan.*

\(^{16}\) Economic Survey (2007-08), Ministry of Finance, Pakistan.
3.2.6- Tax Structure in Pakistan:

Tax structure in Pakistan has undergone a paradigm shift due to tax and tariff reforms that started in early 1990s. Dependence on foreign trade taxes is gradually decreasing while share of direct taxes is increasing sharply over time. Reduction in excise duties and narrowing of excise net has reduced its share significantly. Share of sales tax, on the other hand, has been increasing sharply. Pakistan’s tax system resembles the one that was practiced in Latin American countries.\(^\text{17}\)

**Figure 3.6**

Tax structure in Pakistan (as % of Total Tax Revenues)

<table>
<thead>
<tr>
<th>Year</th>
<th>Direct Taxes</th>
<th>Custom</th>
<th>Sales</th>
<th>Excise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-77</td>
<td>17%</td>
<td>37%</td>
<td>8%</td>
<td>38%</td>
</tr>
<tr>
<td>2005-06</td>
<td>32%</td>
<td>19%</td>
<td>41%</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Source: Economic Survey (2007-08), Ministry of Finance, Pakistan.*

Figure 3.6 clearly brings out that share of direct taxes in total revenues has increased significantly over the years. It increased from meager 17% in 1977 to a substantial 32% in 2006. Within indirect taxes the share of sales tax has increased five times in the last three decades.

\(^{17}\) In Latin American countries indirect taxes particularly sales tax contributes relatively high to the overall tax revenues.
3.2.7- Fiscal Deficit:

An adequate level of revenue generation is extremely essential for a state to meet expenditure obligations whereas dearth of revenue collection directly affects the state’s position and provision of socially desirable infrastructure. Many of the developing countries especially in South Asia and Africa are facing a mismatch in revenues and expenditure and having high deficits since long.

Succinctly speaking, fiscal deficit is the gap between total expenditure and total revenues in a fiscal year. These nations have born high cost of fiscal deficits in terms of deterioration of macro-indicators like interest rate, current account deficits and public debt. The factors that contributed to this persistent high level of fiscal deficits are now an open secret. It includes lack of serious efforts on the part of governments to generate revenues to meet rising expenditure.

Pakistan, India, Sri Lanka and Nepal are also facing the menace of high fiscal deficits. Both current account deficits and fiscal deficits show a dismal picture. In 2001, fiscal deficit rose up to an unsustainable level of more than 10 percent of GDP in Sri Lanka. Pakistan has also been facing deficits since its inception in 1947. Contrary to Sri Lanka and Pakistan, India and Nepal faced comparatively less severity of fiscal deficits due to their effective management of public expenditure and revenues.

Fiscal deficits have been an issue of concern for the authorities in the developing economies. Many efforts have been made on the part of authorities to mitigate this challenge. In addition to these efforts, since 1990s IMF has also taken up this issue on priority basis. In Pakistan these efforts have paid dividends as in the last eight years fiscal deficit has shrunk to
less than 4% of GDP.\textsuperscript{18} This reduction in fiscal deficit is an outcome of improved revenues and parsimonious use of public spending.

\textbf{Figure 3.7}

\begin{center}
\textbf{Fiscal Deficits of South Asian Countries (as \% of GDP)}
\end{center}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig3_7.png}
\caption*{Source: Government Finance Statistics (various issues).}
\end{figure}

Figure 3.7 shows that 1980s was the worst ever decade in respect of fiscal deficit in South Asia. Fiscal deficit was more than 6\% in each country in this period. Contrary to 1980s, the last eight years can be said an era of less fiscal deficits. In Pakistan and Nepal fiscal deficits decreased sharply during the period 2001-2008 and shrunk to sustainable level. However, in India and Sri Lanka the level of fiscal deficit is still very high and has started rising again.

\textsuperscript{18} In 2004-05 fiscal deficit in Pakistan shrunk to 3.3 percent of GDP.
3.2.8- Defense Expenditure:

The strategic importance and vested interest of the big powers have made South Asia a highly important region during the last 35 years. The dramatic changes in the political and strategic scenario in the recent past have increased its importance many fold. Among the developing countries this region allocates a huge amount of scarce resources toward its military expenditure. In addition to civil wars in these countries, the dispute of Kashmir between the two bigger economies of the region, Pakistan and India, is the major cause of this high level of defense expenditure.

Pakistan allocates the highest share of its GDP on defense expenditure in South Asia followed by India, Sri Lanka and Nepal. Defense expenditure in Pakistan and India is decreasing and shows similar trend over time. However, in Sri Lanka defense expenditure does not exhibit a specific trend while in Nepal it is showing a trend contrary to Pakistan and India.

Up to 1990 Pakistan defense expenditure was, on average, as high as 6% of GDP, a very high ratio from all respects. In the next ten years (1991-2000) defense expenditure started decreasing gradually. Since 2001, defense expenditure has scaled down from 5.42 percent to 3.15 percent of GDP in 2008, a decrease of remarkable 42 percent.

India also directs a huge amount of resources toward its defense needs. However, on average, Indian defense expenditure express a gradual decrease over the last 35 years. Currently the share of defense expenditure has shrunk from 2.75 percent of GDP in 1980s to 2.21 percent of GDP in 2008. At present both the nations, Pakistan and India, are spending almost the similar share of their GDP on defense expenditure.
Sri Lankan defense expenditure has been more volatile in the region during the last forty years. Till 1990, on average, defense expenditure was less than one percent of GDP. However, from 1991 to 2000 defense expenditure rose up to more than 3 percent of GDP. The government commitment to handle civil war gave birth to this high level of defense expenditure in the country. The last decade has seen a sharp decline in defense expenditure in Sri Lanka. Contrary to other economies of the region, defense expenditure in Nepal shows a continuous increase over the last four decades. Despite this, it is still able to manage its defense expenditure less than 2 percent of GDP. This provides authorities with the opportunity to allocate more resources toward human capital.
3.2.9- Public Education Expenditure:

It is well acknowledged by all economists that education has a vital role in economic development of a nation. It strengthens the economic base through knowledge and skills that in turn accelerates economic growth. Awareness, tolerance and self esteem are the outcomes of proper education that enable people to defend their rights. Individuals as well as society reap the benefits of education. According to World Bank (2002) report, each year of additional schooling leads to 10% increase in individual’s wage globally. Therefore, economic growth is a necessary but not sufficient condition for social development.

Despite its immense importance, public education expenditure in South Asia paints a dismal picture particularly in case of Pakistan and India. The two bigger economies of the region have never been able to increase public education expenditure even up to 1 percent of GDP. Pakistan and India remained unable to translate their impressive average growth rates benefits into a satisfactory level of human capital over the last sixty years. Throughout their entire history, policy makers solely focused on achieving higher economic growth. Thus social sector was the most neglected sector and public investment in education was small and inadequate to provide proper education to population. In addition, public expenditure on education was skewed toward higher education benefiting the upper income class in Pakistan. The primary education presents even worse scenario. However, it is encouraging to note that public expenditure on education is on rise since 2000 in these economies.
Sri Lanka has been leading the region by spending more than 2 percent, an impressive figure for a developing country, of GDP in education sector in the last four decades. This is interesting to note that public expenditure on education in Sri Lanka has been volatile throughout its entire history. Currently this ratio is just below than 3 percent and shows government commitment to educate its population despite its internal problems notably high debt burden and civil war with Tamil Tigers.

Nepal, despite its low tax revenues has been spending more than one percent of its GDP on education sector. Currently, Public education expenditure to GDP ratio improved from less than 1% in 1975 to almost 3% in 2008. It is clear that the two smaller economies of the region have left bigger economies far behind on education front.
3.2.10- Public Health Expenditure:

Health scenario in South Asia is not much different from educational scenario and paints even a worse picture particularly in Pakistan and India. In Pakistan despite an overall impressive economic development, health sector could not get proper attention of the authorities. Indicators like life expectancy and infant mortality rate are far below than international levels of social service delivery. Total government spending on health, as a share of GDP, were low as compare to other low income countries and never touched the level of even one percent of GDP. Low earnings and increasing size of defense budget forced Pakistan to spend fewer resources on health.\(^{19}\)

**Figure 3.10**

Public Health Expenditure in South Asia (as % of GDP)

![Diagram showing public health expenditure in South Asia](source: Government Finance Statistics (various issues)).

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\(^{19}\) On the human poverty index, Pakistan ranked 77\(^{th}\) among 108 countries and 136\(^{th}\) among 177 countries on the human development index (Akram, Pada and Khan, 2008).
India spends a meager amount on social services especially health. In the last thirty years, in India, the government spending on health measured as a percent of GDP remained as low as 0.27 showing the failure of state to provide adequate health facilities to its mass population. In Nepal, health expenditure scenario shows an improved picture than India and Pakistan. The average health expenditure in Nepal remained three times higher than the two bigger economies of the region. Sri Lanka has been leading the South Asian nations with an impressive percentage of public health expenditure over the last three decades. Sri Lankan government continues to spend more than 1.5 percent of GDP to provide health services to its people.

3.3- Conclusion:

The fiscal scenario in Pakistan, India, Sri Lanka and Nepal resembles with small differences. Low tax to GDP ratio, large share of indirect taxes, high debt burden, swelling fiscal deficits, high level of defense expenditure and low public investment in physical and human capital are the common and salient features of all four economies. Pakistan, India and Nepal fall in low income group while Sri Lanka enjoys the status of a middle-income country.20

The major reasons for low tax collection are the tax evasion, complex tax collection system and lack of proper monitoring procedure. This low level of tax revenue has forced governments to borrow from both internal and external sources. Therefore, increased debt to GDP ratio has affected these economies severely particularly Sri Lanka who defaulted on its debt in 2001. Likewise, the large share of indirect taxes has affected the low income groups

20 World Development Indicator (2008).
and has created unrest in the general public of these countries. Fiscal deficits are also the outcomes of this low tax to GDP ratios as governments are unable to meet even their necessary expenditure from tax revenues.

High level of defense expenditure is also a major concern for these nations as it eats up the substantial portion of revenues every year. The decades long dispute of Kashmir between India and Pakistan is the major cause of high defense expenditure in two bigger economies of the region. In addition, all the four countries have been facing civil wars on different time periods of their history. Resultantly, human capital is a neglected sector in this region particularly in Pakistan and India. Despite low revenues two smaller economies, Sri Lanka and Nepal are performing well on human capital front.

Easy and simple tax collection procedure, increase in the share of direct taxes, widened tax base and proper monitoring procedure can improve the currently low tax to GDP ratio in the region. Political solution of internal disputes can decrease the share of unproductive defense expenditure that will ultimately leave authorities with more revenues to address human capital. Sky-rocketing public debts can be arrested by curtailing the size of governments.

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21 Taliban and ethnic disputes in Pakistan, Sikh movement in India, Maoists in Nepal and Tamil Tigers in Sri Lanka have engaged their respective governments in civil war over the years.
CHAPTER 4

KEYNES VERSUS WAGNER: AGGREGATED AND DISAGGREGATED ANALYSIS OF PUBLIC EXPENDITURE

This chapter examines the direction of influence between government spending, its sub components and per capita GDP in selected South Asian countries. It is expected that the results obtained in this chapter will provide basis for the further analysis on the expenditure-growth nexus. The empirical literature, generally, shows that growth in government spending cannot be determined by the growth in economic activity in many of the developing countries (Sinha 1998). This shows that non economic factors can be the determinants of government spending growth in the developing world. The analysis will show that whether or not public expenditure, its sub components and per capita GDP are co-integrated in South Asian region. Engel Granger (1987) co-integration technique is used to investigate the long run relationship between public expenditure, its sub components and economic development. Error Correction Mechanism (ECM) is used to determine the short run dynamics between the co-integrated variables while Granger causality test is used to know the direction of flow between non co-integrated variables.

The chapter proceeds as follows. Section 1.4 provides detailed introduction of the issue. Section 4.2 presents different functional forms of the Wagner’s law that have been empirically tested in literature. Section 4.3 deals with data and variables. Section 4.4 describes the econometric methodology. It explains the process of ADF unit root, Engel Granger co-integration technique
and Granger causality test. Section 4.5 comprises estimation and results. The last section, 4.6, concludes the chapter.

4.1- Introduction:

The relationship between public expenditure and economic growth is one of the most controversial topics in Macroeconomics. An extensive literature exists that examines this relationship theoretically as well as empirically. Within this literature one brief strand of literature addresses the issue of causality between public expenditure and economic activity. The results are inconclusive and diverse in nature and significance. Two different rather opposite views with valid arguments in favor of their hypotheses exist; the Keynesian and the Wagnerian.

The Keynesian doctrine believes that causality runs from public expenditure to economic growth and treats public expenditure as exogenously determined. The use of public expenditure as an instrument to affect economic growth and correct short run fluctuations is advocated by this doctrine. Empirically this hypothesis is supported by Bird (1970), Beck (1979), Ansari (1993), Cheng and Lai (1997) and Biswal et al (1999).

Contrary to Keynesian view, the Wagnerian argues that growth in public expenditure is an outcome of growth in economic activity. Empirical work by Gupta (1967), Beck (1981) and Ahsan, Kwan and Sahni (1996) find evidence in favor of Wagner’s hypothesis. In addition, Musgrave (1969), Mann (1980), Ram (1987), Holmes and Hutton (1990) find either no support or mixed support while analyzing these hypotheses.
The empirical work engaged in testing these hypotheses employs cross sectional as well as time series data. But cross sectional studies about the Wagner’s and Keynes hypotheses are considered less reliable as Bird (1971) makes the following observations about the cross section studies: “there is nothing in any conceivable formulation of Wagner’s law which tells us country A must have a higher expenditure ratio than country B simply because the level of average per capita income is higher in A than B at a particular point in time.” (p. 10). On the other hand time series studies are considered more handy and useful for testing Wagner’s hypothesis. However, time series studies have only concentrated on aggregated level of public expenditure and have limited implications.

In this chapter we test Keynes versus Wagner’s hypothesis using aggregated as well as disaggregated data on public expenditure for the period 1975-2008. The decomposition of public expenditure into sub components may provide broader implications for the policy makers.

4.2- Functional Forms of Wagner’s law:

Different versions of Wagner’s law have been extensively tested for different countries since 1960. However, the following six interpretations of Wagner’s law have gained much popularity among the researchers over the last five decades.

\[ GE = f(GDP) \]  
Peacock-Wiseman (1961)

\[ GCE = f(GDP) \]  
Pryor (1968)

\[ \frac{GE}{GDP} = f(GDP) \]  
Mann (1980)
Where GDP is gross domestic product, GE is total government expenditure, GCE denotes government consumption expenditure and N is population. The major differences among these six versions are measures of government size and the economy. Peacock (1961) and Goffman (1968) measure government size by total government expenditure, Mann (1980) and Musgrave (1969) by total expenditure as a share of GDP, Pryor (1968) by government consumption expenditure and Gupta (1967) by per capita government expenditure. To measure economy, Peacock, Pryor and Mann use GDP while Goffman, Gupta and Musgrave make use of per capita GDP. Empirical evidence reveals that economists prefer the Musgrave (1969) version to test validity of Wagner’s law22 as per capita GDP is usually regarded as the single most representative index of development.23 Similarly, government size is best represented when measured as a share of GDP. Hence, following this practice we also use this formulation for testing Wagner’s hypothesis in case of Pakistan, India, Sri Lanka and Nepal.24 To test Keynesian hypothesis, in our selected functional form we express per capita GDP as a function of government expenditure/its sub component as under;

\[
\frac{GDP}{N} = f\left(\frac{GE}{GDP}\right)
\]

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22 Halicioglu (2003).
24 Unavailability of data forced us to exclude Bangladesh from our sample.
4.3- Data and Variables:

Annual time series data for four countries; Pakistan, India, Sri Lanka and Nepal is employed to test Wagner’s versus Keynes hypothesis both at aggregated and disaggregated level of public expenditure. The variables used in this chapter come from two major sources:

1- World Development Indicators (WDI) CD Rom (2009), a product of World Bank.

2- Government Finance Statistics (GFS) different issues, a publication of International Monetary Fund (IMF).

Five series namely, per capita GDP, public expenditure, defense expenditure, public education expenditure and public health expenditure are used in the analysis. Public expenditure and its sub categories are taken as a share of GDP.

4.4- Econometric Methodology:

Wagner’s law/Keynes hypothesis is verified if per capita GDP and government expenditure are linked in the long run. It requires testing for co-integration between the variables. Co-integration requires that all the variables are integrated of the same order. Therefore, all variables are tested for unit root to check stationarity and to determine their order of integration.

4.4.1- Unit Root:

It has become a norm in empirical literature to test a series for stationarity since the presence of a non stationary series in the regression model invalidates many of the standard
hypothesis tests and may lead to spurious results. Hence, before conducting any estimation procedure unit root test is applied to know whether the series are stationary or non-stationary. Testing for the presence of unit root also provides statistical sense of combining two variables in a regression equation. Several tests of stationarity are available in literature. In this study we apply the Augmented Dickey-Fuller (ADF) test as it is extensively used in literature.

Augmented Dickey-Fuller (1979) test is based on the t-ratio of the following regression;

\[ \Delta Y_t = \beta Y_{t-1} + \sum_{i=1}^{n} \gamma_i \Delta Y_{t-1} + \mu_t \] .......................... (4.1)

Where \( \Delta \) is the first difference operator, \( Y_t \) is the series under consideration. \( \beta \) & \( \gamma \) are the regression coefficients to be estimated and \( \mu_t \) is a white noise error term, \( n \) is large enough to ensure that the error term is white noise. The above equation tests for unit root without intercept and deterministic trend. The test can also be performed either in the presence of intercept and linear trend or both. For this purpose the above equation can be extended in the following way.

\[ \Delta Y_t = \alpha_0 + \beta Y_{t-1} + \sum_{i=1}^{n} \gamma_i \Delta Y_{t-1} + \mu_{1t} \] .......................... (With intercept)........................................ (4.2)

After inclusion of intercept and linear trend equation (4.1) can be written as under:

\[ \Delta Y_t = \alpha_0 + \alpha_1 t + \beta Y_{t-1} + \sum_{i=1}^{n} \gamma_i \Delta Y_{t-1} + \mu_{2t} \] .......................... (With intercept and trend)............................. (4.3)

---

25 Granger and Newbold (1974) have found by simulation that F-statistics calculated from a non-stationary time series data does not follow the standard distribution. The significance of the test is overstated and consequently spurious results are obtained.


27 We perform ADF unit root test on constant, constant and linear trend at level and first difference of variables.
$\mu_{1t}$ & $\mu_{2t}$ are white noise error terms.

The following are the null and alternate hypothesis:

$$H_0: \beta = 0$$

$$H_1: \beta < 0$$

The null hypothesis is rejected when $\beta$ is significantly negative. A series is considered to contain a unit root if the null hypothesis of non stationarity is not rejected.

$t$ statistics for $\beta$ is as follow:

$$t_{\beta} = \frac{\hat{\beta}}{se(\hat{\beta})}$$

Where, $\hat{\beta}$ is the estimated value of $\beta$ and $se(\hat{\beta})$ is the standard error of $\hat{\beta}$.

The advantage of the ADF test is that it is even valid in the presence of moving average (MA) component. It is true when the sufficient lagged terms of the dependent variable are included in the test regression.\textsuperscript{28} Determination of lag length, $n$, in conducting ADF test is very critical. The inclusion of too few lags changes the size of the test in an unknown manner and if too many lags are introduced, the power of the test is reduced. Hence, in this study Schwarz Information Criterion (SIC) is applied to determine lag length.

\textsuperscript{28} Said and Dickey (1984).
4.4.2- Co-Integration

Regression of two non stationary series or one stationary and other non stationary series, if estimated by Ordinary Least Square (OLS), produces spurious results. Empirical literature comes with two solutions to avoid spurious regression phenomenon. First is to take first difference of the variables to make them stationary and then apply OLS. The second is to test long run relationship between the variables using non stationary series. In this chapter, we use co-integration as we are interested in the long run behavior of the variables.

