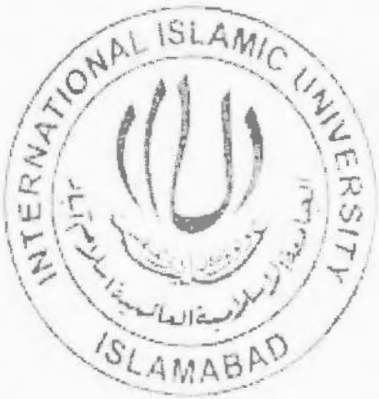
Structural Determinants of Budget Deficit in Pakistan



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Budget deficits - Pakistan

Government revenues

Debt service

Inflation

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Declaration

I hereby declare that this thesis, neither as a whole nor in part thereof, has been copied out from any other source. It is further declared that I have carried out this research by myself and have completed this thesis on the basis of my personal efforts under the guidance and help of my supervisors. Likewise, no portion of the work presented in this volume has been submitted to any educational institution or academy of learning for the award of any degree or qualification thereof. If any part of this thesis is proven to be copied out, or the work is proven to have been submitted to any degree awarding institution, I shall be held responsible for the consequences.

Mahwish Saeed

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List of Abbreviations

GARCH	Generalized Autoregressive Conditional Heteroscedasticity
GDP	Gross Domestic Product
GMM	Generalized Method of Moment
LDCs	Less Developed Countries
IFIs	International Financial Institution
OLS	Ordinary Least Square
SAP	Structural Adjustment Program
WDI	World Development Indicator
FRDL	Fiscal Responsibility and Debt Limitation

Acknowledgement

First and foremost praises and thanks to the Allah, the Almighty, for His showers of blessings throughout my research work to complete it successfully. I express my deep respect to Prophet Muhammad (PBUH) who is the city of knowledge and source of inspirations.

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My sincere thanks are also due to my co-supervisor Dr. Hafiz Muhammad Yasin, Associate professor at and who guided me in all stages of research and writing of this thesis. Without his precious support, it would not have been possible to conduct this research.

I am extremely grateful for what he has offered me. I am extremely grateful to my mother for their love, prayers, caring and sacrifices for educating and preparing me for my future and supporting me spiritually throughout my life. I would also like to thank my parents for their wise counsel and sympathetic ear. You are always there for me.

Last but not the least, I am grateful to my husband, sisters, brothers, and all my friends for their support and valuable prayers. Finally, my thanks go to all the people who have supported me to complete the research work directly or indirectly.

Thank you very much, everyone!

Abdul Wahid Saeed

Abstract

The main objective of this study is to examine the structural determinants of budget deficit in Pakistan. To accomplish the objectives this study uses annual time series data from 1972-2014. The GMM technique is used to evaluate the determinants of budget deficit. The results reveal that growth of government revenues and level of economic development has positive and significant impact on budget deficit. The results also indicate government size on the extent of government participation in the economy and poor control exercised by the government on expenditures lead to higher budget deficit. Instability of government revenues and expenditures are also responsible for higher budget deficit. The impact of different political regimes on budget deficit seems to be insignificant in case of Pakistan. Likewise the volume of debt servicing and inflation has positive and significant impacts while trade openness has insignificant impact on budget deficit. There is need to focus on these structural factors seriously in order to get rid of persistent problem of budget deficit.

Chapter 1

Introduction

1.1 The Backdrop

Preparing and implementing fiscal budget is an important part of economic planning of a country. Budget is used as an instrument for economic policy making. The first principle of public finance is that public expenditure should be fulfilled by public revenues at large. This rule is accepted by almost all international agencies and all countries, developed as well as developing. However, this rule does not appear to be feasible in most of developing countries. This is because the governments have to fulfill the ever-increasing demand for provision of public goods and to achieve the objectives of macroeconomic stability, economic growth and development. On the other hand, the sources of revenues are not only scarce but also unreliable. Budget deficit is therefore an important feature of fiscal policy in these countries.

Budget is in deficit when expenditures exceed revenues. In this case government has to put more money in the system than it collects from taxes. This extra money is obtained through borrowing from the domestic private sector or from the central bank or from external sources. The government expects that additional money put into the economic activity would generate additional revenues in future that will cover the gap. The excess money that the government injects this way into the economy is known as deficit financing. Budget deficit is defined as the difference between government expenditures (expenditures on goods and services, transfer payments and debt service payments) and revenues (both tax and non-tax revenues).