Co-integration reveals long run relationship between the variables. Empirical literature provides two prominently discussed methods of testing co-integration; the Engel Granger (1987) methodology and The Johansen (1988) procedure. In this chapter we use Engel Granger approach to test Wagner’s law/Keynes hypothesis. Followed by co-integration procedure, we apply ECM to determine the short run dynamics of the regression model. The ECM determines the causality between the variables indirectly.

4.4.2.1- Engel Granger Co-integration Test:

This methodology is a three step procedure that can be stated as under:

Step 1:

Co-integration analysis requires as pre condition that the variables are integrated of order one. Therefore, in the first step order of the variables is tested. If the variables are integrated of order zero i.e., \( I(0) \) then OLS is the reliable method for the estimation of regression coefficients. On the other hand if variables are integrated of order one, non stationary, the
procedure enters into the next step to test long run relationship, co-integration, between the variables.

**Step 2:**
After ensuring that the variables are $I(1)$, public expenditure or its sub component is regressed on per capita GDP. The general form of the regression equation is as under:

$$ln(G_t) = \alpha + \beta ln(Y_t) + \varepsilon_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (4.5)$$

Where $G_t$ represent government expenditure or its sub category, $Y_t$ per capita GDP, $\varepsilon_t$ an error term and $ln$ natural logarithm respectively. For verification of Keynes hypothesis, we specify above equation with $Y_t$ as a function of $G_t$. All variables are used in natural logarithmic form.

The regression residuals obtained from equation (4.5) are tested for the presence of unit root by using ADF unit root test. If the residual are stationary at level i.e., $I(0)$ then it is concluded that the variables are co-integrated. Put differently there exists a long run relationship between the variables or variables are moving together in the long run. It is interesting to note that despite two variables are individually non stationary their linear combination may be stationary. It is due to the fact that linear combination cancels out stochastic trends between the two non stationary series.

29 Public expenditure is decomposed into defense expenditure, public education expenditure and public health expenditure.
30 We use critical values suggested by Charemza and Deadman (1997), as usual t-values become invalid in case of residuals.
Step 3:

The information that the residuals are stationary only states that the variables are linked or they are moving together in the long run. Of course there may be disequilibrium in the short run. Therefore, to determine the short run relation, error term is treated as the equilibrium error. According to Granger representation theorem, if two variables say X and Y are co-integrated, then the relationship between X and Y can be expressed as ECM.

The ECM states that the lagged values of the dependent variable depend on the lagged values of the exogenous variable plus the equilibrium error term. The coefficient attached to the error term is expected to be negative that will restore the equilibrium. The speed of the restoration of the equilibrium depends on the absolute value of the coefficient assigned to the error term.

4.4.3- Causality:

It is possible that the variables are not linked in the long run yet they may cause each other in the short run. Hence, to see the short run causality between the non co-integrated variables, standard Granger causality test is applied.

4.4.3.1- Testing for Causality:

First the following question is imposed: Is it per capita GDP that causes public expenditure/its sub component or is it public expenditure/its sub components that causes per capita GDP? The Granger causality test suppose that information necessary for the prediction
of the respective variable is solely contained in the time series data on these variables. The test involves the estimation of the following two equations:

\[
Y_t = \sum_{i=1}^{n} \beta_i G_{t-i} + \sum_{j=1}^{n} \gamma_j Y_{t-j} + \epsilon_{1t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (4.6)
\]

\[
G_t = \sum_{i=1}^{n} \pi_i G_{t-i} + \sum_{j=1}^{n} \theta_j Y_{t-j} + \epsilon_{2t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (4.7)
\]

Where \( \epsilon_{1t} \) and \( \epsilon_{2t} \) are uncorrelated. In respect of causality the following four scenarios can emerge;

1- The causality runs from \( G \) to \( Y \) (\( G \rightarrow Y \)) and the relationship is strictly unidirectional. For this it is necessary that; \( \sum \beta_i \neq 0 \) & \( \sum \theta_j = 0 \) meaning that the coefficients on the lagged values of \( G \) in equation (4.6) are statistically significant while coefficients on the lagged values of \( Y \) in equation (4.7) are insignificant.

2- The causality is again unidirectional but now it runs from \( Y \) to \( G \) (\( Y \rightarrow G \)). It occurs if; \( \sum \beta_i = 0 \) & \( \sum \theta_j \neq 0 \).

3- Bidirectional causality (\( G \leftrightarrow Y \)) exists if the sets of \( G \) and \( Y \) coefficients in both the regressions are statistically different from zero.


\[32\] \( G_t \) & \( Y_t \) are government expenditure/its sub components and per capita GDP respectively.
4- If in both regressions the coefficients on the lagged values of G and Y are not statistically different from zero then G and Y are independent. In other words neither G causes Y nor does Y cause G.

4.5- Estimation and Results:

In this section estimation is performed on the basis of econometric methodology discussed in section 4.4. To analyze whether public expenditure, at aggregated as well as disaggregated level, in Pakistan, India, Sri Lanka and Nepal follows Wagner’s law or supports Keynes hypothesis, requires testing for co-integration between the variables. Testing for co-integration necessitates that the variables are integrated of order one. Therefore, all variables are tested for unit root to determine their order of integration. ADF unit root test is applied on per capita GDP, public expenditure, defense expenditure, public education expenditure, and public health expenditure series. The ADF unit root test results are presented in table 4.1.
Table 4.1
ADF Unit Root Test Results for Pakistan, India, Sri Lanka and Nepal
Null Hypothesis: The series has a unit root.

(At Level)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pakistan</th>
<th>India</th>
<th>Sri Lanka</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>C &amp; T</td>
<td>C</td>
<td>C &amp; T</td>
</tr>
<tr>
<td>Per Capita GDP</td>
<td>-1.50</td>
<td>-1.66</td>
<td>2.23</td>
<td>-1.71</td>
</tr>
<tr>
<td>Total Public Expenditure</td>
<td>-0.87</td>
<td>-1.73</td>
<td>2.21</td>
<td>-2.15</td>
</tr>
<tr>
<td>Defense Expenditure</td>
<td>0.14</td>
<td>-1.19</td>
<td>-1.81</td>
<td>-1.64</td>
</tr>
<tr>
<td>Public Education Expenditure</td>
<td>-1.94</td>
<td>-2.20</td>
<td>-0.15</td>
<td>-2.33</td>
</tr>
<tr>
<td>Public Health Expenditure</td>
<td>-1.66</td>
<td>-2.67</td>
<td>-2.28</td>
<td>-2.35</td>
</tr>
</tbody>
</table>

(At First Difference)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pakistan</th>
<th>India</th>
<th>Sri Lanka</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>C &amp; T</td>
<td>C</td>
<td>C &amp; T</td>
</tr>
<tr>
<td>Per Capita GDP</td>
<td>-4.17*</td>
<td>-4.32*</td>
<td>-5.21*</td>
<td>-6.05*</td>
</tr>
<tr>
<td>Total Public Expenditure</td>
<td>-6.49*</td>
<td>-5.27*</td>
<td>-4.80*</td>
<td>-4.67*</td>
</tr>
<tr>
<td>Defense Expenditure</td>
<td>-4.91*</td>
<td>-5.03*</td>
<td>-4.67*</td>
<td>-4.63*</td>
</tr>
<tr>
<td>Public Education Expenditure</td>
<td>-8.15*</td>
<td>-8.07*</td>
<td>-4.28*</td>
<td>-4.34*</td>
</tr>
<tr>
<td>Public Health Expenditure</td>
<td>-6.11*</td>
<td>-6.01*</td>
<td>-6.24*</td>
<td>-6.14*</td>
</tr>
</tbody>
</table>

Note: C and T denote Constant and Trend respectively. * Null is rejected at 1% level.

It is clear from table 4.1 that the null hypothesis of non stationarity cannot be rejected at level but can be rejected at first difference of the variables for all the countries. This implies that all the variables are integrated of the same order i.e. $I(1)$. The unit root analysis provides

33 Critical values are provided in appendix I.
basis for testing co-integration. Engel Granger (1987) co-integration test is applied according to the procedure discussed earlier by estimating equation (4.5). The residual based co-integration results are presented in table 4.2.

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Pakistan</th>
<th>INDIA</th>
<th>Sri Lanka</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Expenditure</td>
<td>-1.46</td>
<td>-2.21</td>
<td>-3.16***</td>
<td>-2.44</td>
</tr>
<tr>
<td>Defense Expenditure</td>
<td>-0.87</td>
<td>-1.69</td>
<td>-1.52</td>
<td>-2.09</td>
</tr>
<tr>
<td>Public Education Expenditure</td>
<td>-2.28</td>
<td>-1.92</td>
<td>-2.61</td>
<td>-3.24***</td>
</tr>
<tr>
<td>Public Health Expenditure</td>
<td>-2.40</td>
<td>-2.51</td>
<td>-2.82</td>
<td>-2.58</td>
</tr>
</tbody>
</table>

Note: The critical values are -3.90, -3.34 and -3.04 for 1%, 5% and 10% respectively. Critical values are from Charemza and Deadman (1997) *** Null is rejected at 10% level.

After unit root analysis and co-integration test, results of each country are discussed separately.

4.5.1- Pakistan:

The results reported in table 4.2 reveal that the null hypothesis of non-stationarity of residuals cannot be rejected at conventional levels of significance. The results suggest that there exists no long run linkage between government spending, its sub categories and per capita gross domestic product in Pakistan. It can be concluded that public expenditure and per capita GDP are not moving together in the long run. The findings that emerge from co-integration analysis are in line with the findings of many studies. For example Huang (2006)
analyzes Wagner’s law for China and Taiwan and finds no long run relationship between public spending and output.

Absence of long run relationship between public expenditure and per capita GDP does not mean that variables are also not linked in the short run. In simpler words, there remains the possibility that variables are causing or caused by each other. The non co-integration between the variables restricts us from using ECM\textsuperscript{34} to know the short run dynamics of the variables. When the variables are not co-integrated the Granger causality test can determine the nature of causality between the variables in the short run. Therefore, we perform Granger causality test according to the procedure discussed in section 4.4. Causality test results are summarized in table 4.3.

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>P-Value</th>
<th>Decision</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Expenditure does not Granger cause Per Capita GDP</td>
<td>0.309</td>
<td>Do not Reject</td>
<td>No Causality Exists, \textit{KH} Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Public Expenditure</td>
<td>0.032</td>
<td>Reject</td>
<td>Causality Exists, \textit{WH} Holds</td>
</tr>
<tr>
<td>Defense Expenditure does not Granger cause Per Capita GDP</td>
<td>0.547</td>
<td>Do not Reject</td>
<td>No Causality Exists, \textit{KH} Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Defense Expenditure</td>
<td>0.208</td>
<td>Do not Reject</td>
<td>No Causality Exists, \textit{WH} Does Not Hold</td>
</tr>
<tr>
<td>Public Education Expenditure does not Granger cause Per Capita GDP</td>
<td>0.062</td>
<td>Reject</td>
<td>Causality Exists, \textit{KH} Holds</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Public Education Expenditure</td>
<td>0.504</td>
<td>Do not Reject</td>
<td>No Causality Exists, \textit{WH} Does Not Hold</td>
</tr>
<tr>
<td>Public Health Expenditure does not Granger cause Per Capita GDP</td>
<td>0.529</td>
<td>Do not Reject</td>
<td>No Causality Exists, \textit{KH} Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not granger cause Public Health Expenditure</td>
<td>0.409</td>
<td>Do not Reject</td>
<td>No Causality Exists, \textit{WH} Does Not Hold</td>
</tr>
</tbody>
</table>

\textit{Note:} \textit{KH} and \textit{WH} stand for Keynes’ Hypothesis and Wagner’s Hypothesis respectively.

\textsuperscript{34} Error Correction Model is applicable when variables are co-integrated.
The results reported in table 4.3 show that variables are not influencing each other in the short run with two exceptions. Firstly, public expenditure in Pakistan is caused by economic activity in the short run. It means when the economic activity expands government spends more as it can increase its tax revenue. This result validates that in short run public expenditure follows Wagner’s hypothesis in Pakistan. Secondly, public education expenditure is causing per capita GDP in the short run. Therefore, it is concluded that in short run, public education expenditure follows Keynes hypothesis in Pakistan. In all other cases neither Wagner’s law nor Keynes hypothesis is supported.

Our findings are supported by previous studies aimed to resolve the issue of direction of flow between public expenditure and economic activity. For example, earlier studies of Khan (1990) and Rehman, Ahmed & Awan (2007), reach the conclusion that per capita income among others is the major determinant of growth of public expenditure in Pakistan. Likewise, Ansari, Gordon and Akuamoah (1997) find positive support in favor of Wagner’s law when they test the law for South Africa, Ghana and Kenya. Our finding that public education expenditure causes per capita GDP is supported by Iqbal and Zahid (1998) who state that education is a prerequisite to enhance growth and is the foundation stone in Pakistan upon which economic development can be erected.

4.5.2- India:

Table 4.2 shows that all the residual series in case of India are non-stationary. This implies that variables are not co-integrated. In simpler words, per capita GDP, public expenditure and its sub components are not moving together in the long run. Similar findings
are reported by Halicioglu (2003) who reports non existence of any long run relationship between government spending and economic activity in Turkey. These finding are similar to that of Pakistan. Possibility exists for short run linkage between the variables despite that they are not co-integrated. Therefore, Granger causality test is applied to know the short run behavior of the variables. The results are summarized in table 4.4.

**Table 4.4**

Summary of Granger Causality Test Results (India)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>P-Value</th>
<th>Decision</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Expenditure does not Granger cause Per Capita GDP</td>
<td>0.37</td>
<td>Do not Reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Public Expenditure</td>
<td>0.97</td>
<td>Do not Reject</td>
<td>No Causality Exists, WH Does Not Hold</td>
</tr>
<tr>
<td>Defense Expenditure does not Granger cause Per Capita GDP</td>
<td>0.56</td>
<td>Do not Reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Defense Expenditure</td>
<td>0.16</td>
<td>Do not Reject</td>
<td>No Causality Exists, WH Does Not Hold</td>
</tr>
<tr>
<td>Public Education Expenditure does not Granger cause Per Capita GDP</td>
<td>0.31</td>
<td>Do not Reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Public Education Expenditure</td>
<td>0.03</td>
<td>Reject</td>
<td>Causality Exists, WH Holds</td>
</tr>
<tr>
<td>Public Health Expenditure does not Granger cause Per Capita GDP</td>
<td>0.59</td>
<td>Do not Reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not granger cause Public Health Expenditure</td>
<td>0.16</td>
<td>Do not Reject</td>
<td>No Causality Exists, WH Does Not Hold</td>
</tr>
</tbody>
</table>

*Note: KH and WH stand for Keynes’ Hypothesis and Wagner’s Hypothesis respectively.*

The summery of Granger causality test results, table 4.4, shows that null hypothesis of no causality between variables cannot be rejected in common, however, can be rejected only in case of public education expenditure. The causality pattern between public education expenditure and per capita GDP is Wagnerian which means that public education expenditure is caused by per capita GDP in the short run. The results are almost similar to that of Pakistan. The only difference is that in Pakistan public education expenditure is linked with per capita GDP in
the short run in Keynesian sense while in India public education expenditure follows Wagner’s law.

4.5.3- Sri Lanka:

The results presented in table 4.2, in case of Sri Lanka, are different from Pakistan and India. It is clear that the residual series obtained from regressing per capita GDP on public expenditure is stationary at 10% level of significance. This shows that public expenditure and per capita GDP are co-integrated. Put differently public expenditure and per capita GDP are moving together in Sri Lanka.

To know whether public expenditure follows Wagner’s law or Keynes hypothesis, it is necessary to know the direction of causality. As the variables are co-integrated this allows for the use of ECM as it determines causality indirectly. Therefore, ECM is conducted according to the procedure discussed in section 4.4. The ECM results are shown in table 4.5. Table 4.5 shows that results are according to the prior expectation. The error correction term $EC_{t-1}$ has the expected negative sign. The estimated coefficient of the lagged error correction term shows that error correction is happening in the model. The feedback coefficient is -0.70 which suggests that approximately 70% disequilibrium in the previous year is corrected in the current year.
Table 4.5
Error Correction Analysis (Sri Lanka)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ECM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td>ΔGₜ</td>
<td>ΔYₜ</td>
</tr>
<tr>
<td>Independent</td>
<td>Coefficient</td>
<td>[t-statistic]</td>
</tr>
<tr>
<td>C</td>
<td>0.002760</td>
<td>[0.065930]</td>
</tr>
<tr>
<td>ECₜ₋₁</td>
<td>-0.699794</td>
<td>[-3.994322]</td>
</tr>
<tr>
<td>ΔEXₜ₋₁</td>
<td>0.240358</td>
<td>[1.581049]</td>
</tr>
<tr>
<td>ΔEXₜ₋₂</td>
<td>0.098186</td>
<td>[0.558827]</td>
</tr>
<tr>
<td>ΔPCGₜ₋₁</td>
<td>0.980498</td>
<td>[1.346342]</td>
</tr>
<tr>
<td>ΔPCGₜ₋₂</td>
<td>-0.583696</td>
<td>[-0.893229]</td>
</tr>
</tbody>
</table>

Note: Gₜ & Yₜ are public expenditure and per Capita GDP respectively.

The error correction term is significant only in one equation of the error correction model. This implies that both variables are not causing each other and this causality is unidirectional. The error correction term is significant when public expenditure is the dependent variables. This implies that the causality runs from per capita GDP to public expenditure, suggesting that public expenditure in Sri Lanka follows Wagner’s law. For non co-integrated variables Granger causality test is performed as usual and results are given in table 4.6.
Table 4.6
Summary of Granger Causality Test Results (Sri Lanka)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>P-Value</th>
<th>Decision</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defense Expenditure does not Granger cause Per Capita GDP</td>
<td>0.75</td>
<td>Do not Reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Defense Expenditure</td>
<td>0.72</td>
<td>Do not Reject</td>
<td>No Causality Exists, WH Does Not Hold</td>
</tr>
<tr>
<td>Public Education Expenditure does not Granger cause Per Capita GDP</td>
<td>0.67</td>
<td>Do not Reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Public Education Expenditure</td>
<td>0.84</td>
<td>Do not Reject</td>
<td>No Causality Exists, WH does not Hold</td>
</tr>
<tr>
<td>Public Health Expenditure does not Granger cause Per Capita GDP</td>
<td>0.92</td>
<td>Do not Reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not granger cause Public Health Expenditure</td>
<td>0.23</td>
<td>Do not Reject</td>
<td>No Causality Exists, WH Does Not Hold</td>
</tr>
</tbody>
</table>

Note: KH and WH stand for Keynes’ Hypothesis and Wagner’s Hypothesis respectively.

The summery statistics presented in table 4.6 state that different components of public expenditure are not linked with per capita GDP in short run. Succinctly speaking, defense expenditure, public education expenditure and public health expenditure neither cause nor caused by per capita GDP in Sri Lanka. Therefore, it can be concluded that though at aggregated level of public expenditure Wagner’s hypothesis holds yet no evidence can be found in favor of Wagner’s or Keynes hypothesis at disaggregated level of public expenditure. These findings are supported by some empirical studies. For example, Alfaris’s study (2002) investigates causal relationship between public expenditure and national income for the Gulf Cooperation countries and finds strong evidence for Wagner’s Hypothesis and no evidence for Keynes law. Likewise Ghali (1997), in a time series study on Saudi Arabia, tests for the causality pattern between public expenditure and economic growth and finds that in Saudi Arabia economic activity causes growth in public expenditure.
4.5.4- Nepal:

Table 4.2 shows that the null hypothesis of non stationarity of the residual cannot be rejected, in case of Nepal, except public education expenditure. It implies that only public education expenditure and per capita GDP are co-integrated while public expenditure, defense expenditure and public health expenditure possess no long run relationship with per capita GDP in Nepal. Following the strategy applied in case of Sri Lanka, the ECM and Granger causality test are applied in case of co-integrated and non co-integrated variables respectively to know their short run dynamics. The ECM is applied and results are reported in table 4.7.

<table>
<thead>
<tr>
<th>Variables</th>
<th>ECM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td>( \Delta EDU_t )</td>
</tr>
<tr>
<td>Independent</td>
<td>Coefficient</td>
</tr>
<tr>
<td>C</td>
<td>0.007340</td>
</tr>
<tr>
<td>( EC_{t-1} )</td>
<td>-0.220793</td>
</tr>
<tr>
<td>( \Delta EDU_{t-1} )</td>
<td>0.458440</td>
</tr>
<tr>
<td>( \Delta EDU_{t-2} )</td>
<td>-0.214883</td>
</tr>
<tr>
<td>( \Delta PCG_{t-1} )</td>
<td>1.706350</td>
</tr>
<tr>
<td>( \Delta PCG_{t-2} )</td>
<td>-0.388132</td>
</tr>
</tbody>
</table>

**Note:** \( EDU_t \) & \( Y_t \) denote public education expenditure and per capita GDP respectively.

The ECM results reported in table 4.7 show that the error correction term has the negative sign. It means that error correction is happening in the model. The feedback
coefficient is -0.22. It implies that 22% disequilibrium in the previous year is corrected in the current year. The error correction term is only significant in equation where GDP is the dependent variable. Therefore, it is concluded that public education expenditure cause per capita GDP in Nepal. This suggests that public education expenditure follows Keynes hypothesis in Nepal. Needless to say, for non co-integrated variables Granger causality test is used to know whether variables are causing each other in the short run or not. The results of the test are reported in table 4.8.

Table 4.8
Summary of Granger Causality Test Results (Nepal)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>P-Value</th>
<th>Decision</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Expenditure does not Granger cause Per Capita GDP</td>
<td>0.02</td>
<td>Reject</td>
<td>Causality Exists, KH Holds</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Public Expenditure</td>
<td>0.16</td>
<td>Do not reject</td>
<td>No Causality Exists, WH does not Hold</td>
</tr>
<tr>
<td>Defense Expenditure does not Granger cause Per Capita GDP</td>
<td>0.78</td>
<td>Do not reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Defense Expenditure</td>
<td>0.41</td>
<td>Do not reject</td>
<td>No Causality Exists, WH Does Not Hold</td>
</tr>
<tr>
<td>Public Health Expenditure does not Granger cause Per Capita GDP</td>
<td>0.58</td>
<td>Do not reject</td>
<td>No Causality Exists, KH Does Not Hold</td>
</tr>
<tr>
<td>Per Capita GDP does not Granger cause Public Health Expenditure</td>
<td>0.04</td>
<td>Reject</td>
<td>Causality Exists, WH Holds</td>
</tr>
</tbody>
</table>

Note: KH and WH stand for Keynes’ Hypothesis and Wagner’s Hypothesis respectively.

The results reported in table 4.8 reveal that null hypothesis of no causality can be rejected in case of public expenditure and public health expenditure. It implies that, in the short run, causality runs from public expenditure to per capita GDP supporting the validity of Keynes hypothesis. Similarly public health expenditure is caused by per capita GDP. Therefore, it is concluded that public health expenditure follows Wagner’s law in case of Nepal in the short run. This finding is justifiable on the ground that when per capita income of a country increases,
government spends more on the social sector including health of the community, a proposition put forward by Wagner.

The results obtained in this chapter provide deep insight into the long run as well as short run relationship between public expenditure, its sub-components and economic development in selected South Asian economies over the last 36 years. It is interesting to note that despite many similarities in the sample\textsuperscript{35}, results vary across countries to some extent. A few variables are linked in Keynesian sense while a number of other variables show the relationship that is supported by Wagner proposition. The difference of results is due to the difference in policies adopted in different time periods across countries\textsuperscript{36}, political considerations, ideological commitments, economic models, level of development, degree of openness, nature and structure of expenditure and tax systems, institutional arrangements for public decision making (Heller, 2002; Ljungman, 2008), independency and capacity of central banks and geo-political importance of the respective country.\textsuperscript{37}

The broad conclusion emerges from the analysis is that neither public expenditure, as a whole, has played an efficient role in enhancing the economic development of the region nor increase in the size of public sector can be explained in terms of growth in economic activity. This finding is supported by Lorie (2006) who concludes that “it is a widespread perception that

\textsuperscript{35} According to Osmani (2009), “the time pattern of uneven growth has been strikingly similar for all countries of the South Asia”.

\textsuperscript{36} See appendix II.

\textsuperscript{37} As an example, terrorist incidences occur in Pakistan on frequent basis along with ethnic conflicts especially between Shias and Sunnis; in Sri Lanka, though long conflict with Tamil Tigers is over yet the country has to institutionalize a peace process to attain permanent stability. Recently, democracy has taken its roots in Nepal after a strong struggle yet the political situation cannot be declared excellent. Ethnic, caste and religious conflicts occur in India with regular intervals despite its stable political system. According to an estimate, more than one fifth of India is affected, directly or indirectly, by this insurgency.
government expenditure is not particularly efficient in delivering positive “outcomes” in a
developing country like Pakistan. For instance, red-tape and even corruption is seen as reducing
the effectiveness of any given amount of rupees spent on general administration”.

Several reasons may be enlisted for the independent behavior of public expenditure and
per capita GDP in the region. The politicization of the public resources attracts more attention
than others. It is believed that public resources are more politicized and remain less productive
in developing countries than developed countries (Ichimura, 1989) as estimated threshold level
of public expenditure is higher in developed economies.\(^{38}\) The meager share of developmental
expenditure in total expenditure can also help explain the independent behavior of growth and
public expenditure in the last four decades. Debt servicing and defense expenditure consumes
lion’s share of the total revenue and do not contribute much to the economic development of
the country. Instead factors other than public expenditure can well explain the growth in these
economies. For example, more liberal trade policy, direct (public ownership) or indirect (set of
administrative controls) intervention of states and policies towards agriculture can help explain
different phases of growth in south Asia (Osmani, 2009).\(^{39}\)

The conclusion that public expenditure growth is not an outcome of growth in economic
activity in Pakistan, India and Nepal show that some other, economic as well as non economic,
factors have led to the growth in public expenditure in these economies.\(^{40}\) This forces to look at
other possible determinants of public sector size. The possibility exists that rise in public
spending may be response to demand influences. It is agreed that rising demand for public

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\(^{38}\) Pevcin (2004) estimated that the average threshold level of public expenditure in eight advanced economies is
42% of GDP that is much higher when compared with developing countries.

\(^{39}\) See also appendix II.

\(^{40}\) The basis of decision-making is not economic factors alone and the influence of non-economic factors has been
found more important in almost all developing countries as against the developed countries (Ichimura, 1989).
services can be the propelling force in determining the level of public expenditure particularly in low income countries (Bird and Zolt, 2003) rather than the availability of revenues determining spending in developing countries where the social infrastructure is below the optimal level. In addition, political process and different developmental models across countries may be cited as possible explanatory factors for the increase in the size of government expenditure. At the outset it should be remembered that these factors even are unlikely to yield for the observed differences between countries regarding the size of public sector. Furthermore, the differences in the ideological stance of the leadership of the country cannot be ignored (Martin and Lewis, 1956: Chletsos and Kollias, 1997).

The independency of the defense expenditure and per capita GDP is also a matter of concern as it shows that other factors like political instability, internal and external disputes and ethnic issues determine the level of defense expenditure in this region. The political solutions of internal and external disputes can release the pressure of defense expenditure that in turn can leave much room for developmental expenditure that further has positive effect on economic growth.

Contrary to above mentioned general conclusion, a number of individual results deserve explanation. The linkage between public expenditure and per capita GDP in Sri Lanka in Wagnerian sense shows that in Sri Lanka higher level of public expenditure has been maintained on the expense of higher tax revenues. It is evident that growth in economic activity and then increase in total revenue supported the higher level of public expenditure in

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41 Figure 3.4, chapter 3, clearly brings out that taxes measured as a percent of GDP remain significantly higher in Sri Lanka than the other economies in the region.
Sri Lanka. This may be attributed to the better performance of the private sector in addition to well documentation of the economy in Sri Lanka. Furthermore consistent aid has permitted higher level of public expenditure than would have otherwise possible (Rahman, 2005).

Why public expenditure and economic development are co-integrated in Sri Lanka and not co-integrated in other three economies of the region deserve attention. It is because of the unique nature of Sri Lanka in the region in many aspects. For example “it had markedly superior record in respect of quality of life, measured by such criteria as literacy, infant mortality, life expectancy, etc. Secondly, Sri Lanka also had a significantly higher per capita income. Owing largely to different initial conditions, Sri Lanka’s development strategy also diverged significantly from the rest of the region, at least during the immediate post-Independence era. The major reason behind this may be the concept of continuing a tradition that had first emerged in the colonial era, the government adopted an explicitly welfarist strategy whereby the entire population was provided with free food ration, free primary healthcare and free education up to the tertiary level, funded primarily by the earnings of the plantation sector” (Osmani, 2009).

The conclusion that public education expenditure causes per capita GDP in Nepal is much interesting as such evidence is absent in other countries included in the research. It is justifiable on the ground that Nepalese authorities managed to spend bulk of their scarce resources, in relative term, on continuous basis to education requirements of their people despite their lowest tax to GDP ratio in the region. Contrary to other neighboring economies, on average, public education expenditure show an upward trend in Nepal on continuous basis.

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42 Public expenditure measured as a share of GDP remained higher in Sri Lanka than its neighboring economies (see figure 3.1 chapter 3).
Currently, the share of public education expenditure measured as a share of GDP is much higher in Nepal than Pakistan and India.\textsuperscript{43} This high level of development expenditure has been possible due to higher inflow of foreign aid (Narayan, 2011). This has paid dividends in terms of sustainability of the private sector and gradual increase in the growth rate of the economy.

In the short run the results also show small variations across countries but carry small weight as the short run differences in results do not overwhelmingly dormant the nature and importance of results obtained in the long run. Generally, it can be inferred that the evidence of causality between different components of public expenditure and per capita GDP is the result of better performance of the public sector in different regimes in different countries. The short run linkage between education expenditure and per capita GDP in Keynesian sense in Pakistan can be attributed to the decade of eighties in which developmental expenditure show significant increase along with sustainable growth. Likewise the Wagnerian sense relationship between public expenditure and economic activity in Pakistan, in the short run, can be the outcome of flourishing private sector in the Musharruf led military rule that increased the revenue earnings and supported the increasing public sector. Similarly, the Wagnerian association between education expenditure and economic activity in India could be result of the liberalization of Indian economy in 1990’s\textsuperscript{44} that speeded up the economic growth and led to substantial increase in public revenue.\textsuperscript{45} Resultantly, authorities were able to address education phenomenon in a more appropriate way by finding more fiscal space compare to

\textsuperscript{43} See figure 3.9 chapter 3.  
\textsuperscript{44} See appendix II.  
\textsuperscript{45} Fiscal consolidation efforts, which were undertaken in the early 1990’s, enabled a sharp fiscal correction in terms of increase in public revenues. This has been achieved due to the enactment of the fiscal responsibility and Budget Management (FRBM) Act, 2003 (Pattnaik et al, 2005).
previous periods. Similar reasons support the short run Wagnerian sense relationship between health expenditure and per capita GDP in Nepal.\textsuperscript{47} In different regimes, despite low tax revenue base, health expenditure was prioritized and shows an encouraging picture of the social sector.\textsuperscript{48}

This discovery of statistical results may provide insight into several aspects of policy implications. First and foremost, the Keynesian proposition of government expenditure as a policy instrument to encourage and lead growth in the economy is not supported by the data for four South Asian countries included in the research. Likewise, different components of public expenditure cannot be used as instruments of stabilizing policy. This seems inconsistent with the traditional theory of fiscal policy. Second, taking a micro viewpoint of each item of total public expenditure, defense spending is proven to have no influence on per capita GDP growth. Possible explanation could be that a huge amount of money on defense is used in the unproductive uses rather than on the buying of modern technology.

Policy recommendations that could be reasonably inferred from the results include; expenditure on health and education should be more prioritized than all the other items of spending assuming economic growth is the utmost goal for the South Asian countries and can be achieved only by spending more on human resource development as is obvious from the example of many other developing countries of the world. On the other hand defense expenditure need to be reallocated to human resource expenditure as defense expenditure is proven to be of little help to growth. Good governance can reverse the situation and can help in

\textsuperscript{46} Figure 3.9, chapter 3 shows that public education expenditure in India is on continuous rise since mid 190’s.  
\textsuperscript{47} Over the past several year Nepal has found a large fiscal space due to its significantly improving debt position (IMF country report no. 10/184).  
\textsuperscript{48} Health expenditure is showing significant increase in Nepal since 1990 (see figure 3.10 in Chapter 3).
improving the efficiency of public sector. This requires determination and will on the part of policy makers. If done and implemented with concrete objectives, it may have positive effect on the economic performance of the economy.

4.6- Concluding Remarks:

This chapter investigates whether public expenditure and its sub categories possess any long run/ short run relation with per capita GDP in selected South Asian countries- Pakistan, India, Sri Lanka and Nepal. To achieve this, Engel Granger (1987) co-integration and Granger causality test are applied. Despite having many similarities in the sample, the results vary to some extent.

The general conclusion that emerges from analysis is that government expenditure and per capita GDP are not co-integrated in the selected South Asian countries except Sri Lanka. It means that growth in public expenditure is not an outcome of growth in economic activity and is determined by some other factors. Indirectly, it is deduced that public revenues do not increase with the expansion in economic activities. Similarly, government policies have been unable to affect economic development in these countries. However, in Sri Lanka the growth in public expenditure can be attributed to the growth in per capita GDP. In Nepal, public education expenditure has contributed to its economic development contrary to its neighboring countries. It has been achieved on the basis of government’s strong commitment to spend bulk of resources on the education sector despite small tax to GDP ratio. A noteworthy aspects of our findings is that defense expenditure neither causes nor caused by
economic activity in all the countries. This suggests that in this region defense expenditure is independent of the stages of development and depends on some non economic factors.
CHAPTER 5

IMPACT OF PUBLIC EXPENDITURE ON ECONOMIC GROWTH:
DOES THE SOURCE OF FINANCE MATTER?

The analysis carried out in chapter 4 reveals that public expenditure, its sub components and per capita GDP are not co-integrated in the selected South Asian economies. However, this analysis does not provide any information on the positive or negative effect of public expenditure on per capita GDP. Furthermore, the relative importance of financing source of public expenditure in determining its impact on growth is not evident. This chapter will examine the effects of public expenditure, its sub categories on economic growth when financed through different sources. This chapter proceeds as follows. Section 5.1 gives a brief introduction of the issue. Section 5.2 briefs data and variables. Section 5.3 sheds light on the model and econometric methodology used to achieve the objective. In section 5.4 estimation procedure and results are discussed. Section 5.5 concludes the chapter.

5.1- Introduction:

The nexus between government spending and economic growth has been a subject of great interest for economists over the years. A substantial volume of theoretical as well as empirical research has placed its attention in identifying the factors, particularly public expenditure, that are significantly associated with economic growth. The results are mixed and inconclusive both for time series and panel sets of data. In a broader sense this literature can be divided into two strands.
One strand of literature searches for the determinants of economic growth and does not account for the role of budget constraint (Knoop, 1999; Ghura, 1995; Gupta and Verhoeven, 2001). Such omission may be misleading and has less valuable insight for policymakers. In contrast, a very brief strand of literature highlights the role of different sources of financing government expenditure in terms of economic growth (Barro, 1990; Palivos and Yip, 1995; Espinosa-Vega and Yip, 1999). However, the most prominent work on this issue relates to Miller and Russek (1997) who provide a detailed discussion over the relative importance of tax financed and debt financed increases in public spending in terms of economic growth and report that the results vary considerably as the source of finance differs across countries.49 This study suffers a limitation that it makes the effect of debt financed expenditure ambiguous by not distinguishing between the individual effects of seigniorage and bond financed increases in government expenditure. Bose, Holman and Neanidis (2005) target this limitation and search for the role of seigniorage and provide valuable contribution to the existing literature.50

Though this strand of literature acknowledges the role of budget constraint in determining the effects of public spending on economic growth yet it does not consider three major sources of public finance simultaneously. The results may vary when all the three sources (tax, debt, and seigniorage) are taken into account simultaneously. In this context, it is believed that the knowledge regarding the relative importance of different sources of finance will be

49 Miller and Russek (1997) report that in developing countries tax financed increases in public expenditure lead to higher growth while debt financed increases retard economic growth. For developed countries, debt financed increases in public expenditure does not affect growth while tax financed increases lead to lower growth.
50 Bose, Holman and Neanidis (2005) suggest that in high income countries tax financed government expenditure retard economic growth than if it were financed through seigniorage while for low income countries increases in government expenditure financed with seigniorage retard growth more as compared to if it were financed through taxes.
critically important for the decision makers. Especially, the relative importance of source of finance increases many folds in respect of South Asian countries where governments have been facing high fiscal deficits on continuous basis.

5.2- Data and Variables:

The analysis of this chapter comprises both time series as well as panel estimation for four South Asian countries—Pakistan, India, Sri Lanka and Nepal—over the period 1975-2008. Variables used in this chapter come from three sources i.e., World Development Indicator (WDI), Government Finance Statistics (GFS) and International Finance Statistics (IFS). Variables are categorized into two groups, fiscal and non fiscal. Fiscal variables, in which we are interested more, comprise public expenditure, public revenues, public surplus/deficit and government expenditure on defense, education and health. Trade openness, investment and population growth are the non fiscal/conditional variables. All variables are measured as a share of GDP except growth in per capita GDP and population growth. Over all 136 observations are available for the panel analysis. Some of the variables are discussed in detailed as follows.

5.2.1- Government Borrowing:

To finance its deficit government has to borrow. Contrary to other fiscal variables, to have the direct measure of government borrowing is often a difficult task in empirical

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51 In general time series results remain insignificant which forced us to use a panel data for the analysis. The time series results are available in appendix VII.
52 IFS are published by International Monetary Fund.
53 Gross fixed capital formation as a share of GDP is used as a proxy for investment.
54 In empirical literature especially regarding developing countries it has become a norm to include openness, population growth and investment as a conditional variable in the regression analysis.
55 Variables with their source are shown in appendix III.
literature.\textsuperscript{56} Rodriguez (1994) used the difference between deficit and revenues from printing of money as a proxy for the part of total public spending which is financed through issuing of interest bearing bonds. We also follow this approach to measure the government borrowing.

5.2.2- Seigniorage:

Like government borrowing, the measurement of seigniorage has also been a widely discussed issue in empirical literature. To measure its magnitude different alternative estimates have been suggested.\textsuperscript{57} We follow the methodology adopted by Fischer (1982) to measure seigniorage.\textsuperscript{58}

5.2.3- Deficit:

From total expenditure and total revenues series we construct a variable deficit by subtracting total government expenditure from total government revenues.

5.2.4- Other Expenditure:

Other expenditure series is constructed by subtracting the sum of defense, education and health expenditure from total public expenditure.

5.2.5- Trade Openness:

Trade openness is the sum of exports and imports of goods and services measured as a share of gross domestic product.

\textsuperscript{56} Bose, Holman and Neanidis (2005).
\textsuperscript{57} See Drazen (1985), klein & Neumann (1990) and Honohan (1996).
\textsuperscript{58} We will use some other measures of seigniorage to check robustness of our results. The different practices to measure seigniorage are available in appendix V.
5.2.6- Reserve Money:

The monetary base, high-powered money, comprises central bank liabilities that support the expansion of broad money and credit.

5.3- The Model & Econometric Methodology:

We start our model by defining the growth rate of per capita GDP as under:\(^{59}\)

\[ g_{it} = \ln y_{it} - \ln y_{it-1} \]

Where \( g_{it} \) is growth in per capita GDP in country \( i \) at time \( t \). \( y \) is the Gross Domestic Product per capita, \( \ln \) is the natural logarithm operator. Let \( X_{it} \) be the vector of non fiscal/conditional variables that generally appear in growth regressions\(^{60}\) and \( W_{jt} \) be the budget constraint\(^{61}\), the model can be written as under;

\[ g_{it} = \beta + \sum_{i=1}^{n} \theta_i X_{it} + \sum_{j=1}^{m} \gamma_j W_{jt} + u_{it} \]

Where \( u_{it} \) is the error term. The error term \( u_{it} \) captures, as usual, the impact of omitted variables. The critical assumption about error term in classical regression model is that it is independent and identically distributed. In pooled cross-section time series analysis these omitted variables can be further categories into three groups. Hence, the error term can be written as;

\[ u_{it} = \alpha C_i + \delta T_i + \pi_{it} \]

\(^{59}\) We borrow some work from Miller and Russek (1997), Helms (1985), Bose, Holman and Neanidis (2005).