There is no single way for measurement of budget deficit. There are a number of measurements of budget deficit and each measurement is applicable to specific conditions. There are different conceptual and practical issues in measurement of budget deficit (Agenor and Montiel. 2008). It is argued that budget deficit would be conventionally measured on both cash or accrued basis. In cash basis. budget deficit is the gap between total expenditures based on cash flows and total revenue receipt. In accrual basis, budget deficit is based on accrued revenues and expenditures regardless of whether they include cash payment or not. Budget deficit calculated on accrued basis often exceeds that measured on cash basis.

Government needs resources to finance its development and non-development expenditures. It receives revenues from both tax and non-tax sources. The overall fiscal deficit refers to the gap between all government expenditures and revenues from all sources. Primary deficit refers to the gap between current/non-development expenditures and revenues. The persistence of primary deficit is a real problem. If government fails to collect revenue from taxes and non-tax sources sufficient enough to finance the expenditures. then face persistent fiscal deficit. This is a serious problem indeed. Occasional occurrence of fiscal deficit particularly on capital account or development budget is a normal process and not that serious.

Running huge budget surplus is also not good for the economy as surpluses are the part of revenues obtained from taxes not fully utilized in routine activities and for development purposes. It means excess burden on the general public. So it is plausible for the government to incur deficit occasionally but it should be within a manageable limit.

Economic theory and literature on public finance identifies three alternative ways for financing the fiscal deficit, namely (1) broadening the taxation base and/or enhancing the tax rates (2) internal and external borrowing through floating of bonds and bank borrowing and (3) printing of new money. Inviting donations and getting financial grants and aids is also a minor item in handling deficits.

During the last four decades, Pakistan faces persistent fiscal deficit which is considered as one of the major sources of macroeconomic instability. During 1960's fiscal deficit was only 2.1% of GDP but in 1970's it rose to 8% of GDP .This increase in fiscal deficit was due to 1971 war and separation of East Pakistan. Due to this war defence expenditures increased from 2.7% of GDP in 1965 to 6.7% of GDP in 1974-75. Another reason of increase in fiscal deficit in 1970's was nationalization of banks and industries working earlier in private sector, which increased public expenditure tremendously. The increase in expenditure due to inefficiency of public administration of nationalized industries became a permanent problem for the economy. In 1960's public expenditures were 11.6% of GDP on the average, which rose to 21.5% of GDP in 1970's. During 1980's fiscal deficit reduced to 7.1 % of GDP but this reduction was due to slashing in development expenditures which affected the growth process negatively. During 1990's Pakistan faced severe debt sustainability problem due to which the International Financial Institution (IFI's) forced Pakistan to adopt structural adjustment program (SAP). After adopting SAP, fiscal deficit did reduce to 8.2% of GDP and it continued to reduce such that it reached to only 2.3% of GDP by 2003-04. This reduction was also due to tax structure reform effort in 2000 which increased total revenues a little bit. However fiscal deficit again started increasing and in 2006-07 it reached to 4% of

GDP. to 7% of GDP in 2008-09.and to 8% of GDP in 2013-14. In general. the budget deficit generally remained low during military regimes and high during democratic/civilian regimes.

Although a healthy fiscal performance is based on various economic and structural factors such as the level of economic development. growth of government revenues. extent of government participation in the economy. government control over expenditures. instability of government revenues and expenditures. inflation and debt servicing. If all these factors are not well monitored then these might impact adversely on a country fiscal performance leading to fiscal uncertainty problem.

1.2 Problem Statement

Fiscal Deficit is considered one of the major issues that eventually lead to macro-economic instability. Government can reduce deficit by focusing on structural factors as they are important determinant of budget deficit and resolving the issue. It is therefore worthwhile to examine the impact of structural factors on budget deficit in Pakistan to pinpoint the grey areas and to suggest an optimal policy that should minimize the budget deficit at the margin. Budget deficit is closely associated with accumulation of public debt and debt servicing. Pakistan faces continuously high fiscal deficit and debt problem. The high fiscal deficit leads to an increase in internal and external borrowing which further increases deficit and hence the vicious circle continues. Debt and deficit both are causes and effects of each other. Public debt and debt servicing is not going to be eliminated in the short run so there is a need to reduce fiscal deficit continuously even at slow speed. High budget deficit also increases inflation due to financing through excess

money creation, which again leads to increase budget deficit through reduction in real tax revenues and lags in tax collection process.