\(^{60}\) Conditional variables include population growth, investment and trade openness.

\(^{61}\) Budget constraint is discussed shortly.
Where $C_i$ denotes the variation in cross country variables such as climate and geography\textsuperscript{62} and $\alpha$ measures the effect of these variables. $T_t$ shows the time variant but country invariant variables such as world economic condition, technological changes, external effects such as war and $\delta$ captures the influence of these factors. $\pi$ is the measure of both country and time variant variables. Now by substituting equation (5.3) into equation (5.2) the model takes the following form:

$$g_{it} = \beta + \sum_{i=1}^{n} \theta_i X_{it} + \sum_{j=1}^{m} \gamma_j W_{jt} + \alpha C_i + \delta T_t + \pi_{it} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (5.4)$$

The estimation of above equation by ordinary least square method will yield misleading results if the country specific and time specific effects are ignored.\textsuperscript{63} To avoid this bias we apply Fixed Effect Model (FEM).\textsuperscript{64} An alternative to FEM is Random Effect Model (REM) but our choice is biased towards FEM.\textsuperscript{65}

5.3.1- Government Budget Constraint:

Government can generate revenues to finance its expenditure in three major ways. Firstly, it can tax. Secondly, it can print money. Thirdly, it can borrow. We can write government budget constraint as an identity:

$$EXP N_{jt} = NTR_{jt} + TR_{jt} + D_{jt} + S_{jt} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (5.5)$$

\textsuperscript{62} These variables are time invariant.
\textsuperscript{63} See Hsiao (1986).
\textsuperscript{64} FEM is also called Least Square Dummy Variable (LSDV).
\textsuperscript{65} “If T (the number of time series) is large and N (the cross sectional unit) is small, there is likely to be little difference in the values of the parameters estimated by FEM& REM. Hence the choice here is based on computational convenience. On this score FEM is preferable” (Gujrati, 1995).
Where $EXPN$ is the total government expenditure including interest payments on debt. $NTR$ is non tax revenue, $TR$ is tax revenue, $S$ is the seigniorage used to finance budget deficit and $D$ is the debt financing or rest of the budget financing. The left hand side of the above identity shows total expenditure while right hand side is the total revenues from different sources.

Inclusion of all the above components of budget constraint into regression (5.4) will give rise to the problem of perfect collinearity as budget constraint is an identity. So, to avoid this (at least) one of the components of budget constraint must be omitted from the regression equation. The excluded element becomes an implicit source of financing of that expenditure as it can change freely. For example if we omit $D_t$ and include all other elements in our specification of equation (5.6) then coefficient attached with public expenditure captures the impact of debt financed increases in public spending on economic growth as the other sources of finance do not change. Likewise other financing source i.e., tax and debt can be excluded in turn. This taxonomy has been adopted by Ahmed and Miller (2000), Miller and Russek (1997) and Bose, Holman and Neanidis (2005).

5.3.2- Regression specifications:

Our regression analysis comprises two sets of equations. In the first category aggregated public expenditure is considered while in the second category public expenditure is disaggregated into its different sub components. Each equation in both categories includes a set of conditional variables that have been discussed previously.

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66 New issues of interest bearing debt make a major part of rest of budget financing (Bose, Holman and Neanidis 2005).
67 Non tax revenue is not a choice variable. So we exclude debt, tax and seigniorage in turn to see the impact of public expenditure on economic growth when financed through different sources.
5.3.2.1- Debt Financed Public Expenditure:

According to taxonomy discussed previously we omit debt component of budget constraint and keep other sources of financing in this specification.

\[ g_{it} = \beta + \sum_{i=1}^{n} \theta_i X_{it} + \gamma_1 EXPN_{jt} + \gamma_2 NTR_{jt} + \gamma_3 TR_{jt} + \gamma_4 S_{jt} + u_{it} \] \hspace{1cm} (5.6)

In this specification debt is excluded and hence it becomes the implicit source of finance. \( \gamma_1 \) is supposed to measure the effect of debt financed increases in public spending on growth. When we disaggregate total public expenditure into its sub components the above specification can be modified as under:

\[ g_{it} = \beta + \sum_{i=1}^{n} \theta_i X_{it} + \gamma_1 DEF_{jt} + \gamma_2 EDU_{jt} + \gamma_3 HTH_{jt} + \gamma_4 OTH_{jt} + \gamma_5 NTR_{jt} + \gamma_6 TR_{jt} + \gamma_7 S_{jt} + u_{it} \] \hspace{1cm} (5.7)

Where \( DEF, EDU, HTH \) and \( OTH \) are defense expenditure, public education expenditure, public health expenditure and a residual other expenditure respectively. \( \gamma_1, \gamma_2 \& \gamma_3 \) measure the effects of defense, education and health expenditure respectively on economic growth when financed through debt.

5.3.2.2- Money Financed Public Expenditure:

Excluding revenues generated from printing of money makes it the implicit source of finance and the specification can be written as:
\[ g_{it} = \beta + \sum_{i=1}^{n} \theta_i X_{it} + \gamma_1 EXPN_{jt} + \gamma_2 NTR_{jt} + \gamma_3 TR_{jt} + \gamma_4 D_{jt} + u_{it} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ ld
\[ g_{it} = \beta + \sum_{i=1}^{n} \theta_i X_{it} + \gamma_1 DEF_{jt} + \gamma_2 EDU_{jt} + \gamma_3 HTH_{jt} + \gamma_4 OTH_{jt} + \gamma_5 NTR_{jt} + \gamma_6 S_{jt}^t + \gamma_7 D_{jt} + u_{it} \] 

\[(5.11)\]

Where \( \gamma_1, \gamma_2 \& \gamma_3 \) are supposed to measure the effects of defense expenditure, public education and health expenditure respectively on growth when financed through taxes.

### 5.4- Estimation and Results:

All specifications mentioned above are estimated by ordinary least square method (OLS) as well as Fixed Effect Method (FEM). To judge which method is more appropriate, F test is used that compares OLS with FEM.\(^68\) The calculated F value\(^69\) is highly significant mentioning the supremacy of FEM on restricted regression i.e., OLS. Therefore, we report the results obtained from Fixed Effect Model.\(^70\) Before starting estimation we present descriptive statistics to have a look at the behavior of the respective variables. Table 5.1 shows the summary of descriptive statistics.

It is evident from table 5.1 that per capita GDP growth varies slightly revealing the similar pattern of economic development over the years in South Asian countries. The value of standard deviation of per capita GDP growth is comparatively higher in Pakistan and India which shows that growth path of per capita GDP has been volatile in these countries over the years as compare to Sri Lanka and Nepal. The reason for this volatile growth path may be the

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\(^68\) Green (1990).

\(^69\) For computed F value see appendix VI.

\(^70\) OLS results are available in appendix IV.
heavy dependence of these countries on agriculture that further depends on weather conditions that have not been same over the years.

**Table 5.1**

Descriptive Statistics for Selected South Asian Countries

<table>
<thead>
<tr>
<th>Variables</th>
<th>PAKISTAN</th>
<th>INDIA</th>
<th>SRI LANKA</th>
<th>NEPAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>S.D</td>
<td>S.D</td>
<td>S.D</td>
<td>S.D</td>
<td>S.D</td>
</tr>
<tr>
<td>Min</td>
<td>Min</td>
<td>Min</td>
<td>Min</td>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
<td>Max</td>
<td>Max</td>
<td>Max</td>
<td>Max</td>
</tr>
<tr>
<td>P.C. growth*</td>
<td>2.66</td>
<td>3.68</td>
<td>3.17</td>
<td>1.81</td>
</tr>
<tr>
<td></td>
<td>1.98</td>
<td>2.88</td>
<td>2.06</td>
<td>2.54</td>
</tr>
<tr>
<td></td>
<td>-1.40</td>
<td>-4.0</td>
<td>-5.67</td>
<td>-5.20</td>
</tr>
<tr>
<td></td>
<td>7.00</td>
<td>7.70</td>
<td>5.57</td>
<td>7.20</td>
</tr>
<tr>
<td>Total Rev.</td>
<td>16.43</td>
<td>12.39</td>
<td>20.62</td>
<td>11.46</td>
</tr>
<tr>
<td></td>
<td>1.78</td>
<td>0.83</td>
<td>3.01</td>
<td>1.68</td>
</tr>
<tr>
<td></td>
<td>13.04</td>
<td>11.23</td>
<td>15.77</td>
<td>7.71</td>
</tr>
<tr>
<td></td>
<td>19.98</td>
<td>14.24</td>
<td>27.91</td>
<td>15.41</td>
</tr>
<tr>
<td>Tax Rev.</td>
<td>12.03</td>
<td>9.53</td>
<td>16.67</td>
<td>7.64</td>
</tr>
<tr>
<td></td>
<td>1.38</td>
<td>0.71</td>
<td>2.49</td>
<td>1.26</td>
</tr>
<tr>
<td></td>
<td>9.44</td>
<td>8.20</td>
<td>13.15</td>
<td>5.09</td>
</tr>
<tr>
<td></td>
<td>13.82</td>
<td>12.36</td>
<td>24.81</td>
<td>12.02</td>
</tr>
<tr>
<td>Total Exp.</td>
<td>22.71</td>
<td>15.71</td>
<td>29.41</td>
<td>15.79</td>
</tr>
<tr>
<td></td>
<td>3.05</td>
<td>1.55</td>
<td>4.96</td>
<td>2.22</td>
</tr>
<tr>
<td></td>
<td>16.05</td>
<td>11.86</td>
<td>23.20</td>
<td>9.14</td>
</tr>
<tr>
<td></td>
<td>27.14</td>
<td>19.48</td>
<td>42.42</td>
<td>20.21</td>
</tr>
<tr>
<td>Openness</td>
<td>33.89</td>
<td>21.89</td>
<td>73.63</td>
<td>40.64</td>
</tr>
<tr>
<td></td>
<td>2.98</td>
<td>10.22</td>
<td>8.21</td>
<td>11.79</td>
</tr>
<tr>
<td></td>
<td>27.72</td>
<td>43.61</td>
<td>59.04</td>
<td>22.27</td>
</tr>
<tr>
<td></td>
<td>38.91</td>
<td></td>
<td>88.64</td>
<td>64.03</td>
</tr>
<tr>
<td>Population**</td>
<td>2.59</td>
<td>1.90</td>
<td>1.19</td>
<td>2.26</td>
</tr>
<tr>
<td></td>
<td>0.27</td>
<td>0.33</td>
<td>0.40</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>2.10</td>
<td>1.30</td>
<td>1.90</td>
<td>1.70</td>
</tr>
<tr>
<td></td>
<td>3.20</td>
<td>2.30</td>
<td>1.90</td>
<td>2.50</td>
</tr>
<tr>
<td>Investment</td>
<td>17.09</td>
<td>22.62</td>
<td>23.64</td>
<td>18.81</td>
</tr>
<tr>
<td></td>
<td>1.63</td>
<td>4.77</td>
<td>4.00</td>
<td>2.43</td>
</tr>
<tr>
<td></td>
<td>13.90</td>
<td>16.10</td>
<td>13.80</td>
<td>13.40</td>
</tr>
<tr>
<td></td>
<td>21.30</td>
<td>34.60</td>
<td>31.30</td>
<td>22.50</td>
</tr>
</tbody>
</table>

*“P.C. growth” is per capita GDP growth. ** Population means annul percentage growth in population. Variables are expressed as a fraction of GDP except per capita GDP growth and population growth.
Trade variable has been more consistent in Pakistan and Sri Lanka as compare to India and Nepal. The average value of trade openness shows an encouraging trend in all the countries, however, the magnitude of trade is mainly an outcome of rising share of imports rather than exports. It is interesting that total revenues and tax revenues have been more consistent in Pakistan, India and Nepal. While in Sri Lanka both total revenues and tax revenues show volatility over the years. In context of total expenditure, it can be deduced that in Sri Lanka and Pakistan public expenditure has been volatile as compare to India and Nepal. The reason for this high volatility of government spending in Pakistan and Sri Lanka is the internal ethnic disputes that forced governments to spend more on military expenditure. In addition, high expenditure on debt servicing is also a reason of this higher level of government spending in Pakistan and Sri Lanka as compare to India and Nepal.

The difference between total revenues and total expenditure shows that all these economies have been facing deficits with varying degree in the last four decades. This trend may be attributed to the low tax to GDP ratio. The high expenditure on defense has also contributed to this persistent level of deficit in the region. Public expenditure on education and health show a gloomy picture in Pakistan and India while in other two economies human capital shows an encouraging scenario.

Population grew at an average annual percentage of 2.60 and 2.25 in Pakistan and Nepal respectively that is very high from every respect. It shows governments inability to check population growth in the last four decades in these two countries. In India and Sri Lanka, on the other hand, population has grown less than 2 percent per annum which shows that population...
growth is not a major concern for these two economies. Currently, Pakistan and Nepal need to check their population growth to avoid many socio economic problems that are deteriorating over time. The reason behind comparatively high population growth in the region is low literacy rate and high level of poverty among the mass.

Public investment provides infrastructure that is necessary condition for the development. The overall level of public investment in the region is satisfactory. However, the comparison within the countries shows that Sri Lanka and India have higher level of public investment as compare to Pakistan and Nepal. This shows less politicization of public resources in India and Sri Lanka. In addition, it is also a symbol of strong institutions in these two countries where decisions are not jeopardized as governments complete their terms that avoid the wastage of scarce resources.

From now estimation results are discussed. Our estimation is based on the taxonomy discussed in the section titled “regression specifications”. Results are reported in table 5.2. We start our discussion with the result for conditional variables. Openness variable conveys generally a consistent story over time. It remains highly significant with a positive sign in all our specifications. This means that trade openness has exerted positive impact on the economic growth of this region. This finding is consistent with the existing empirical literature. A significantly positive impact of openness variable on investment share of GDP has been reported by Levine and Renelt (1992). Ahmed and Miller (2000) also find a positive significant effect of a country’s openness on its investment. Our finding of the trade variable is also in line with the results of Bose, Holman and Neanidis (2005) that point out the positive effect of trade
variable on economic growth both for developed and developing countries although this effect is some time insignificant for developing countries.

**Table 5.2**

Results with Aggregated Public Expenditure Using Fixed Effect Model (FEM)
Per Capita GDP Growth is the Dependent Variable

<table>
<thead>
<tr>
<th></th>
<th>Tax Finance</th>
<th>Debt Finance</th>
<th>Money Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Expenditure</td>
<td>-0.329*</td>
<td>-0.397*</td>
<td>-0.510***</td>
</tr>
<tr>
<td></td>
<td>[-2.68]</td>
<td>[-3.33]</td>
<td>[-1.67]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.101**</td>
<td>0.103**</td>
<td>0.102**</td>
</tr>
<tr>
<td></td>
<td>[2.43]</td>
<td>[2.47]</td>
<td>[2.44]</td>
</tr>
<tr>
<td>Population</td>
<td>0.509</td>
<td>0.504</td>
<td>0.537</td>
</tr>
<tr>
<td></td>
<td>[0.45]</td>
<td>[0.48]</td>
<td>[0.48]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.149***</td>
<td>0.148***</td>
<td>0.150***</td>
</tr>
<tr>
<td></td>
<td>[1.75]</td>
<td>[1.76]</td>
<td>[1.77]</td>
</tr>
<tr>
<td>R-square</td>
<td>0.486</td>
<td>0.485</td>
<td>0.486</td>
</tr>
<tr>
<td>F-test</td>
<td>2.09</td>
<td>2.07</td>
<td>2.10</td>
</tr>
</tbody>
</table>

*, **, *** mean significantly different from zero (two tailed test) at the 1%, 5% and 10% level respectively. T. statistics are in parenthesis.

Population growth, contrary to general perception, has a positive impact on growth in this region. It reveals that labor force has contributed to the output of these economies over time. The reason for this result may be the highly dependence of these economies on agriculture sector that absorbs a large number of people and contributes significantly to output of the country. This finding is similar to that of Hakro (2009) who states that labor force is positively and significantly associated with economic performance of the developing South

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71 We use Fischer (1982) procedure to estimate magnitude of seigniorage in our base line regression.
Asian nations. This suggests that government should spend on education, training and skills as these facilities will enhance the productivity of the workers. However, this finding is contrary to Siddiqui and Malik (2001) who report that population growth has negative effect on economic development in South Asia.

The results reported in table 5.2 show that public investment has triggered growth in South Asia which highlights the role of infrastructure in stimulating economic growth in developing countries. This can be explained in terms of either underinvestment on the part of private sector or the greater marginal productivity of public sector resources. It suggests that scarce government expenditure should be directed to increase new human capital along with the maintenance of the existing stock of human capital. The findings are in conformity with the findings of Knight, Loayza and Villanueva (1993), Ahmed and Miller (2000), Ramirez and Nazmi (2003) and Amanja and Morrissey (2005) who report that public investment is positively associated with economic growth in developing countries.

Now the results of fiscal variables, in which we are interested more, are discussed. Table 5.2 clearly brings out that the method of financing has a crucial role in determining the effects of government spending on economic growth. It is found that tax financed increases in public spending is negatively associated with per capita GDP growth. The findings of Barro (1990) support our results. He states that tax financed public spending, mainly income tax on investment reduce profits on private investment, and thus affect growth negatively. However, Miller and Russek (1997) report results that are contrary to our findings. They conclude that tax financed expenditure are pro growth for the group of developing countries.
It is also found that debt financed increases in government expenditure also affect growth negatively. Similar conclusion is reached by Miller and Russek (1997) who point out that debt financed increases in public spending are negatively associated with growth in developing countries. Likewise, Siddiqui & Malik (2001) conclude that debt accumulation has affected growth negatively in Pakistan, India and Sri Lanka. They also report that all the debt indicators show significant negative relationship with growth.

As well as money financed expenditure are concerned, the findings are not different from the previous two findings. It is concluded that money financed expenditure produces a significant decrease in economic growth for selected South Asian countries. The similar results are also reported by Bose, Holman and Neanidis (2005). They conclude that seigniorage financed public expenditure retards growth in developing countries.

Decomposition of public expenditure into different components to examine their individual impacts on economic growth when financed thorough different sources reveals some interesting findings. Results reported in table 5.3 show that defense expenditure hurts growth negatively whichever source is employed to finance this expenditure. Public education and public health expenditure have insignificant effect on growth when financed through any source. The former has negative while the latter has positive sign. These findings are also partially in line with the findings of Miller and Russek (1997) who report that debt financed increases in defense expenditure retard economic growth in developing countries. They also report that debt financed increases in public education and health expenditure have negative effect on economic growth in developing countries.
### Table 5.3

**Results with Disaggregated Public Expenditure Using Fixed Effect Model (FEM)**

Per Capita GDP Growth is the Dependent Variable

<table>
<thead>
<tr>
<th></th>
<th>Tax Finance</th>
<th>Debt Finance</th>
<th>Money Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defense Expenditure</td>
<td>-0.549***</td>
<td>-0.622***</td>
<td>-0.779***</td>
</tr>
<tr>
<td></td>
<td>[-1.76]</td>
<td>[-1.91]</td>
<td>[-1.77]</td>
</tr>
<tr>
<td>Public Education Expenditure</td>
<td>-0.604</td>
<td>-0.749</td>
<td>-0.947</td>
</tr>
<tr>
<td></td>
<td>[-0.57]</td>
<td>[-0.63]</td>
<td>[-0.73]</td>
</tr>
<tr>
<td>Public Health Expenditure</td>
<td>0.277</td>
<td>0.225</td>
<td>0.083</td>
</tr>
<tr>
<td></td>
<td>[0.42]</td>
<td>[0.12]</td>
<td>[0.05]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.128**</td>
<td>0.126**</td>
<td>0.126**</td>
</tr>
<tr>
<td></td>
<td>[2.44]</td>
<td>[2.42]</td>
<td>[2.44]</td>
</tr>
<tr>
<td>Population</td>
<td>0.026</td>
<td>0.086</td>
<td>0.146</td>
</tr>
<tr>
<td></td>
<td>[0.02]</td>
<td>[0.05]</td>
<td>[0.09]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.123***</td>
<td>0.124</td>
<td>0.127***</td>
</tr>
<tr>
<td></td>
<td>[1.81]</td>
<td>[1.21]</td>
<td>[1.91]</td>
</tr>
<tr>
<td>R-square</td>
<td>0.491</td>
<td>0.490</td>
<td>0.491</td>
</tr>
<tr>
<td>F-test</td>
<td>1.93</td>
<td>1.92</td>
<td>1.93</td>
</tr>
</tbody>
</table>

*, **, *** mean significantly different from zero (two tailed test) at 1%, 5% and 10% level respectively. T. statistics are in parenthesis.