1.3 Research Gap

A lot of research work has been done on fiscal deficit in Pakistan. However, many studies in this area (see Hemming, R., Kell, M., & Mahfouz. S. (2002) for instance) have focused mainly on the adverse effects of budget deficit on the economy in terms of different macro-economic indicators like interest rate, employment level, inflation, exchange rate, saving and economic growth. In contrast, our study is based on positive analysis of budget and focuses on the factors determining budget deficit. This avenue is important, since resolution of problem is not possible without identification of its sources. We do not find any significant work on structural determinants of budget deficit in Pakistan. In particular the instability of government revenues and expenditures are also to be considered seriously. Theoretically speaking, government revenues and expenditures should grow smoothly overtime with parallel rates so that the budget remains more or less balanced in the long run. Fluctuations in the short run are natural phenomena. Previous studies do not incorporate these variables as determinants of budget deficit. So this study provides a new direction of research

1.4 Objectives of the Study

Over the past few decades budget deficit has attracted a great deal of attention in developing countries as it is blamed for many ills of the economy such as inflation, economic backwardness, low investment and debt overhang problem. The present study intends to explore the determinants of the budget deficit in Pakistan. The specific objectives of the study are as under:

1. To evaluate the impact of structural factors on fiscal deficit. Focus will be placed on the level of economic development, growth of government revenues, government control over expenditures, extent of government participation in the economy, instability of government revenues and expenditures.
2. To examine the relative impact of military and democratic regimes on budget deficit in Pakistan.

1.5 Rationale and Significance of the Study

Pakistan faces the problem of persistent fiscal deficit and high state of debt since the past four decades. Debt and deficit are the causes and effects of each other. Public debt cannot be vanished in the short run so there is need to reduce fiscal deficit gradually as far as possible. It can be done either to cut down spending or to generate more revenues or both. The first way of reducing fiscal deficit is to increase government revenues through taxation. In Pakistan, the tax to GDP ratio is very low due to many problems in tax structure, which include narrow tax base, wider spread exemptions, low coverage, weak audit and enforcement, administrative inefficiency and tax compliance in term of underreporting and over reporting. On the other hand, political governments are generally not willing to reduce their current expenditures or they are not in a position to do so. Instead they reduce development expenditures, particularly expenditures on health and education. Likewise, the governments always look outwards for assistance and donations to finance development budget instead of relying on own resources. Cutting down development budget may reduce fiscal deficit but will negatively affect the economic growth which in turn may cause higher cyclical deficit (government can get less cyclical deficit as also less tax revenue in recession).

The provision of adequate finance for growth and development programs is the main objective of fiscal policy. Further, IMF imposes limit on budget deficit in FRDL (Fiscal Responsibility and Debt Limitation) act 2016. According to this act Pakistan budget deficit should be 4 % of GDP in fiscal year 2017/18 to fiscal year 2019/20 and 3.5% of GDP afterwards. In this context, it is important to pinpoint the main factors leading to budget deficits during different regimes; democratic or military-led regimes. So, we want to design our study in a manner to highlight the structural factors responsible for persistent budget deficit in Pakistan, which will be helpful in finding ways and means to resolve the issue in the long-run. The ultimate objective is to launch the country on the path of fiscal stability.

1.6 Structure of the Study

This study analyzes the structural factors of budget deficit in Pakistan over the period 1972-2014. Reminder of the study is organized as follows:

Chapter 2 provides theoretical and empirical review in this area. Chapter 3 explains theoretical model, variable description, estimation methodology and sources of data. Chapter 4 provides empirical analysis and discussion of the results. Lastly chapter 5 provides conclusion and policy implications. Bibliographies and references are presented at the end as usual.

Chapter 2

Literature Review

2.1 Introduction

This chapter reviews the existing theoretical and empirical literature on budget deficit. This chapter also elucidates on the existing literature on budget deficit for Pakistan and other developed and developing countries. This review of literature will strengthen the findings of our study. Persistent budget deficit is the common problem of most of the developed and developing countries. The problem of budget deficit is widely analyzed but the importance of structural determinants of budget deficit remains somewhat unexplored especially in Pakistan. Most of the previous researches mainly address the adverse effect of budget deficit on the economy but there is little focus on determinant of budget deficit.

2.2 Budget Deficit and Modes of Financing

Budget deficit occurs when government expenditure exceeds revenues generated from tax and non tax sources. Total deficit or fiscal deficit is the combination of primary deficit plus interest payment of debt. Primary deficit is the difference between current government expenditure and current revenues from tax and non tax sources net of transfer payments.

Keynes (1924) argues that deficit financing should be used to stimulate aggregate demand in times of recession and depressions. It is further argued that deficit financing stimulate economy by increasing business profitability and thereby encouraging private

fixed investment. This accelerator effect further stimulates demand and raises the employment level.

Smith (1776) argues against deficit financing. He argues that household should not run deficits. The author argues that one should get money before one spends and that what is correct for household should also correct for government. The author argues that debt must be repaid as running budget deficit today is burden on future generation.

Budget deficit is financed by three different ways i.e. extra taxation, domestic and foreign borrowing and printing of money.

The first way of financing budget deficit through extra taxation is not an easy method due to strong opposition in the parliament and unrest in general masses. In Pakistan tax rate is already very high therefore; further increase will be economically as well as socially unfair.

The second way of financing budget deficit through borrowing harms the economy in the short and long run. Domestic borrowing has a negative impact on private investment and economic growth and foreign borrowing has a long-run impact in form of debt servicing. Internal borrowing by the government puts pressure on interest rate and crowds out private investment while external borrowing puts pressure on future generations in the form of debt servicing burden. It increases fiscal deficit and compels the government to borrow further, as a result, public debt accumulates over time and debt servicing becomes cumbersome. Debt servicing increases the overall government expenditure and its level of indebtedness. The government has to pay significant part of its revenues as interest payments on debt. If the funds so raised are spent in current/non-

development program, then borrowing does not give any benefit to the economy. The tendency of deficit financing through borrowing is high in developing countries as majority of population, being poor, has to depend mainly on government to provide the basic public goods and services (particularly in health and education sectors, besides infrastructure development) which is economically and politically necessary. Inadequate debt repayment capacity will lead to accumulate debt. Borrowing to finance budget deficit is not sustainable in the long run and results in inflationary situation (Chipeta, 1998). As such, there should be effective tax structure to generate adequate revenues.

The third way of financing budget deficit through printing of money is relatively convenient for the government. Bank borrowing is politically easier but socially very harmful since it is always associated with inflation. This is because an increase in money supply beyond the real demand leads to inflation, which in turn reduces the purchasing power of masses and brings forth hardships for poor and lower-middle income segments of the society. Inflation in the second round reduces the real government revenues and hence further increases budget deficit. Osoro (1997) argues that deficit financing leads to increase the demand for public goods as it reduces the tax prices of public goods and leads to increase spending as well as budget deficit.

2.3 Theoretical Review of Budget Deficit

2.3.1 Tax Smoothing Theory

Barro (1979) developed tax smoothing theory and theoretical rationale for budget deficit. Author argues that temporary shocks in expenditures would be reflected in budget deficits and thus avoids or minimizes distortionary cost of tax rate variations. According

to author, government is a benevolent social planner and maximizes the utility of citizens. Government collects revenues from taxes on labour income for appropriate government spending. In case of economic recessions or wars public debt acts as profit maximizing choice of government representatives. Increase in tax rate will lead to increase the tax burden of tax payer citizens. According to tax smoothing model variations in tax rates are smoothen by public debt and thus minimizes tax burden. Government set tax rate at a level that would minimize the distortionary cost of taxes. According to this model tax rate would not change with present information about spending and output rather it only changes with new information about future. Level of tax rates mainly determined by intertemporal budget constraint in which both present values of expenditures and revenues would remain same. In order to smooth the economy, government uses budget deficit and budget surpluses. According to this model budget deficit remains low in economic boom and high in economic recession.

Alesina and Perotti (1995) criticize positive theory of fiscal deficit proposed by Barro tax smoothing model. This theory does not explain the cross-country differences and debt accumulation over the years. Their main emphasis is on the need to positive contributions towards the development of political and institutional determinants of budget deficit and debt.