The results derived from the analysis highlight the relative importance of different sources of financing public expenditure in context of economic growth. It is concluded that though expenditure exert negative effect financed through any source on growth yet they can be ranked according to their relative effects. Tax financed expenditure hurts growth least followed by debt financed and seigniorage financed expenditure. This ranking is based on the magnitude of the coefficients attached with public expenditure and its sub components in
different specifications. The negative effect of seigniorage is largest as compare to debt financed and tax financed public expenditure ($|\cdot0.51| > |\cdot0.40| > |\cdot0.33|)$.

Likewise, the magnitude of the defense expenditure coefficients tells the story that is not different from the total public expenditure. Defense expenditure when financed through seigniorage hurts growth more as compare to its counter parts i.e., tax and debt ($|\cdot0.78| > |\cdot0.62| > |\cdot0.55|)$). Our findings are in harmony with the previous empirical literature. For example De Gregorio (1993) states that money financing of government spending is more growth reducing than bond financing. Similarly Miller and Russek (1997) state that debt financed expenditure retard growth in developing countries. Barro (1990) finds that tax financed public expenditure have negative effect on economic growth. Bose, Holman and Neanidis (2005) report that seigniorage financed public expenditure affect growth more negatively if it were financed through taxes.

The findings that public expenditure is negatively correlated with economic performance in South Asia mentions the inefficiency of the public sector in this region. The reason of this negative effect of public expenditure on growth may be the higher share of non development expenditure in total expenditure. Furthermore, politicization of public resources can also explain this negative relationship between public expenditure and economic growth. It is also possible that the government size may have risen above the threshold level. The larger negative effect of monetization of public deficit reveals that the high inflation has caused much to these economies. Tax financed expenditure hurt least which shows that there is room to bridge fiscal deficit by enhancing the efficiency of tax system and increase in tax revenue. It can
be achieved by broadening the tax base that is too narrow to generate government revenues to finance its expenditure.

Defense expenditure also hurts growth whether it is financed through taxes, debt or seigniorage. The larger share of defense expenditure in non developmental expenditure explains the negative effect of defense expenditure on economic activity. It is suggested that the defense expenditure need to be decreased that will make room for more allocation of resources towards human capital that is not in a satisfactory position currently in this region. The non economic solution to the Kashmir dispute between two bigger economies of the region can help great in reducing the defense expenditure. The meager share of education and health expenditure in this region can explain the insignificant effect of this expenditure on economic performance. Therefore, it is suggested that education and health needs to be addressed on priority bases that in turn can trigger growth in South Asia.

In addition to above mentioned reasons, a number of other factors can further help explain the negative effect of public expenditure on economic growth in South Asia; first, some fiscal measures did not have specific expenditure ceilings or timeframes, raising concern about their temporary nature.\(^\text{72}\) Second, automatic stabilizers are leading to a slowing of growth in fiscal revenues and widening fiscal deficits (Carrasco et al 2010). Third, despite enormous responsibilities reposed in fiscal policy, resources available for fiscal policy in South Asian countries are quite meager.\(^\text{73}\) Resultantly, the expediency rather than efficiency considerations

---

\(^\text{72}\) “Although most South Asian countries were in the process of fiscal consolidation in the last few years, debt-to-GDP ratios remain high, albeit decreasing somewhat in the last few years” (Carrasco et al, 2010).

\(^\text{73}\) “Revenue to GDP ratios for South Asian countries are less than half that for rich countries and even lower than those for lower middle income countries” (Jaha, 2010).
often guide tax decisions. Fourth, often poorly targeted and wasteful current subsidies are intense and hard to resist (Jaha, 2010). Fifth, there have been weak or very little coordination between fiscal and monetary authorities and resultantly both policies have been executed independently with counterfeiting effects (Nasir et al, 2010; Arby and Hanif, 2010).

5.4.1- Analysis with Alternative Measures of Seigniorage:

Now we re-do the previous exercise with two alternate measures of seigniorage74 to check the robustness of our base line results. The results are reported in table 5.4.

---

Table 5.4
Results with Alternative Seigniorage Measures Using Fixed Effect Model (FEM)
Per Capita GDP Growth is the Dependent Variable
(Aggregated Level of Public Expenditure)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Public expenditure</td>
<td>-0.510***</td>
<td>-1.157***</td>
<td>-1.271***</td>
</tr>
<tr>
<td></td>
<td>[-1.67]</td>
<td>[-1.70]</td>
<td>[-1.81]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.102**</td>
<td>0.099**</td>
<td>0.099**</td>
</tr>
<tr>
<td></td>
<td>[2.44]</td>
<td>[2.40]</td>
<td>[2.41]</td>
</tr>
<tr>
<td>Population</td>
<td>0.537</td>
<td>0.439</td>
<td>0.331</td>
</tr>
<tr>
<td></td>
<td>[0.48]</td>
<td>[0.41]</td>
<td>[0.31]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.150***</td>
<td>0.142***</td>
<td>0.139***</td>
</tr>
<tr>
<td></td>
<td>[1.77]</td>
<td>[1.69]</td>
<td>[1.68]</td>
</tr>
<tr>
<td>F-test</td>
<td>2.09</td>
<td>2.15</td>
<td>2.16</td>
</tr>
</tbody>
</table>

(Disaggregate Level of Public Expenditure)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Defense Expenditure</td>
<td>-0.779***</td>
<td>-1.233***</td>
<td>-1.366***</td>
</tr>
<tr>
<td></td>
<td>[-1.77]</td>
<td>[-1.76]</td>
<td>[-1.88]</td>
</tr>
<tr>
<td>Public Education Expenditure</td>
<td>-0.947</td>
<td>-1.466</td>
<td>-1.767</td>
</tr>
<tr>
<td></td>
<td>[-0.73]</td>
<td>[-1.03]</td>
<td>[-1.16]</td>
</tr>
<tr>
<td>Public Health Expenditure</td>
<td>0.083</td>
<td>-0.709</td>
<td>-0.941</td>
</tr>
<tr>
<td></td>
<td>[0.05]</td>
<td>[-0.35]</td>
<td>[-0.46]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.126**</td>
<td>0.116**</td>
<td>0.114**</td>
</tr>
<tr>
<td></td>
<td>[2.44]</td>
<td>[2.22]</td>
<td>[2.20]</td>
</tr>
<tr>
<td>Population</td>
<td>0.146</td>
<td>0.238</td>
<td>0.296</td>
</tr>
<tr>
<td></td>
<td>[0.09]</td>
<td>[0.14]</td>
<td>[0.18]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.127***</td>
<td>0.128</td>
<td>0.131</td>
</tr>
<tr>
<td></td>
<td>[1.91]</td>
<td>[1.24]</td>
<td>[1.27]</td>
</tr>
<tr>
<td>F-test</td>
<td>1.93</td>
<td>2.30</td>
<td>2.31</td>
</tr>
</tbody>
</table>

*, **, *** mean significantly different from zero (two tailed test) at 1%, 5% and 10% level respectively. T. statistics are in parenthesis.
It is inferred from table 5.4 that results do not change with alternate measures of seigniorage at both aggregated and disaggregated level of public expenditure. The conditional variables have also the same sign and level of significance.

5.5- Concluding Remarks:

Chapter 5 highlights the role of budget constraint in determining the effects of fiscal variables on economic growth in South Asia. It is found that in the presence of budget constraint the effects of fiscal variables become more precise and reliable. Public expenditure financed through different components of budget constraint can affect growth differently. It is concluded that public expenditure affects growth negatively whichever source is used to finance it. However, the relative effect varies as the source of finance differs. Seigniorage has a larger negative effect on growth followed by debt financed and tax financed public expenditure.

Defense expenditure shows negative effect on economic growth irrespective of the source of finance. However, growth is less effected when defense expenditure is financed by tax revenues followed by debt and seigniorage. Public expenditure on human capital has insignificant effect on the economic development of this region. The findings are fully supported by the previous empirical studies by Barro (1990), Miller and Russek (1997), Bose, Holman, Neanidis (2005) and Ahmed and Miller (2000).

These findings put question mark on the efficient role of public sector in South Asian economies. In the light of these findings it seems plausible to reduce budget deficit by curtailing expenditure and keeping revenues constants. This can be achieved by redefining the role of
governments in this region. Restructuring and overhauling of the fiscal systems can also improve the resource generation in the region. In the current scenario increase in tax revenues is the least costly option available with the governments to finance their expenditure.
CHAPTER 6
OPTIMAL LEVEL OF PUBLIC EXPENDITURE/TAXES IN SELECTED SOUTH ASIAN COUNTRIES

The results obtained in chapters, 4 and 5 raise eyebrows on the role of government in context of economic growth in South Asian economies. Chapter 4 concludes that, in general, government expenditure, its sub components and per capita GDP are not associated in the long run in many of the sample countries. Chapter 5 further endorses the results of chapter 4 by concluding that public expenditure, financed through any source, affect growth negatively. These results call for the determination of the optimal size of government in these economies. Chapter 6 estimates the optimal level of public expenditure/taxes maintaining balanced as well as unbalanced budget assumptions. The chapter proceeds as follows. Section 6.1 gives a brief introduction of the issue. Section 6.2 explains the concept of optimally sized government. Section 6.3 & 6.4 describe data and analytical framework respectively. Section 6.5 deals with estimation and results while section 6.6 comprises some concluding remarks about the chapter.

6.1- Introduction:

Historical evidence reveals that no society gained high level of economic prosperity without the role of government. The societies without proper governments faced different kinds of anarchy that halted their growth over time. The emergence of governments in these societies ensured rule of law and protected property rights that led to high level of economic development. Thus, the role of government remains important for the economic prosperity of the nations.
On the other hand the societies where all economic decisions were made by the governments, witnessed relatively low level of economic affluence because large government stifled the spirit of private agent that resulted in low level of economic development. Put differently the economic prosperity is limited both at zero and hundred percent level of government. Therefore question arises; whether the government should be too large or too small?

Empirical as well as theoretical literature have focused on the level and composition of government spending and yielded conflicting results in recent decades. A group of economist believes that large government size stimulates economic growth (Ram, 1986, 1989; Rubinson, 1977) among others. On the other hand, some economists deny this phenomenon and conclude that as the size of government increases in relative term it reduces the growth of per capita income (Landau, 1983, 1986; Barro, 1991). Bairam (1990) reports positive effects of large government size for some economies and negative effects for the others. Grossman (1990) concludes that government can affect growth positively as well as negatively. However, within this diversity of explanations a consensus emerges that up to a certain level, government activities are pro growth but beyond this point the size of government may reduce economic well-being. The debate concentrates on the question that at what point the public expenditure become counterproductive.
Only a handful of studies have attempted to determine the optimal level of public expenditure for developed countries. These studies assume that governments make balance budgets. This assumption becomes critical in case of developing countries where large deficits persist. Therefore, this chapter estimates the optimal level of public expenditure in Pakistan, India, Sri Lanka and Nepal assuming balanced as well as unbalanced budget for the period 1975-2008. This will help the policy makers to increase/decrease public expenditure, as a percent of GDP, to bring the government size closer to the optimal level.

6.2- What Does the Optimal Size of Government Mean?

Main stream economic theory of the relationship between government spending and economic growth suggests that the negative effects are expected in the economies where the size of government, measured as a percent of gross domestic product, exceeds a certain level (Barro 1991). The hallmark of endogenous growth models is that they first investigated the non-linear relation between public spending and economic growth. For example in an endogenous framework, Barro (1990) shows that public spending enhances the marginal productivity of capital which in turn raises economic growth. At the same time an increase in taxes retards economic growth through crowding out effects. However, the first positive effect remains dominant when the government is small while the negative effects of taxes dominate when the size of government becomes larger. Thus, there is an evidence of a non-linear relation between

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75 Scully (2003) reports that optimal tax rate in USA is 19.3 % of GDP. Scully (1991) finds that on average, countries reach their maximum economic growth when they take no more than 19.3% of GDP in taxes (103 countries). The optimum level of public spending in Canada is 34 % of GDP (Chao & Grubal, 1998).
government size and economic growth and there exist a point that maximizes the growth. He states that this point occurs where the marginal product of government services equals unity.

Latter a few studies also verified the non monotonic relationship between government size and economic growth. For example Yavas (1998) pointed out that an increase in public spending will lower the study state level of output if the economy is already at high steady state and vice versa. He supports his argument by saying that in less developed countries, bulk of the government expenditure is allocated towards the building of primary infrastructure that enhances productivity of the private sector. On the other hand in developed countries a large portion of government spending is spent on social security services as these countries are already rich in infrastructure. Therefore, expenditure on infrastructure has more positive effect on private output than if this expenditure is made on social security services.

Borrowing a graphical technique from Laffer, Army popularized the notion of optimal size of government by developing a so-called Armey curve in 1995. He states that the absence of government, zero percent government, creates threat of expropriation that restricts incentive to work, save and invest. On the other hand when all decisions are monopolized by the government, hundred percent governments, the level of per capita output remains low. However, when private and public sector share the decision making in allocation of resources and play their respective role in economic activity, the output level is higher than the previous two extremes.

The Army curve describes that output increases with the increase in government size up to a certain level and then decreases. Why this happens? Chao and Grubel (1998) explain this
phenomenon. They argue that with the growth of government size law of diminishing returns operates. More and more resources are withdrawn from private sector to upgrade already existing primary infrastructure that has no additional positive effect on output. Besides, to finance increased government expenditure low tax rates have to be increased which impose increasing burden by stifling the spirit of private sector’s incentive to save and invest.

**Figure 6.1**

*Army Curve, 1995*

![Graph showing the relationship between rate of economic growth and size of government (% of GDP)]


6.3-Data:

In this chapter four series namely GDP, public expenditure, deficit and tax revenues are used in the analysis. From public expenditure, tax revenues and deficit we construct some other variables which show the share of private sector in total output. These variables have been taken from two sources. GDP is from World Development Indicators (WDI) and the rest of variables are from Government Finance Statistics (GFS).

6.4- Analytical Framework:

The analysis employs the methodology of Scully (1994 & 2006) and Heerden & Scheoman (2008) to find the threshold level of government expenditure/taxes. The mathematical formulation is based on a non linear Cobb-Douglas production function with a public sector and a private sector. The public sector provides goods financed with tax revenues i.e. \( \frac{G}{Y} = \tau \) and 1-\( \tau \) is the share retained by private agents after taxation. Both public and private goods contribute to output.

\[ \]

\[ \]

---

76 Under balanced budget assumption, we subtract share of government from total output, GDP, to get the share of private sector in output. Similarly, under unbalanced budget approach share of taxes and deficit is subtracted from the total output to measure the share of private sector in output.

77 Cobb-Douglas production function is widely used in economics because of its ability to show accurately many empirical phenomena and because of its convenient mathematical properties.

78 Under the assumption of balanced budget government expenditures are equal to tax revenues.
6.4.1: Scenario 1- Balanced Budget:

The mathematical formulation of this relation is described as under;

\[ Y = A(G/Y)^\alpha (1 - \tau)^\beta \] \hspace{1cm} (6.1)

Where

\( Y = \) Gross Domestic Product
\( G = \) Government expenditure
\( \tau = \) Tax to GDP ratio
\( A = \) Total factor productivity
\( \alpha = \) Relative share of government sector in total output
\( \beta = \) Relative share of private sector in total output

In logarithmic form equation (6.1) can be written as;

\[ \ln Y = \ln A + \alpha \ln(G/Y) + \ln(1 - \tau) \] \hspace{1cm} (6.2)

By definition \( G = tY \), therefore substitution into equation (6.2) yields;

\[ \ln Y = \ln A + \alpha \ln t + \beta \ln(1 - \tau) \] \hspace{1cm} (6.3)

To find growth maximizing tax rate, we differentiate equation (6.3) with respect to \( \tau \) and set it equal to zero.
\[ \partial \ln Y / \partial \tau = \alpha / \tau - \beta / 1 - \tau = 0 \]

Rearranging terms;

\[ \alpha / \tau = \beta / 1 - \tau \]

\[ \beta \tau = \alpha (1 - \tau) \]

\[ \beta \tau = \alpha - \alpha \tau \]

\[ \alpha \tau + \beta \tau = \alpha \]

\[ \tau (\alpha + \beta) = \alpha \]

\[ \tau^* = \frac{\alpha}{\alpha + \beta} \] (6.4)

### 6.5- Estimation and Results:

We estimate equation (6.3) by Ordinary Least Square (OLS) method to find values of the parameters \( \alpha \) & \( \beta \) for each country. As usual ADF unit root test is applied on each variable to test for stationarity. The ADF unit root test results are reported in table 6.1. It clearly brings out that the variables are non stationary at level but stationary at first difference.
Table: 6.1

ADF Unit Root Test Results for Pakistan, India, Sri Lanka and Nepal
(At Level)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pakistan</th>
<th>India</th>
<th>Sri Lanka</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>C &amp; T</td>
<td>C</td>
<td>C &amp; T</td>
</tr>
<tr>
<td>$lnY$</td>
<td>-0.31</td>
<td>-3.15</td>
<td>-0.61</td>
<td>-1.74</td>
</tr>
<tr>
<td>$ln\tau$</td>
<td>-0.87</td>
<td>-1.73</td>
<td>2.21</td>
<td>-2.15</td>
</tr>
<tr>
<td>$ln(1 - t)$</td>
<td>-0.35</td>
<td>-3.19</td>
<td>-0.58</td>
<td>-1.79</td>
</tr>
</tbody>
</table>

(At First Difference)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pakistan</th>
<th>India</th>
<th>Sri Lanka</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>C &amp; T</td>
<td>C</td>
<td>C &amp; T</td>
</tr>
<tr>
<td>$lnY$</td>
<td>-5.18*</td>
<td>-5.10*</td>
<td>-3.81*</td>
<td>-3.78**</td>
</tr>
<tr>
<td>$ln\tau$</td>
<td>-6.49*</td>
<td>-5.27*</td>
<td>-4.80*</td>
<td>-4.67*</td>
</tr>
<tr>
<td>$ln(1 - t)$</td>
<td>-5.59*</td>
<td>-5.50*</td>
<td>-3.87*</td>
<td>-3.79**</td>
</tr>
</tbody>
</table>

Note: C and T denote constant and trend respectively. *, **, *** mean significantly different from zero (two tailed test) at the 1%, 5% and 10% level respectively.