2.3.2 Leviathan Theory of Government

In 1970's the question about the power of tax becomes famous. Brennan and Buchanan (1980) modeled government as profit maximizing leviathan. According to this theory government always wants to extract extra tax revenues from citizens in order to provide

public good and services. According to this theory government is profit maximizer and keeps control of economy as much as possible. But the leviathan theory is inconsistent even in the years of stable government spending. This theory would also imply sharp increase in government spending even in the decades of full employment.

Wagner (1982) proposed Wagner law. According to this law there exist positive correlation between government expenditures and economic development. As in developed countries, the ratio between expenditures and economic growth grows in absolute as well as relative term. This relationship is due to three main reasons. Firstly, increasing government spending is a necessary function of government in case of increase in population and urbanization. Secondly providing public goods and services to the citizens are the main objectives of the government. Thirdly in case of increase in technology and capital investment, state has to participate in production and hence increase spending.

Keynes also supports the idea that during recession government expansionary policies boost economic growth. But Keynes theory and Wagner's law have different perspective. According to Keynes causality run from expenditures to economic growth while according to Wagner's causality runs from economic growth to spending.

2.3.3 Political Theory of Government Debt and Deficit

Cukierman and Meltzer (1989) explain theory of budget deficit that is based on re distributional effect of debt. There exists tradeoff between taxes and debt. Individuals are different in their preferences and also preferences of future generations and bequests. Negative bequest individuals finance current consumption by transferring resources from

future generation. Individuals who are negative bequest transfer the debt to future generations to reduce the tax burden without reducing expenditures. If the share of negative bequest individuals in total population is more, then the government is more likely to incur budget deficit.

2.3.4 Positive Theory of Budget Deficit

Alberto and Teballini (1987) focus on positive theory of public debt and deficit. They reject the assumption that benevolent social planner always maximizes the citizen's welfare. They explain that public debt is used as instrument which can influence the choice of successors. Interactions of different governments at offices during different time represent the time path of debt. Fiscal policy differs due to the use of office at different time by different planners. Their theory shows that if the benevolent social planner is confident for re appointment then the economy tends to incur larger debt. There exists budget deficit biasness during different democratic governments. They conclude that higher degree of polarization between different governments results in higher debt. If the government has to face constraint in order to provide minimum level of public goods, then this will also lead to higher debt.

2.4 Empirical Review of Budget Deficit

2.4.1 International Studies (Panel)

Morrison (1982) investigates the effect of structural factors on budget deficit. The research is conducted for 31 developing and 14 developed countries using data from 1961 to 1975. The analysis was carried out through multiple regression analysis. Structural factors used in this study are level of economic development, growth of government

sectors. The study recommends taking proper measures to reduce revenue instability as it is main cause of expenditure instability.

De Haan and Zelhorst (1990) analyze the relationship between budget deficit and money growth in developing countries. The study uses the vector autoregressive model (VAR) for 17 developing countries for the 1961 to 1985. The study shows that there is no relationship between budget deficit and money growth. There may be positive relationship between money growth and inflation during acute periods where average inflation for three years would be more than 80 %.

Roubini (1991) analyze economic and political determinants of budget deficit in developing countries. The study uses cross section data of 77 countries for the period 1971 to 1982. Their empirical model rejects the optimizing models of fiscal deficit, tax rates, and inflation. They measure the degree of political instability as frequency of government change (include both regular change (democratic process) and irregular changes (military coups)). For the measure of economic backwardness and economic performance GNP per capita is used as proxy. The study concludes that democratic governments are more likely to run budget deficit than military governments. The reason for failure of equilibrium approach of fiscal policy is that budget deficit may be determined by political factors and cross country differential in budget deficit may depend on political instability. Their result shows that increase in political instability increases budget deficit.

De Haan and Sturm (1997) analyze the relationship between central bank independence and budget deficit and check whether monetization of budget deficit is

effected by central bank independence. The study uses panel data set of 30 developing countries and collect data from IMF for the period 1950 to 1994. The study further divided the data into two sub categories from 1950 to 1972 and from 1973 to onward. First period is related to fixed exchange rate regime and the other is related to flexible exchange rate regime. The study concludes that effect of central bank independence on monetization of budget deficit is depending on proxies used for central bank independence. If central banks turnover rate or political vulnerability index is used as proxy, then monetization of budget deficit is negatively related with central bank independence otherwise there is no relationship between budget deficit and central bank independence.