As mentioned in chapter four, estimation of regressions having non stationary variables by OLS produces spurious results. Therefore, we make variables stationary by taking their first difference before using OLS. The OLS estimation output is presented in table 6.2.
Table 6.2

OLS Estimation Output for Pakistan, India, Sri Lanka and Nepal

$\Delta \ln Y$ is the Dependent Variable

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pakistan</th>
<th>India</th>
<th>Sri Lanka</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.002</td>
<td>-0.006</td>
<td>0.002</td>
<td>-0.002**</td>
</tr>
<tr>
<td></td>
<td>[1.150]</td>
<td>[-0.575]</td>
<td>[1.439]</td>
<td>[-1.827]</td>
</tr>
<tr>
<td>$\Delta \ln \tau$</td>
<td>0.212*</td>
<td>0.183*</td>
<td>0.276*</td>
<td>0.183*</td>
</tr>
<tr>
<td></td>
<td>[3.953]</td>
<td>[4.163]</td>
<td>[3.170]</td>
<td>[2.656]</td>
</tr>
<tr>
<td>$\Delta \ln(1 - \tau)$</td>
<td>0.775*</td>
<td>0.821*</td>
<td>0.714*</td>
<td>0.828*</td>
</tr>
<tr>
<td></td>
<td>[4.332]</td>
<td>[3.490]</td>
<td>[2.725]</td>
<td>[4.613]</td>
</tr>
<tr>
<td>R-Square</td>
<td>0.946</td>
<td>0.978</td>
<td>0.967</td>
<td>0.953</td>
</tr>
<tr>
<td>DW</td>
<td>2.161</td>
<td>1.813</td>
<td>1.955</td>
<td>2.223</td>
</tr>
</tbody>
</table>

*Note: $\Delta$ is the first difference operator. *, ** mean significantly different from zero (two tailed test) at the 1% and 5% level respectively. T-statistics are in parenthesis.

In table 6.2 the estimated values of the regression coefficients are presented. From these values we calculate the optimal level of public expenditure for each country using equation 6.4.

The estimated optimal levels of public expenditure are presented against the current levels of public expenditure, in 2008, for Pakistan, India, Sri Lanka and Nepal in table 6.3. The table also shows the possible scope for decrease in public expenditure to attain the optimal size of government.
Table 6.3

Optimal and Current Level of Public Expenditure in Selected South Asian Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Optimal Level of Public Expenditure (% of GDP)</th>
<th>Level of Public Expenditure in 2008 (% of GDP)</th>
<th>Percentage Scope to Decrease Public Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>21.48</td>
<td>22.6</td>
<td>-4.96</td>
</tr>
<tr>
<td>India</td>
<td>18.23</td>
<td>19.10</td>
<td>-4.56</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>27.89</td>
<td>29.38</td>
<td>-5.07</td>
</tr>
<tr>
<td>Nepal</td>
<td>18.10</td>
<td>19.50</td>
<td>-7.18</td>
</tr>
<tr>
<td>Average</td>
<td>21.43</td>
<td>22.65</td>
<td>-5.39</td>
</tr>
</tbody>
</table>

From table 6.3, it is clear that the current size of government in South Asian countries is higher, though very small, than the estimated optimal level and there is room for reduction in public spending in all the countries with varying degree. On average, there is a scope of 5.39 percent to reduce public expenditure in this region.

The estimated threshold level of public expenditure is highest in Sri Lanka followed by Pakistan, India and Nepal. The difference in optimal level across countries may be attributed to the stages of development. Sri Lanka differs with other economies as it is a middle income economy while other countries are ranked as low income economies. “Sri Lanka’s social indicators, such as life expectancy, literacy and mortality rates, are well above those in comparable developing countries and are on par with many developed countries. In terms of the Human Development Index (HDI) Sri Lanka ranked 96th with an index of 0.740 among 177 countries, in 2004. The sectoral composition of the economy has changed from that of an agriculture based economy to one dominated by the services sector” (National poverty reduction and growth strategy report, 2004). “Also, Sri Lanka’s governance indicators outpaced
those in most South Asian economies and it has consistently scored better than other South Asian economies on voice and accountability, control of corruption, rule of law, and regulatory quality. These indicators support strong economic performance in Sri Lanka” (IMF country report, 2007).

The small difference in estimated level of public expenditure in India and Nepal shows that these countries are facing more or less the same social, economic and ethnic circumstances over the years. However, it can be concluded that Pakistan’s public sector has performed comparatively better than India and Nepal as it has higher threshold level of public expenditure. It is also evident from the conclusion reached by Haque and Monteil (1993) that Pakistan’s annual average growth rate is not only higher than all other developing countries but also higher than the average of Asian developing countries.

Our estimates of optimal size of governments are in line with the findings of Friedman (1997) who states that the optimal size of governments ranges from 15 to 50 percent of gross domestic product. Similarly our results match the findings of Scully (2003) who reports that optimal tax rate in USA is 19.3 % of GDP. Likewise, in another study Scully (1991) finds that on average, countries reach their maximum economic growth when they take no more than 19.3% of GDP in taxes (103 countries). The findings of Vedder and Lowell (1998) and Mavrov (2007) also support our findings.79

A historical look at the size of government shows that for many years government size has been above/lower the threshold size of government in South Asia. In Pakistan, government

79 Scully (1994) finds that when the average tax rate is between 21.5 and 22.9 percent of GNP, the growth rate is maximized in US. Gunalp and Dincer (2005) report that the threshold government size ranges from 14.3 to 20.3 % of GDP in transition economies.
size has been larger than the optimal size in the last three decades. Therefore, it has shrunk the private sector over time that led to slow economic growth. In India the mix trend has been witnessed. Most of the time government size remained closer to the threshold level. In the first decade (1975-1985) the size of Indian government was higher but later it reduced gradually and just went below the optimal level. Recently, it is gaining momentum again and stands just above the threshold level. India has earned dividends of this right size of government in shape of stable and rapid economic growth in recent past.

Sri Lanka has the highest optimal level of public expenditure that proves efficiency of its public sector. However, for many years public expenditure as a share of GDP remained higher than the estimated threshold level that has caused much to its economy. Nepal paints a different picture. It has just gained the optimal level of public expenditure recently. Generally its size remained below the optimal level. It shows that successive governments in Nepal remained unable to provide goods and services to its poor population up to the required level. Generally, it can be said that had government size been optimal in South Asia, this region would have earned much more economic dividends than present.

The comparison of optimal size of governments in developing and developed countries seems useful. Here, we present international evidence on the optimal size of governments in developed countries. Table 6.4 serves this job.
### Table 6.4

**Optimal Level of Public Expenditure in Developed Countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Size of government (% of GDP, 1996)</th>
<th>Optimum size (% of GDP)</th>
<th>Percentage in spending as a share of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>44.90</td>
<td>37.09</td>
<td>-17.39</td>
</tr>
<tr>
<td>France</td>
<td>54.73</td>
<td>42.90</td>
<td>-21.62</td>
</tr>
<tr>
<td>Finland</td>
<td>58.74</td>
<td>38.98</td>
<td>-33.64</td>
</tr>
<tr>
<td>Sweden</td>
<td>65.02</td>
<td>45.95</td>
<td>-29.31</td>
</tr>
<tr>
<td>Germany</td>
<td>48.72</td>
<td>38.45</td>
<td>-21.08</td>
</tr>
<tr>
<td>Ireland</td>
<td>39.60</td>
<td>42.28</td>
<td>+6.77</td>
</tr>
<tr>
<td>Netherlands</td>
<td>51.97</td>
<td>44.86</td>
<td>-13.68</td>
</tr>
<tr>
<td>Belgium</td>
<td>52.97</td>
<td>41.91</td>
<td>-20.88</td>
</tr>
</tbody>
</table>

**Average percentage change** -18.85

Reproduced from Pevcin (2004)

The comparison of table 6.3 with table 6.4 shows some differences as well as similarities. The estimated optimal size of governments differs significantly across developed and developing countries. However, it is common that current size of governments is above the estimated optimal size in both groups of countries. In each country scope for reduction in public expenditure exists except from Ireland. Ireland is the country where government size is below the threshold level. The high optimal level of public expenditure in industrialized countries is due to the efficiency of the public sectors that keep the functioning of downward sloping part of Scully curve away for a longer time. Contrary to this in developing countries due to many factors efficiency of government remains low and the negative effect of public expenditure starts at a lower level than the developed countries.
The comparison of estimated optimal level of public expenditure between South Asian countries and developed countries differs at least in one aspect; the scope for reduction in government size in developed countries is much higher than in South Asian countries. It means that in South Asia, the level of public expenditure, measured as a percent of GDP, is not as large as in many other comparable countries of the world. For example Jaha (2010) states that Public expenditure to GDP ratio in high income countries is almost twice as high as in South Asian countries. Even low middle income countries had higher public expenditure to GDP ratio than South Asian countries. Therefore, revolutionary changes are not required in public expenditure mechanism to achieve the threshold size of government; only fiscal discipline can help reduce the public expenditure to required level. The small scope in reducing public expenditure to the estimated threshold level is also supported by the view that public expenditure are downward rigid in developing counties due to political pressure for specific public expenditure and wasteful current subsidies (Jaha, 2010).

6.5.1- Reliability Analysis:

Auto correlation is a common phenomenon in time series analysis. The Durban Watson statistics reported in table 6.2 shows that residuals are not correlated. This test is valid as there is no lagged dependent variable in the estimated equation. In addition, we perform some other tests to check the reliability of the results. The outcomes of these tests are reported in appendix VIII.

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80 For more detail see Scully (1995).
The results of different test show that our model has no specification error and residuals are not correlated. No Heteroskedasticity is found and on the basis of Jarque-Bera test it is concluded that residuals are normally distributed. In the presence of above tests results, it can be concluded that our estimates of regression coefficients are reliable and need not to be adjusted.  

6.5.2: Scenario 2- Unbalanced Budget:

Building on the same analogy discussed in section 6.4.1 and assuming unbalanced budget, the non linear Cobb-Douglas production function presented in equation (6.1) takes the following form;

\[ Y = A(t)\alpha (\theta)^\beta (1 - \theta - \tau)^\gamma \]  \hspace{1cm} (6.5)

Where

\[ \alpha = \text{Relative share of taxes in total output} \]

\[ \beta = \text{Relative share of deficit in total output} \]

\[ \gamma = \text{Relative share of private sector in output} \]

\[ \theta = \text{Deficit to GDP ratio} \]

In logarithmic form equation (1) can be written as;

\[ \ln Y = \ln A + \alpha \ln(\tau) + \beta \ln(\theta) + \gamma \ln(1 - \tau - \theta) \]  \hspace{1cm} (6.6)

---

81 In case of non stationary variables the t-statistics are not reliable. Similarly coefficients have to be adjusted if they are obtained from the co-integration model where variables are non stationary (Heerden et al 2008).

82 All other variables have the same definition discussed in section 6.4.1.
The growth maximizing tax rate is:

\[ \tau^* = \frac{\alpha(1 - \theta)}{\alpha + \gamma} \]  

As previously done we estimate equation (6.6) by OLS to find the regression coefficients and use them in equation (6.7) to find the level of growth maximizing tax rate. The OLS results are reported in table 6.5.

### Table 6.5

**OLS Estimation Output for Selected South Asian Countries**

\( \Delta \ln Y \) is the Dependent Variable

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pakistan</th>
<th>India</th>
<th>Sri Lanka</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td>0.007*</td>
<td>0.001</td>
<td>0.016*</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td>[2.50]</td>
<td>[0.559]</td>
<td>[3.213]</td>
<td>[0.136]</td>
</tr>
<tr>
<td>( \Delta \ln \tau )</td>
<td>0.110*</td>
<td>0.110*</td>
<td>0.166*</td>
<td>0.112*</td>
</tr>
<tr>
<td></td>
<td>[3.091]</td>
<td>[2.120]</td>
<td>[4.177]</td>
<td>[3.955]</td>
</tr>
<tr>
<td>( \Delta \ln \theta )</td>
<td>0.051*</td>
<td>0.048*</td>
<td>0.071*</td>
<td>0.036*</td>
</tr>
<tr>
<td></td>
<td>[2.447]</td>
<td>[3.589]</td>
<td>[3.766]</td>
<td>[4.403]</td>
</tr>
<tr>
<td>( \Delta \ln(1 - \theta - \tau) )</td>
<td>0.781*</td>
<td>0.831*</td>
<td>0.762*</td>
<td>0.849*</td>
</tr>
<tr>
<td></td>
<td>[4.988]</td>
<td>[3.735]</td>
<td>[2.806]</td>
<td>[3.762]</td>
</tr>
<tr>
<td>R-Square</td>
<td>0.987</td>
<td>0.950</td>
<td>.989</td>
<td>0.971</td>
</tr>
<tr>
<td>DW</td>
<td>2.15</td>
<td>1.996</td>
<td>2.29</td>
<td>2.25</td>
</tr>
</tbody>
</table>

**Note:** \( \Delta \) is the first difference operator. t- Statistics are in parenthesis. *mean significantly different from zero (two tailed test) at the 1% level.

The OLS estimation output presented in table 5.5 clearly brings out that all the regression coefficients are highly significant. The optimal level of taxes is obtained for selected

---

83 For derivation of equation (6.7) see appendix IX.
South Asian countries by using the values of regression coefficients in equation 6.7.\textsuperscript{84} The growth maximizing tax rates with current sizes of taxes are given in table 6.6.

**Table 6.6**
Threshold and Current Level of Taxes in Pakistan, India, Sri Lanka and Nepal

<table>
<thead>
<tr>
<th>Country</th>
<th>Optimal level of taxes (%) Of GDP When Deficit is 1.5% of GDP</th>
<th>Current size of taxes in 2008 (%) of GDP</th>
<th>Percentage scope to increase taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>12.16</td>
<td>9.64</td>
<td>+26.14</td>
</tr>
<tr>
<td>India</td>
<td>11.51</td>
<td>8.92</td>
<td>+29.04</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>17.62</td>
<td>15.96</td>
<td>+10.40</td>
</tr>
<tr>
<td>Nepal</td>
<td>11.48</td>
<td>10.39</td>
<td>+10.49</td>
</tr>
<tr>
<td>Average</td>
<td>13.19</td>
<td>11.23</td>
<td>+17.45</td>
</tr>
</tbody>
</table>

Table 6.6 highlights a common trend regarding estimated optimal and current level of taxes in South Asia. In all countries the estimated threshold level of taxes is higher than the current size of taxes. This suggests a scope for each country to increase level of taxes to maximize the growth. In India and Pakistan there is a scope of more than 25% to increase taxes. However, in Sri Lanka and Nepal the scope to increase taxes is only 10%. On average, in this region, 18% increase has been suggested to attain the growth maximizing tax rate.

The results obtained in case of threshold level of taxes and public expenditure reveal some similarities as well as some differences regarding the fiscal discipline in the region.\textsuperscript{85} For

\textsuperscript{84} The value of $\theta$, deficit to GDP ratio, is arbitrary. However, Adam and Beven (2005) estimate the threshold level of deficit for 45 developing countries as 1.5% of GDP. Therefore, we also use value of $\theta$ equal to 1.5%.

\textsuperscript{85} Capacity to tax, usually, measured by the tax-to-GDP ratio, depends upon the type of government, the nature of the state, the role it wants to play in the individual life of its citizens, the type of economy, etc. (Arshad, 2011).
example, optimal level of taxes and public expenditure is almost same in India and Nepal, table 6.3 and 6.6, which strengthens the argument that these countries have gone through the similar socio-economic circumstances over the years. Similarly, the higher threshold level of taxes as well as public expenditure in Sri Lanka tells a consistent story that it has a well efficient and managed tax system in addition to efficient public sector in comparison with its neighboring countries. In addition, the smaller scope to increase taxes to attain growth maximizing tax rate supports the view that tax system in Sri Lanka is working almost at its potential and introduction of simple reforms in the tax system can help achieve the required level of taxes. Like Sri Lanka, the scope to increase tax to GDP ratio to catch the optimal level of taxes is also small in Nepal. However, the interpretation of this result differs than that of Sri Lanka as the Nepal economy has several unique features; for instance, it is one of the highly liberalized economies in South Asia. Trade is completely deregulated (Narayan, 2011) that has reduced its potential to generate tax revenue. Furthermore, it is least diverse economy in the region and consistent foreign aid constitute significant share of its budgetary requirement. This fact releases much of the budgetary pressure on the revenue side and authorities show less interest to introduce reforms in the tax system to attain the higher tax to GDP ratio.

Coming to dissimilarities in results, the larger scope to increase tax to GDP ratio to achieve the optimal level of taxes in India and Pakistan as compare to Sri Lanka and Nepal shows that the two bigger economies of the region are more diverse in nature and potentially can generate more revenues by widening the tax bases along with concrete reforms in the tax

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86 See table 6.3 and 6.6.
systems. Changes in the tax structure to include major sectors of the economy that have so far not matched their contribution to economic growth by a proportionate increase in tax revenue will be a significant step in this regard. Likewise, informal sector constitutes a significant share of the overall economies of these two countries. For instance, the Planning Commission of India estimates that well over 90 per cent of the Indian labor force is employed in the informal sector. The long run sustainable growth can be achieved only if the formal sector expands rapidly. This would increase tax revenues, increase efficiency, encourage the adoption of more sophisticated tax instruments and ameliorate fiscal pressures. In addition to larger size of informal sector, the size of underground economy is also swelling consistently in Pakistan and India leading to high tax evasion. For example Iqbal et al (1998) state that the size of the underground economy increased from 20% of GDP in 1973 to 51% of GDP in 1996 in Pakistan. Tax evasion consequently increased 2% of GDP in 1973 to 6.9% of the GDP. Therefore, squeezing the size of the underground economy will certainly help achieve the suggested optimal level of taxes.

It is also interesting to note that estimated threshold level of taxes in South Asia is less than the developed countries. This suggests that taxes become counterproductive at a lower level than in advanced countries. Inefficient tax systems, low per capita GDP, bad governance

87 The poor countries have sufficient ‘capacity’ in both economic and administrative terms to tax more (Kaldor, 1963)
88 “Many developing countries have a large traditional agricultural sector that is not easily taxed. Other significant components of the potential tax base are often in other equally "hard-to-tax" sectors such as small business and the informal or shadow economy” (Bird and Zolt, 2003).
89 Many transitional and developing countries have a significant informal (shadow) economy that also is largely outside the formal tax structure (IMF country report, 2004; Bird and Zolt, 2003).
and many other economic and non-economic factors are held responsible for this low threshold level of taxes in this region.

Furthermore, the lack of a political consensus on broadening the tax base has prevented any substantive growth in revenues as a percentage of GDP, and the deficit remains high because of the political and administrative inability to raise revenue (Haque and Montiel, 1993). The government’s deliberate attempts to keep a low incidence of taxes to attract more investment can also be one reason for low level of revenues in the region.

Historical look at the tax scenario of this region reveals that these countries have lost much in respect of economic development by not maintaining the level of taxes to the required level. Low tax to GDP ratio forced these governments to run budget deficits that led to mounting debts. Costly debts suppressed economic development in this region.

Our findings under the assumption of unbalanced budget are contrary to the findings regarding developed economies on the issue. We suggest increase in taxes while in developed economies decrease in taxes is suggested to achieve the growth maximizing tax rate. This shows that governments in developed economies are taking much of the private incomes in shape of taxes that hurts spirit to work, save and invest. On the other hand, like other developing economies of the world in South Asia tax to GDP ratio is very small and needs to be increased systematically.

90 “Pakistan’s fiscal history reveals that governments have often receded before mounting pressures from politically important groups such as the feudal, the industrialists and merchants and the military, and have responded to such pressures by making important modifications in the tax and the public expenditure structures” (Bengali, 2002).

91 No study can be found that finds optimal level of taxes assuming unbalanced budget neither for developed nor for developing countries.
6.6- Concluding Remarks:

The size of government, measured as a share of GDP, has been an important issue in recent decades. Despite many studies establish a negative relationship between public spending and economic performance, the main stream economic theory predicts negative effect only in the countries where government size increases a certain level. Thus, there exists a point that maximizes the growth. This chapter measures the optimal level of public expenditure in selected South Asian economies.

The main finding of this chapter is that South Asian economies are facing resource crunch. At one side the current level of public expenditure is above the estimated optimal level while on the other side tax to GDP ratio is less than the growth maximizing tax rate. This has widened the gap between public expenditure and public revenues. Therefore swelling deficit and mounting debts are the outcomes that have halted growth over the years.

Government’s efforts to generate revenues and reduce public expenditure have been ineffective over the years. The reason is the tax evasion, narrow tax base, ineffective tax system, corruption, political use of public resources and some other non economic factors like anarchy that persists in the region. There is scope to reduce public expenditure and increase tax revenues. Increase in tax revenues and decrease in public expenditure can be a panacea to the economic worries of this region.92

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92 “In reality, however, a combination of expenditure control and revenue enhancements might be the most desirable policy choice to achieve a lasting fiscal adjustment in Pakistan” (Haque and Montiel, 1993).
CHAPTER 7
CONCLUSION AND POLICY IMPLICATIONS

It is now time to have a look at the ground covered by this study with an objective to highlight its main findings and state some policy recommendations. Chapter 7 serves this job and proceeds as follows: after this introduction, section 7.1 presents summery and major findings of the study. Section 7.2 lays down policy implications that emerge from the present study. Section 7.3 sets some guidelines for the future research.