Schuknecht (1998) analyze fiscal policy instrument through which election outcomes are influenced. The study uses annual data from 1973 to 1992 for twenty four developing countries. Empirical analysis of the study is based on fixed effect model. The study uses fiscal balance, government revenues and expenditures as dependent variables in separate estimations. The study found that public investment cycles are prominent fiscal instrument before elections. Governments use expenditure expansionary policies and not focus on tax reductions during election periods.

Vieira (2000) analyze the impact of inflation on budget deficit. The study uses annual time series data from 1950 to 1996 for six European countries. The study applies Lag Augmented VAR (LA VAR) methodology which was proposed by Toda and Yamamoto (1995). The result indicates that there exists long run relationship between budget deficit and inflation. Main conclusion of the study is that budget deficit does not causes inflation rather inflation cause higher budget deficit.

Tanzi (2000) analyzed the relationship between budget deficit, inflation and lags in tax revenue collection for Latin American countries. The study concludes that higher revenues also lead to increase in budget deficit and this deficit was due to inefficient and deficient government social programs.

Woo (2003) analyze economic variables in determining budget deficit. The study uses sociopolitical and institutional variables in their analysis. The study uses almost 40 variables for the time period 1970 to 1990 using panel of 57 developed and developing countries. As OLS estimates give inconsistent results due to outliers in the data they use robust estimation namely least median of squares (LMN) in their analyses. The study concludes that sociopolitical instability, large cabinet size and inequality in income are positive determinants of budget deficit. Weakness of government as well as type of government regime does not contribute to budget deficit.

Tujula and wolswijk (2004) analyze the fiscal performance for OECD and European countries. The study uses data from 1972 to 2002 for twenty-two countries and analyzed through pooled least square and SUR techniques. The study concludes that debt, economic growth and political factors are significant determinants of budget balances. Election year's results in budget deficit and asset prices have limited effect on budget balances.

Adam and Bevan (2005) investigate the impact of fiscal deficit and debt stock on economic growth. The study uses panel of 45 developing countries for the time period 1970 to 1999. Data is collected from World Development indicator and Government Finance Statistics. The study checks the presence of threshold level of growth impact on

public good and services. According to this theory government is profit maximizer and keeps control of economy as much as possible. But the leviathan theory is inconsistent even in the years of stable government spending. This theory would also imply sharp increase in government spending even in the decades of full employment.

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revenues, instability of government revenues, extent of government participation in the economy and government control over expenditures. The study uses GDP per capita as a proxy for economic growth and development. Overall government expenditures are used as proxy for extent of government participation in the economy. The study constructs the variable government control over expenditure as the ratio of government expenditure instability and government revenue instability. Instabilities are calculated from standardized coefficient of variation from time trend equation. The results shows that increase in growth of government revenues will not reduce budget deficit due to the possibility of please effect. Countries with low level of economic development and with high degree of government participation have relatively large budget deficit. Government with greater control over expenditures will have relatively smaller budget deficit. Instability of government revenues is positively associated with budget deficit.

Lim (1983) analyzes the instabilities associated with revenues and expenditures in developing countries. The study uses data from 1965 to 1973 for 45 under developed countries. Measure of instability is based on standard error of concerned variables obtained from linear regression for the period 1965-1973. Graphical analysis of the study shows positive relationship between revenue and expenditure instability and availability of international reserves weaken this relationship. The study analysis is based on ordinary least square regression analysis. The result shows that revenue instability was the main cause of expenditure instability. And expenditure instability associated with revenue instability can be reduces by the use of international funds, internal and external borrowing and foreign grand. The results indicate that the main sources of instability in spending is associated with recurrent expenditures such transport, defence and education

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Woo (2003) analyze economic variables in determining budget deficit. The study uses sociopolitical and institutional variables in their analysis. The study uses almost 40 variables for the time period 1970 to 1990 using panel of 57 developed and developing countries. As OLS estimates give inconsistent results due to outliers in the data they use robust estimation namely least median of squares (LMN) in their analyses. The study concludes that sociopolitical instability, large cabinet size and inequality in income are positive determinants of budget deficit. Weakness of government as well as type of government regime does not contribute to budget deficit.

Tujula and wolswijk (2004) analyze the fiscal performance for OECD and European countries. The study uses data from 1972 to 2002 for twenty-two countries and analyzed through pooled least square and SUR techniques. The study concludes that debt, economic growth and political factors are significant determinants of budget balances. Election year's results in budget deficit and asset prices have limited effect on budget balances.

Adam and Bevan (2005) investigate the impact of fiscal deficit and debt stock on economic growth. The study uses panel of 45 developing countries for the time period 1970 to 1999. Data is collected from World Development indicator and Government Finance Statistics. The study checks the presence of threshold level of growth impact on

budget deficit and it's financing using bootstrap technique. The result shows that if the deficit is less than or equal to 1.5% of GDP than it is growth enhancing and reduction of budget deficit beyond this level have associated with payoff cost. If the deficit is greater than 1.5 % of GDP then it will put adverse impact on growth. They use overlapping generation model of saving behavior embedded in endogenous growth model. The study concludes that there is positive impact of taxes and grant on economic growth and impact of budget deficit on growth is depends on method of financing it. if budget deficit is financed by taxes, grands and limited seigiorage then it is growth enhancing and if the deficit is financed through debt then it is growth-inhibiting.

Combes and Saadi-sedik (2006) analyze the effect of trade openness on budget deficit. The study uses data for the period 1974 to 1998 to analyze GMM-system estimator for the panel of sixty-six developing countries. The result shows that trade openness increases a country exposure to external shocks that put negative impact on terms of trade instability. Trade openness adversely affects the budget balance but the policy induced openness is favorable for budget balance. The study also explains that Trade openness influence budget balances through several channels e.g. corruption, income inequality etc. The study further indicate that trade openness has impact on Kenya budget balances as their aggregate demand is not fulfill by domestic production. Import products are increases as country own production is not sufficient. This will put negative impact on GDP, then reduce tax revenue of the government and hence result in large budget deficit.

Adedeji and Williams (2007) analyze fiscal performance in CEMAC and WAEMU. The study uses panel data set from 1990 to 2006. The analysis of the study is based on

fixed effect and system generalized method of moment (S-GMM). The study considered primary fiscal balance as dependent variable. The result shows that debt and lagged budget balances have significant positive relationship with budget balances in both zones. Terms of trade have positive impact on budget balances in CEMAC while negative impact on budget balances in WAEMU. GDP per capita and openness both have significant positive impact on budget balances in both zones. The study recommends developing supplementary fiscal related criteria that focus on influential effect of output and terms of trade.

Furceri (2007) analyzes the impact of expenditure volatility on growth. The study uses panel data set from 1970 to 2000 for 116 countries. Expenditure volatility is computed through Hodrick and Prescott filter which decompose the cyclical and trend components of government expenditure. The study uses standard deviation of cyclical component of government expenditure in analysis. The study found negative relationship between growth and expenditure volatility. The main conclusion of the study is that higher government volatility is associated with low growth and this relationship is strong in developing countries but not in OECD developed countries.

Bayar and Smeets (2009) analyze economic as well as political and institutional determinants of budget deficit in 15 European countries. The study uses data for the period of 1971 to 2006. The study uses the estimation technique of Beck and Katz (1995) in their analysis. The study concludes that unemployment significantly increases budget deficit due to increase government spending. And GDP growth and budget deficit have significant negative relationship. The study also found that interest rate or debt servicing have positive effect on budget deficit. Institutional determinant of budget deficit in the

study is the agreement of Maastricht treaty signed by European countries which significantly reduces budget deficit. The study found that political variables are weak determinant of budget deficit in selected European countries.

Keho (2010) analyzes the causal relationship between government expenditures and revenues for Côte d'Ivoire. The study uses annual time series data for the period 1960 to 2005. Empirical analysis of the study is based on Granger causality test which include both methods ECM model and Toda and Yamamoto (1995) and variance decomposition test. The study found unidirectional causality that runs from revenues to expenditures. Main recommendations of the study are that government should focus more on reduction of spending in order to reduce budget deficit rather than spending increase.