7.1- Summary:

This study has focused three specific issues regarding public expenditure growth-nexus in Pakistan, India, Sri Lanka and Nepal for the period 1975-2008. Firstly, whether public expenditure and per capita GDP are related in the long run; and, if not, then what are the determinants of per capita GDP and growth in public expenditure? Secondly, how these economies have managed to finance rising expenditure and which source of finance is relatively less costly to bridge widening revenue expenditure gap. Lastly, is the size of government optimal and whether growth maximizing tax rate have been achieved by these economies over the years? Literature reviewed in chapter 2 serves as a background to the present study and highlights the main areas of research. The chapter draws out that developed countries have been the main focus of research and ample room exists to conduct research on the issue regarding developing countries. The present study undertakes the task.
Then the attention was placed, in chapter 3, on the growth and fiscal experiences of the selected South Asian countries. It was evident that growth history in these countries shows a mixed trend. Pakistan showed exceptional growth in some decades while these gains were lost in the other decades. Sri Lankan growth path was more volatile as comparison with other neighboring countries of the region. However, India experienced a consistent and sustainable growth rate for many years in its economic history. Growth story in Nepal is not much different from Pakistan and Sri Lanka. The chapter shows that fiscal scenario in these countries is broadly similar. Severe fiscal deficits and mounting public debts are the major economic concerns of this region. The public debts in these economies have reached the unsustainable level especially in Sri Lanka due to their fiscal profligacy. Low tax to GDP ratio has also added to the worries of these nations. Narrow tax base is the major cause of this low tax collection. However, in recent years, especially in Pakistan public finances were restructured that provided fiscal space to some extent. In future these countries will need more resources to mitigate their developmental as well as non developmental expenditure. This can be achieved by mobilizing more domestic resources. Widening tax base and increase in non tax revenues can help in squeezing revenue expenditure gap.

The direction of flow between public expenditure/its sub components and economic activity has been investigated in chapter 4. It concludes that public expenditure shows no long run relation with economic development of these countries with an exception of Sri Lanka. This means that neither public expenditure has caused per capita GDP nor growth in public expenditure can be explained in terms of expansion in economic activity. This shows that growth in public expenditure is determined by some other economic (trade openness,
industrial and investment policies\textsuperscript{93} as well as non economic factors like political pressure, ideological commitments and geopolitical situation of the country. However, in Sri Lanka public expenditure and growth are found to be co-integrated. The causality runs from per capita GDP to public expenditure which shows that growth in economic activity has led to increase in tax collection and public expenditure in Sri Lanka. Granger causality test shows that results do not change significantly in the short run.\textsuperscript{94} The chapter finds that sub components of public expenditure are not linked with per capita GDP at least in the long run. Only in Nepal public education expenditure is co-integrated with per capita GDP. The error correction model favors the Keynesian sense of this relationship. It is clear that public education expenditure has contributed to the economic growth of Nepal over the years. A note worthy aspects of this chapter’s findings is that defense expenditure neither causes nor caused by economic activity in all countries included in the sample. This is the only common finding that works throughout the sample. It mentions that in this region defense expenditure is independent of the stages of development and depends on some other factors.

Chapter 5 places its attention on the relative importance of financing source of public expenditure and concludes that the relationship between public expenditure and economic growth is negative whichever source is used to finance this expenditure. However, the effects differ as the source of finance varies. Though tax, debt, seigniorage financed public expenditure hamper growth yet seigniorage has a larger negative effect on growth than debt financed and tax financed public expenditure. Therefore, financing of public expenditure through taxes is the

\textsuperscript{93} For more detail see appendix II.
\textsuperscript{94} However it is found that some variables show causality in the short run in some countries. This is due to the different policy options exercised in different regimes by the authorities in different countries. For more detail see appendix II.
least costly option available with the governments. However, reduction in public expenditure and increase in tax revenue can pay dividends in terms of growth. The chapter also finds that defense expenditure shows negative effect on economic growth. However, defense expenditure when financed through seigniorage hurts growth more as compared to if it were financed through debt or taxes. Public expenditure on education and health has insignificant effect on economic growth. The findings of this chapter are in line with the general consensus among the researcher that when public expenditure is used as a share of GDP in the regression equation the relationship is generally negative.

Findings of chapter 4 and 5 raise eyebrows on the efficacy of public policies in the region. Therefore, chapter 6 searches for the optimal size of public expenditure/taxes. It is found that the current size of public expenditure in Pakistan, India, Sri Lanka and Nepal is above the estimated optimal level. The threshold level of public expenditure in the sample ranges from 18.10 to 27.89 percent of GDP which shows scope, on average, of 6 percent to reduce public expenditure to attain the threshold level. The chapter also concludes that current tax to GDP ratio is lower than the estimated threshold level of taxes in the region. In India and Pakistan there is scope of more than 25% to increase taxes to achieve the estimated threshold level of taxes. However, in Sri Lanka and Nepal the scope to increase taxes is only 10%. On average, in this region, 18% increase has been suggested to attain the growth maximizing tax rate.

The estimated threshold level of taxes in South Asia is lower as compare to developed countries of the world. Unfriendly environment for taxpayers, complex tax rules, rampant tax evasion, vested discretionary powers of the tax collectors, narrow and rigid tax base, among
others, are responsible for this low threshold level of taxes. In addition, non taxation of the informal economy and pervasive smuggling also keep the threshold level of taxes at lower level.

7.2- Policy Implications:

The main findings of the present study show that role of public policies have not been efficient in South Asia over the years as governments remained unable to address key economic issues like widening resource gap, sky rocketing debts, income inequality and poverty. Governments activities have not been pro growth and the optimal size of government could not be achieved. Tax to GDP ratio remained below the growth maximizing tax rate. This has widened the revenue expenditure gap, squeezed fiscal space and increased public debts that halted the economic growth of these nations. In the light of these findings some policy implications emerge.

Firstly, it can be asserted that in Pakistan, India and Nepal growth in public expenditure is not an outcome of economic development as stated by Wagner. Therefore, many other factors as political and bureaucratic pressures dominated the decision making in these countries. However, Sri Lanka managed to translate its economic development into mobilizing more resources to address human and physical capital. Similarly, government policies have been ineffective to boost economic development mainly due to resource crunch and inefficiency of the public sector. The independence of defense expenditure from level of economic development has worsened this revenue expenditure gap. The need is to develop a mechanism in which public revenues increase with an expansion in economic activity and vice versa. Overhauling of the tax systems along with introduction of wide ranging reforms like
broadening of tax base, introduction of VAT and progressive taxes, curtailing the discretionary powers of the tax officials, strengthening of public administrations, controlling tax avoidance, withdrawal of harmful subsidies and abolishment of tax exemptions will certainly help in designing and formulating such a mechanism. In addition, ability to pay should be the taxation base and rich individuals as well as big landowners should be taxed accordingly.

Secondly, the negative relationship between public expenditure and economic growth is really a matter of concern for the policy makers. However, despite its negative effect on economic growth it is less costly to finance public expenditure through taxes. After tax, bonds should be floated to finance expenditure. Seigniorage should be used as a last resort for the financing of public expenditure. The deficits should be bridged by decreasing government sizes and increasing tax to GDP ratio. Therefore, the role of governments needs to be redefined in such a way that it becomes pro growth. The efficiency of the public sectors can be a key to achieve this object. Good governance can help achieve efficiency. Furthermore, increase in the share of development expenditure in total expenditure can be useful and in turn can enhance economic development.

Thirdly, negative effect of defense expenditure on growth is also worrisome. It has slowed down the economic development of the region as it eats up a bulk of scarce resources every year. However, it is indispensable in the current geo-political scenario of the region. Defense expenditure has shrunk the fiscal space and left policy makers with little resources to address highly important issues like physical and human capital. Succinctly speaking unless and until these countries reduce the non development expenditure especially on defense the goal of economic development cannot be achieved. However, the defense expenditure can only be
decreased if the internal and external disputes of the countries are politically resolved. This necessitates the continuity of dialogue across the borders which further depend on much diplomatic work, good will, political vision on the part of the Indian and Pakistani leadership.

Fourthly, it is suggested that government size, measured as a share of GDP, need to be decreased as it is above the estimated optimal level and have affected growth negatively over the years. On the other hand, increase in tax collection can pay economic dividends as it is below the estimated growth maximizing tax rate. This policy will help governments to overcome the resource crunch prevailing in these economies. The scope to reduce public expenditure is small while substantial increase in taxes is possible due to low tax to GDP ratio in these countries. However, axe should fall on non developmental expenditure despite its downward rigidity keeping the development expenditure constant. Fiscal tightening through cuts in public spending, restructuring and reorganization of the present tax systems and effective fiscal policy aiming on specific economic and social goals is suggested to address the major economic concerns of the region. Restructuring of the tax regime may include widening of tax base, proper documentation of the economy, less tax rebates and subsidies, simplification of tax laws and eradication of the corruption from tax systems. For the moment, these economies have no alternate except the fiscal tightening and more resource mobilization from domestic sources.

Fifthly, it is suggested that tight monetary policy can help enhance growth by limiting the excessive borrowing of the governments from the central banks. It can be achieved by giving more autonomy to the central banks that will restrict the politicization of seigniorage.
The appointments of the central bank governors should be transparent, fair and above political consideration along with assurance of the completion of their tenures.

Finally, the study makes strong argument for a combination of tight fiscal policy along with stringent monetary policy to address number of socio-economic issues that are the major concerns of this region. The functioning of monetary and fiscal policies in isolation cannot be as effective as their combination. Tight fiscal policy seems less effective if monetary authorities show leniency towards printing of money. Soft monetary policy may cancel out the beneficial effects of tight fiscal discipline.

7.3- Future Research Directions:

Public expenditure growth nexus is a complex and highly controversial issue that demands for a rigorous and cumbersome analysis. To address all issues regarding data, methodology, econometric techniques and definition of variables in one study seems extremely difficult. Although we tried our best to plug loopholes of the previous studies yet it cannot be said that this is the final study on the issue. However, it has opened some new areas on which future research can be carried out.

Firstly, the present study only concentrated on the economic issues as determinants of growth in public expenditure over the years in Pakistan, India, Sri Lanka and Nepal. However, non economic issues like political and bureaucratic pressures, ideological commitments and geographical differences are not less important. The indexation and inclusion of these variables into regression analysis can be more informative. These variables have become more important
due to current geo-political importance of the region. Thus, future research needs to consider these variables while analyzing the expenditure-growth nexus.

Secondly, length of the data in a time series analysis is directly related to robustness of the results. At the same time, to get long time series data in case of developing countries is always difficult. The results obtained from using small span of data may be overturned in future when the analysis is done with long time series data. Therefore, the analysis is suggested with maximum possible time series data to have more reliable and robust results.

Thirdly, future research may focus to measure the gains that can be made by reducing the size of government to the optimal level and by increasing the tax rate to the threshold level by simulation method. In addition, the dead weight loss can be measured for the years in which government size remained beyond the optimal level. Further, finding the optimal level of different categories of public expenditure such as defense, education and health can also be an interesting topic for researchers.

Lastly, new research can be carried out by further delineating the budget constraint. Government borrowing can be divided into domestic and foreign borrowing respectively that will show whether it is better to finance fiscal deficit by domestic or foreign borrowing.


Appendixes

Appendix I:

Table A-1
The Critical Values of the Augmented Dickey Fuller Unit Root Test

<table>
<thead>
<tr>
<th></th>
<th>CONSTANT</th>
<th>CONSTANT &amp; TREND</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>-3.6463</td>
<td>-4.2627</td>
</tr>
<tr>
<td>5%</td>
<td>-2.9540</td>
<td>-3.5530</td>
</tr>
<tr>
<td>10%</td>
<td>-2.6158</td>
<td>-3.2096</td>
</tr>
</tbody>
</table>
### Appendix II:

**Table A-2**


|-------|---------|---------|----------------|-----------|
|       | Pakistan | • Expansionary fiscal policy  
• Widening of fiscal deficits.  
• Large government sector  
• Increase in defense expenditure | • Increase in public expenditure.  
• Relatively high level of development expenditure  
• High fiscal deficit.  
• Credit controls and interest ceiling were imposed.  
• High defense expenditure | • Implementation of various Structural and stabilization Programmes of the IMF and the World Bank.  
• Withdrawal of subsidies as part of fiscal adjustment.  
• Focus on containing fiscal deficits and indebtedness and to curb the cost of debt servicing.  
• Debt reduction strategy Limitation (FRDL) Act 2005 |
|       | India | • Conservative fiscal-monetary stance.  
• Cut in expenditure and rise in taxes. | • Expansionary fiscal policy  
• High fiscal deficits.  
• Increase in defense expenditure. | • Major economic reforms.  
• Focus on curtailing fiscal deficits and debt.  
• Tax reforms; Broadening of tax base. Plugging of loopholes to increase tax revenue. |
|       | Sri Lanka | • Contractionary fiscal policies  
• High levels of development expenditure.  
• Low level of defense expenditure | • Massive budget deficits to support investment, development expenditure and defense expenditure. | • Strengthening the independence and capacity of central bank.  
• Reduction in budget deficit and debt. |
|       | Nepal | • Restricted fiscal policy.  
• Low fiscal deficits. | • Expansionary fiscal policy.  
• Focus on development expenditure.  
• Reforms in 1985/86  
• Focus on curbing fiscal deficit and public debt. | • Reforms in 1990.  
• Focus on broadening tax base and improving revenue administration.  
• Adoption of Prudent fiscal policy  
• Curtailment of fiscal deficit and debt.  
• Imposition of VAT. |
### Table A-3


|---------------|---------|---------|-----------|
| **Pakistan**  | • Devaluation of rupee  
• Replacement of export bonus voucher by free and titled list of imports.  
• Removal of export duties.  
• Introduction of compensatory rebate schemes. | • Liberalizing reforms.  
• Simplification of export/import license procedure.  
• Replacement of quantitative restrictions by tariffs.  
• Introduction and withdrawal of compensatory rebates on manufactured goods. | • Removal of licensing requirements for importable goods.  
• Improvement in port facilities.  
• Removal of quantitative restrictions.  
• Export processing zones in Karachi and Lahore. |
| **1970s**     | • Closed economy.  
• Protectionist policy  
• Hefty tariffs and non tariffs barriers.  
• Pervasive imports restrictions. | • Systematic shifts toward more open economy.  
• Greater reliance on market forces.  
• Encouragement of the private sector. | • Major reforms in 1990  
• Flexible exchange rate regime.  
• Liberalization of FDI  
• Imports quotas were removed. |
| **India**     | • Strictly closed economy  
• All imports under licensing  
• Duty rebate for imported inputs of exporters  
• Setting up of institutional facilities for exporters.  
• Excessive reliance on import substituting industrialization. | • Open economy  
• Moving away from import substitution policies.  
• Introduction of a wide range of trade liberalization measures.  
• Tariff structure simplification  
• Export licensing and export duties were gradually removed.  
• Tax and duty concession for exporters  
• Generous incentives for FDI.  
• Particular focus on diversification of trade.  
• Encouragement of small and medium scale exporters through incentives  
• Removal of administrative controls.  
• Reduction in food subsides. | • Privatization of public sector firms.  
• Abolition of investment licensing regimes.  
• Streamlining of customs procedures for exporters.  
• Reversal of major liberal trade policies.  
• Deliberate move back to import-substitution protectionism. |
| **1970-1976** | • Strictly closed economy  
• All imports under licensing  
• Duty rebate for imported inputs of exporters  
• Setting up of institutional facilities for exporters.  
• Excessive reliance on import substituting industrialization. | • Open economy  
• Moving away from import substitution policies.  
• Introduction of a wide range of trade liberalization measures.  
• Tariff structure simplification  
• Export licensing and export duties were gradually removed.  
• Tax and duty concession for exporters  
• Generous incentives for FDI.  
• Particular focus on diversification of trade.  
• Encouragement of small and medium scale exporters through incentives  
• Removal of administrative controls.  
• Reduction in food subsides. | • Privatization of public sector firms.  
• Abolition of investment licensing regimes.  
• Streamlining of customs procedures for exporters.  
• Reversal of major liberal trade policies.  
• Deliberate move back to import-substitution protectionism. |
| **1977-1990** | • Strictly closed economy  
• All imports under licensing  
• Duty rebate for imported inputs of exporters  
• Setting up of institutional facilities for exporters.  
• Excessive reliance on import substituting industrialization. | • Open economy  
• Moving away from import substitution policies.  
• Introduction of a wide range of trade liberalization measures.  
• Tariff structure simplification  
• Export licensing and export duties were gradually removed.  
• Tax and duty concession for exporters  
• Generous incentives for FDI.  
• Particular focus on diversification of trade.  
• Encouragement of small and medium scale exporters through incentives  
• Removal of administrative controls.  
• Reduction in food subsides. | • Privatization of public sector firms.  
• Abolition of investment licensing regimes.  
• Streamlining of customs procedures for exporters.  
• Reversal of major liberal trade policies.  
• Deliberate move back to import-substitution protectionism. |
| **Sri Lanka** | • Strictly closed economy  
• All imports under licensing  
• Duty rebate for imported inputs of exporters  
• Setting up of institutional facilities for exporters.  
• Excessive reliance on import substituting industrialization. | • Open economy  
• Moving away from import substitution policies.  
• Introduction of a wide range of trade liberalization measures.  
• Tariff structure simplification  
• Export licensing and export duties were gradually removed.  
• Tax and duty concession for exporters  
• Generous incentives for FDI.  
• Particular focus on diversification of trade.  
• Encouragement of small and medium scale exporters through incentives  
• Removal of administrative controls.  
• Reduction in food subsides. | • Privatization of public sector firms.  
• Abolition of investment licensing regimes.  
• Streamlining of customs procedures for exporters.  
• Reversal of major liberal trade policies.  
• Deliberate move back to import-substitution protectionism. |
Nepal

- Gradual move towards liberalization of trade.
- Cash subsidy programmes.
- Duty exemption on exports.
- Simplification of licensing and customs procedure.
- Liberalization of trade
- Retreat from the “licence raj”
- Introduction of more thorough market based reforms.
- Relaxation of FDI
- Removal of NTB’s
- Drastic cuts in Tariffs.
- Permitting hundred per cent foreign ownership in many sectors

<table>
<thead>
<tr>
<th>Years</th>
<th>1970-2002</th>
<th>2002-2008</th>
</tr>
</thead>
</table>
| Country
| To Curb jobless growth |
| Increase in workers shares in company’s profits from 2% to 4% and then to 5%.
| Procedure to redress workers individual grievances.
| Settlement of disputes through Work Councils.
| Establishment of Workers Children Education Cess.
| Statement of reasons for termination of the service of a workman.
| Provision of statutory bonus up to one month’s pay in the event of profit.
| Introduction of old age benefits scheme, group insurance scheme and group incentives scheme for workers.
| Effective safety measures at workplaces.
| Combating child and bonded labor.
| Provision of decent work
| Policy formulation for peaceful resolution of conflicts disputes.
| Elimination of gender discrimination to reinforce gender equality for working women.
| Consolidation/simplification of labor laws.
| Easy access to speedy justice in the labor sector.
| Promotion of employee social security and social insurance programs.
| Improvement of labor welfare institutions namely; Workers Welfare Fund, EOBI and ESSIs.
| Increase in minimum pay

|-----------|-------|-----------|
| India
| Public sector involvement increased to protect employment in relatively backward areas.
| Encouragement of labor intensive industries-textile, leather, wood products.
| Improve quality of jobs.
| Creation of jobs in more organized sectors.
| Focus on self employment.
| Transferring labor from low productive sectors to high productive
| Creation of large scale self employment.
| Creation of conducive atmosphere for sustainable wage employment.
| To encourage and facilitate training of young entrepreneurs on development of small scale and cottage
• Provision of demand oriented skills to the workers.
• Tackling child labor.

• Arrangement of easy credits for unemployed.

• To formulate area and trade specific strategies for maximizing employment opportunities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initiation of special employment programs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Skill development without gender discrimination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Highest priority to irrigation and transport sectors for employment generation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provision of low cost credits to small and medium size industries.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Easy availability of credits to employment oriented sectors.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Initiation of training schemes to upgrade workers' skills.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Promotion of job opportunities for women and men to obtain productive work in conditions of freedom, equity, security and human dignity.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rights to be protected according to ILO declaration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Gender sensitive social protection; health, old age benefits.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• More rights to the migrants.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Introduction of skill oriented courses at university level.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Revision of lending Policies of the banks in favor of the MSE sector.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Formation of workers facilitation centres.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Emphasis on vocational education like other countries of the region.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Duty draw backs and tax exemption to encourage employment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• High focus on tourism that can absorb much unemployment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Expansion of training tourism personnel at different levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Minimum annual pay rise for permanent workers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>• Stress on import substitution industries.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Industrial licensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Regime change, socialist agenda</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Nationalization of institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Anti-private enterprise policies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• High expenditure on mega projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Softening the grip of investment licensing system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Encouragement of private sector to venture in the areas that were reserved for public sector.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Initiation of attractive packages to attract FDI</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Initiative of privatization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Public private partnership</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table A-5
<table>
<thead>
<tr>
<th>Country</th>
<th>1970s,80s</th>
<th>1990-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>• Encouragement of Import substitution industries.</td>
<td>• Allowing companies more freedom.</td>
</tr>
<tr>
<td></td>
<td>• Marked expansion of public role in industry.</td>
<td>• Dramatic change in industrial policy.</td>
</tr>
<tr>
<td></td>
<td>• Multiple controls on private investment.</td>
<td>• Dismantling of government control over industries.</td>
</tr>
<tr>
<td></td>
<td>• Permit raj</td>
<td>• Industrial licensing by the central government has been almost abolished.</td>
</tr>
<tr>
<td></td>
<td>• Restricted private sector.</td>
<td>• Massive public investment in irrigation <em>(Mahaweli Development Project)</em> and housing projects.</td>
</tr>
<tr>
<td></td>
<td>• More emphasis on attracting FDI</td>
<td>• Improvement of tourism to enhance employment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Softening of severe controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Focus on small and medium size enterprises.</td>
</tr>
<tr>
<td>Nepal</td>
<td><strong>1970s,80s</strong></td>
<td><strong>1990-2000</strong></td>
</tr>
<tr>
<td></td>
<td>• Active industrial policy</td>
<td>• Structural changes to encourage private sector.</td>
</tr>
<tr>
<td></td>
<td>• Direct involvement of the government in the economy</td>
<td>• Formulation of liberal Industrial Policy in 1992.</td>
</tr>
<tr>
<td></td>
<td>• Huge investment in public enterprises.</td>
<td>• Curtailment of government role.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promotion of labor incentives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Further liberalization of industrial policy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• More ambitious Privatization programmes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Encouragement of FDI to increase industrial production.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Emphasis on market driven strategies.</td>
</tr>
</tbody>
</table>
### Appendix III:

#### Table A-6

**Description of Variables with Their Source**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita GDP</td>
<td>World Development Indicator</td>
</tr>
<tr>
<td>Per capita GDP growth rate</td>
<td>World Development Indicator</td>
</tr>
<tr>
<td>Openness (Imports + Export)</td>
<td>World Development Indicator</td>
</tr>
<tr>
<td>Population growth</td>
<td>World Development Indicator</td>
</tr>
<tr>
<td>Gross Fixed Capital Formation</td>
<td>World Development Indicator</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>Government Finance Statistics</td>
</tr>
<tr>
<td>Tax Revenue</td>
<td>Government Finance Statistics</td>
</tr>
<tr>
<td>Deficit</td>
<td>Calculated</td>
</tr>
<tr>
<td>Seigniorage</td>
<td>Calculated</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>Government Finance Statistics</td>
</tr>
<tr>
<td>Defense Expenditure</td>
<td>Government Finance Statistics</td>
</tr>
<tr>
<td>Public Education Expenditure</td>
<td>Government Finance Statistics</td>
</tr>
<tr>
<td>Public Health Expenditure</td>
<td>Government Finance Statistics</td>
</tr>
<tr>
<td>Other Expenditure</td>
<td>Calculated</td>
</tr>
<tr>
<td>Reserve Money</td>
<td>International Finance Statistics</td>
</tr>
<tr>
<td>Consumer Price Index (CPI)</td>
<td>World Development Indicators</td>
</tr>
</tbody>
</table>
Appendix IV: Panel Estimation Using OLS

Table A-7
Results with Aggregated Public Expenditure Using OLS
Per capita GDP growth is the dependent variables

<table>
<thead>
<tr>
<th></th>
<th>Tax Finance</th>
<th>Debt Finance</th>
<th>Money Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.649</td>
<td>-0.744</td>
<td>-0.769</td>
</tr>
<tr>
<td></td>
<td>[-0.27]</td>
<td>[-0.32]</td>
<td>[-0.32]</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>-0.069</td>
<td>-0.303*</td>
<td>0.084</td>
</tr>
<tr>
<td></td>
<td>[-0.95]</td>
<td>[-3.18]</td>
<td>[0.35]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.005</td>
<td>0.006</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>[0.33]</td>
<td>[0.35]</td>
<td>[0.32]</td>
</tr>
<tr>
<td>Population</td>
<td>-0.205</td>
<td>-0.194</td>
<td>-0.161</td>
</tr>
<tr>
<td></td>
<td>[-0.35]</td>
<td>[-0.33]</td>
<td>[-0.28]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.167*</td>
<td>0.168*</td>
<td>0.170</td>
</tr>
<tr>
<td></td>
<td>[2.79]</td>
<td>[2.81]</td>
<td>[2.84]</td>
</tr>
<tr>
<td>R-square</td>
<td>0.177</td>
<td>0.181</td>
<td>0.171</td>
</tr>
<tr>
<td>F-test</td>
<td>4.64</td>
<td>4.74</td>
<td>4.63</td>
</tr>
</tbody>
</table>

Note: *mean significantly different from zero (two tailed test) at 1% level. T. statistics are in parenthesis.
Appendix V:

Table A-8

Measures of Seigniorage

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monetary base (Or high-powered money)</td>
<td>Reserve money (line 14 in IFS)</td>
</tr>
<tr>
<td>Seigniorage 1:</td>
<td>Ratio of the change in high powered money to nominal GDP (Fischer 1982)</td>
</tr>
<tr>
<td>Seigniorage 2:</td>
<td>Ratio of high-powered money to nominal GDP in current period minus ratio of high-powered money to nominal GDP in last period plus the product of the ratio of high-powered money to nominal GDP in last period times the growth rate of nominal GDP in current period to one plus the growth rate of GDP in current period (Walsh 1998)</td>
</tr>
<tr>
<td>Seigniorage 3:</td>
<td>Ratio of the product of the inflation rate times high-powered money to the product of one plus the inflation rate times nominal GDP (De Haan, Zelhorst and Roukens 1993, Walsh 1998).</td>
</tr>
</tbody>
</table>

Reproduced from Bose, Holman and Neanidis (2005)
Appendix VI:

**Calculation of F statistics**

\[
F = \frac{\frac{(R^2_{UR} - R^2_R)}{m}}{\frac{(1 - R^2_{UR})}{(n - k)}}
\]

Where \( R^2_{UR} \) is the \( R^2 \) value obtained from unrestricted regression and \( R^2_R \) is the \( R^2 \) value obtained from restricted regression. \( m \) and \( k \) are, respectively, the number of linear restrictions in the restricted (OLS) regression and number of parameters in the unrestricted (FEM) model. \( n \) is the number of observations.

\[
= \frac{(0.478 - 0.179)/3}{(1-0.478)/(136-8)} = 24.43
\]

The calculated F-value for 3 numerator degree of freedom and 128 denominator degree of freedom is highly significant. Therefore, the restricted model (OLS) seems to be invalid.
Appendix VII: Time Series Estimation

Table A-9

Results with Aggregated Public Expenditure (OLS), Pakistan
Per Capita GDP Growth is the Dependent Variable

<table>
<thead>
<tr>
<th></th>
<th>Tax Finance</th>
<th>Debt Finance</th>
<th>Money Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-22.04*</td>
<td>-22.21*</td>
<td>-22.05*</td>
</tr>
<tr>
<td></td>
<td>[-3.23]</td>
<td>[-3.22]</td>
<td>[-3.26]</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>0.254</td>
<td>-0.819*</td>
<td>-1.111*</td>
</tr>
<tr>
<td></td>
<td>[1.13]</td>
<td>[-4.16]</td>
<td>[-2.97]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.125</td>
<td>0.126</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td>[0.87]</td>
<td>[0.88]</td>
<td>[0.88]</td>
</tr>
<tr>
<td>Population</td>
<td>5.86*</td>
<td>0.5.80*</td>
<td>5.87*</td>
</tr>
<tr>
<td></td>
<td>[3.51]</td>
<td>[3.50]</td>
<td>[3.53]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.406**</td>
<td>0.404**</td>
<td>0.401**</td>
</tr>
<tr>
<td></td>
<td>[2.19]</td>
<td>[2.17]</td>
<td>[2.20]</td>
</tr>
<tr>
<td>R-square</td>
<td>0.459</td>
<td>0.458</td>
<td>0.456</td>
</tr>
<tr>
<td>F-test</td>
<td>3.82</td>
<td>3.83</td>
<td>3.82</td>
</tr>
</tbody>
</table>

Note: *, ** mean significantly different from zero (two tailed test) at 1%, and 5% level respectively. T. statistics are in parenthesis.
Table A-10

Results with Aggregated Public Expenditure (OLS), India

Per Capita GDP Growth is the Dependent Variable

<table>
<thead>
<tr>
<th></th>
<th>Tax Finance</th>
<th>Debt Finance</th>
<th>Money Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>15.221</td>
<td>15.212</td>
<td>15.220</td>
</tr>
<tr>
<td></td>
<td>[0.96]</td>
<td>[0.96]</td>
<td>[0.96]</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>-1.386</td>
<td>-0.404</td>
<td>-0.016</td>
</tr>
<tr>
<td></td>
<td>[-1.38]</td>
<td>[-0.83]</td>
<td>[-0.02]</td>
</tr>
<tr>
<td>Openness</td>
<td>-0.182</td>
<td>0.181</td>
<td>-0.182</td>
</tr>
<tr>
<td></td>
<td>[-0.87]</td>
<td>[0.87]</td>
<td>[-0.87]</td>
</tr>
<tr>
<td>Population</td>
<td>-2.190</td>
<td>-2.920</td>
<td>-2.210</td>
</tr>
<tr>
<td></td>
<td>[-0.45]</td>
<td>[-0.46]</td>
<td>[-0.48]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.634</td>
<td>0.635</td>
<td>0.632</td>
</tr>
<tr>
<td></td>
<td>[1.39]</td>
<td>[1.38]</td>
<td>[1.43]</td>
</tr>
<tr>
<td>R-square</td>
<td>0.271</td>
<td>0.270</td>
<td>0.271</td>
</tr>
<tr>
<td>F-test</td>
<td>1.67</td>
<td>1.66</td>
<td>1.68</td>
</tr>
</tbody>
</table>
# Table A-11

**Results with Aggregated Public Expenditure (OLS), Sri Lanka**

Per Capita GDP Growth is the Dependent Variable

<table>
<thead>
<tr>
<th></th>
<th>Tax Finance</th>
<th>Debt Finance</th>
<th>Money Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>4.558</td>
<td>4.565</td>
<td>4.551</td>
</tr>
<tr>
<td></td>
<td>[0.91]</td>
<td>[0.90]</td>
<td>[0.93]</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>-0.041</td>
<td>-0.588*</td>
<td>-0.604</td>
</tr>
<tr>
<td></td>
<td>[-0.32]</td>
<td>[-3.78]</td>
<td>[-1.27]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.015</td>
<td>0.014</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>[0.30]</td>
<td>[0.30]</td>
<td>[0.31]</td>
</tr>
<tr>
<td>Population</td>
<td>0.671</td>
<td>0.672</td>
<td>0.670</td>
</tr>
<tr>
<td></td>
<td>[0.51]</td>
<td>[0.50]</td>
<td>[0.58]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.117</td>
<td>0.118</td>
<td>0.117</td>
</tr>
<tr>
<td></td>
<td>[0.99]</td>
<td>[0.99]</td>
<td>[0.99]</td>
</tr>
<tr>
<td>R-square</td>
<td>0.48</td>
<td>0.49</td>
<td>0.48</td>
</tr>
<tr>
<td>F-test</td>
<td>4.31</td>
<td>4.30</td>
<td>4.36</td>
</tr>
</tbody>
</table>

**Note:** *mean significantly different from zero (two tailed test) at 1% level. T. statistics are in parenthesis.*
Table A-12

Results with Aggregated Public Expenditure (OLS), Nepal
Per Capita GDP Growth is the Dependent Variable

<table>
<thead>
<tr>
<th></th>
<th>Tax Finance</th>
<th>Debt Finance</th>
<th>Money Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.627</td>
<td>0.625</td>
<td>0.623</td>
</tr>
<tr>
<td></td>
<td>[0.05]</td>
<td>[0.05]</td>
<td>[0.06]</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>-0.088</td>
<td>-0.081</td>
<td>0.580</td>
</tr>
<tr>
<td></td>
<td>[-0.14]</td>
<td>[-0.24]</td>
<td>[0.86]</td>
</tr>
<tr>
<td>Openness</td>
<td>0.038</td>
<td>0.039</td>
<td>0.038</td>
</tr>
<tr>
<td></td>
<td>[0.44]</td>
<td>[0.45]</td>
<td>[0.44]</td>
</tr>
<tr>
<td>Population</td>
<td>-0.350</td>
<td>-0.353</td>
<td>-0.352</td>
</tr>
<tr>
<td></td>
<td>[-0.08]</td>
<td>[-0.08]</td>
<td>[-0.08]</td>
</tr>
<tr>
<td>Investment</td>
<td>0.044</td>
<td>0.033</td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td>[0.08]</td>
<td>[0.08]</td>
<td>[0.07]</td>
</tr>
<tr>
<td>R-square</td>
<td>0.08</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>F-test</td>
<td>0.31</td>
<td>0.32</td>
<td>0.31</td>
</tr>
</tbody>
</table>
## Appendix VIII:

### Table A-13

**Selected Diagnostic Test Results of the Model (Pakistan)**

<table>
<thead>
<tr>
<th>Test</th>
<th>Null hypothesis</th>
<th>P-value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramsey RESET F Test</td>
<td>Model is stable with no specification error</td>
<td>0.314</td>
<td>Can not reject null hypothesis and conclude that model is stable with no specification error</td>
</tr>
<tr>
<td>Normality test (Jarque-Bera)</td>
<td>Residual are normally distributed</td>
<td>0.171</td>
<td>Null hypothesis cannot be rejected and conclude that residuals are normally distributed</td>
</tr>
<tr>
<td>Breusch-Godfrey LM F Statistics</td>
<td>No serial correlation in the residuals up to the 2nd order</td>
<td>0.186</td>
<td>Can not reject null hypothesis and conclude residuals are not correlated up to 2nd order</td>
</tr>
<tr>
<td>ARCH F Test</td>
<td>No auto regressive conditional hetroskedasticity up to the 1st order</td>
<td>0.692</td>
<td>Null hypothesis cannot be rejected. Hence there is no auto regressive conditional hetroskedasticity up to the 1st order.</td>
</tr>
</tbody>
</table>

### Table A-14

**Selected Diagnostic Test Results of the Model (India)**

<table>
<thead>
<tr>
<th>Test</th>
<th>Null hypothesis</th>
<th>P-value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramsey RESET F Test</td>
<td>Model is stable with no specification error</td>
<td>0.235</td>
<td>Can not reject null hypothesis and conclude that model is stable with no specification error</td>
</tr>
<tr>
<td>Normality test (Jarque-Bera)</td>
<td>Residual are normally distributed</td>
<td>0.253</td>
<td>Null hypothesis cannot be rejected and conclude that residuals are normally distributed</td>
</tr>
<tr>
<td>Breusch-Godfrey LM F Statistics</td>
<td>No serial correlation in the residuals up to the 2nd order</td>
<td>0.501</td>
<td>Can not reject null hypothesis and conclude residuals are not correlated up to 2nd order</td>
</tr>
<tr>
<td>ARCH F Test</td>
<td>No auto regressive conditional hetroskedasticity up to the 1st order</td>
<td>0.182</td>
<td>Null hypothesis cannot be rejected. Hence there is no auto regressive conditional hetroskedasticity up to the 1st order.</td>
</tr>
</tbody>
</table>
### Table A-15

**Selected Diagnostic Test Results of the Model (Sri Lanka)**

<table>
<thead>
<tr>
<th>Test</th>
<th>Null hypothesis</th>
<th>P-value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramsey RESET F Test</td>
<td>Model is stable with no specification error</td>
<td>0.851</td>
<td>Can not reject null hypothesis and conclude that model is stable with no specification error</td>
</tr>
<tr>
<td>Normality test (Jarque- Bera)</td>
<td>Residual are normally distributed</td>
<td>0.535</td>
<td>Null hypothesis cannot be rejected and conclude that residuals are normally distributed</td>
</tr>
<tr>
<td>Breusch-Godfrey LM F Statistics</td>
<td>No serial correlation in the residuals up to the 2nd order</td>
<td>0.579</td>
<td>Can not reject null hypothesis and conclude residuals are not correlated up to 2nd order</td>
</tr>
<tr>
<td>ARCH F Test</td>
<td>No auto regressive conditional heterskedasticity up to the 1st order</td>
<td>0.473</td>
<td>Null hypothesis cannot be rejected. Hence there is no auto regressive conditional heterskedasticity up to the 1st order</td>
</tr>
</tbody>
</table>

### Table A-16

**Selected Diagnostic Test Results of the Model (Nepal)**

<table>
<thead>
<tr>
<th>Test</th>
<th>Null hypothesis</th>
<th>P-value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramsey RESET F Test</td>
<td>Model is stable with no specification error</td>
<td>0.563</td>
<td>Can not reject null hypothesis and conclude that model is stable with no specification error</td>
</tr>
<tr>
<td>Normality test (Jarque- Bera)</td>
<td>Residual are normally distributed</td>
<td>0.657</td>
<td>Null hypothesis cannot be rejected and conclude that residuals are normally distributed</td>
</tr>
<tr>
<td>Breusch-Godfrey LM F Statistics</td>
<td>No serial correlation in the residuals up to the 2nd order</td>
<td>0.491</td>
<td>Can not reject null hypothesis and conclude residuals are not correlated up to 2nd order</td>
</tr>
<tr>
<td>ARCH F Test</td>
<td>No auto regressive conditional heterskedasticity up to the 1st order</td>
<td>0.158</td>
<td>Null hypothesis cannot be rejected. Hence there is no auto regressive conditional heterskedasticity up to the 1st order</td>
</tr>
</tbody>
</table>
Derivation of Equation 6.7

\[ \ln Y = \ln A + \alpha \ln(\tau) + \beta \ln(\theta) + \gamma \ln(1 - \tau - \theta) \] \hspace{1cm} (A.1)

Differentiating equation with respect to \( \tau \) and setting equal to zero;

\[ \frac{\partial \ln Y}{\partial \tau} = \frac{\alpha}{\tau} - \frac{\gamma}{1 - \tau - \theta} = 0 \] \hspace{1cm} (A.2)

Rearranging terms;

\[ \frac{\alpha}{\tau} = \frac{\gamma}{1 - \tau - \theta} \]

\[ \alpha - \alpha \tau - \alpha \theta = \gamma \tau \]

\[ \alpha \tau + \gamma \tau = \alpha - \alpha \theta \]

\[ \tau (\alpha + \gamma) = \alpha (1 - \theta) \]

\[ \tau^* = \frac{\alpha (1 - \theta)}{\alpha + \gamma} \] \hspace{1cm} (A.3)