Alesina and Ardagna (2010) investigate the effect of different compositions of major changes in fiscal policy. The study uses panel of OECD countries from 1970 to 2007. They collect data from OECD economic outlook data base number 84. Methodology is based on simple regression model. The result shows that fiscal adjustment based on tax cut are more likely to increase growth than spending and for fiscal stability and reduction in budget deficit there must be reduction in spending.

Javid et al. (2011) analyze the sources of volatility of budget deficit for South Asia and ASEAN countries. The study analyzes through dynamic panel model of Blundell and bound (1998) and GMM technique for the period 1984 to 2010. The study concludes that political and institutional factors have direct impact on fiscal deficit instability. The result shows that political stability, democracy and good social and economic condition reduce budget deficit volatility while corruption and low institutional quality increase budget

deficit volatility. The analysis also indicates that ASEAN countries have less budget deficit instability.

Ebeke and Ehrhard (2012) analyze the sources and consequences of tax revenue instability in Sub-Saharan African countries. The study uses panel data set for 39 countries. The study estimates their model for the period 1980 to 2005. The study analyzed through OLS estimator with Newey west standard error. Instabilities are computed through 5 year rolling standard deviation. For level of economic development, they use GDP per capita as proxy. External sources of funding such as foreign debt and foreign aid are used as control variable. The result shows that level of economic development is negatively related with instability of public spending. The study also concludes that external debt has no effect on instability of spending. Instability of revenue is transformed into instability of expenditure. If the variations in tax revenue are temporary, then this will not reduce public spending. Instability of tax revenue has higher impact on public investment then public consumption. Instability of revenues leads to more reduction in investment than consumption. The result also indicates that relationship between public investment instability and public investment ratio is negative.

2.4.2 Studies on Individual Countries (Time Series)

Dornbuseh (1984) examines the role of disequilibrium exchange rate and budget deficit on external debt. The study is conducted for three countries Argentina, Chile, and Brazil for the period 1978 to 1982. The study concludes that in Chile extreme overvaluation of currency increases the demand of imports while in Argentina

overvaluation of exchange rate with financial instability results in large scale capital flight and in Brazil budget deficit is the cause for increase in external debt.

Aghevli and Khan (1977) develop a dynamic model of inflation and deficit financing. The study uses annual time series data from 1951 to 1972. The study estimates the model for Indonesian economy. The result shows that money supply effect on budget deficit is almost on one to one bases. Per their model with money creation nominal value of revenues increases but real values fall due to inflation thus leads to increase budget deficit and this deficit is financed through money creation. This self-perpetuating process will continue until efforts are made for speed adjustment in tax revenue collection.

Osoro (1997) evaluates the causality between government expenditures and government revenues and in second phase the study analyzes the causality between government spending and budget deficit. Quarterly time series data is used for the period 1986 to 1992. Augmented dickey fuller test is used to check that the series are stationary or not. Causality between the variables is checked through Granger Causality test. The study concludes that public spending is caused by revenues while revenues are not caused by spending. In Tanzania government spending, has been determined by politics and then increase tax revenue accordingly. For optimal fiscal policy spending, should be determined by revenues. The study concludes that growth in government spending is one of the main causes of budget deficit and there is bidirectional causality between budget deficit and government spending. Budget deficit reduces the perceive cost of public goods and thus spending will increase. They recommend that the policies to reduce budget deficit should be consistent to curtail public spending.

Hondroyiannis and Papapetron (1997) analyze the direct and indirect effect of budget deficit on inflation. The study uses annual time series data from 1957 to 1993 for Greece. The study apply augmented dickey fuller test for unit root and for co integration they apply the test suggested by Johansen and Juselius. After applying these pretests, causality between inflation and budget deficit is checked through Granger causality test. The study found long run relationship between inflation and money supply for Greece. The study concludes that budget deficit has indirect effect on inflation. The study also found bidirectional causality between budget deficit and inflation i.e. budget deficit leads to increase inflation while inflation leads to increase budget deficit.

Metin (1998) analyze the empirical relationship between inflation and budget deficit for Turkish economy. The study uses data from 1950 to 1987. The study uses multivariate co integration analysis in their estimation. The study conclude that scaled budget deficit immediately increases inflation while real income growth has negative impact and positive second lag effect on inflation. Monetization of budget deficit also effects inflation.

Joseph (2008) analyzes the determinant of fiscal performance in Kenya. The study uses annual time series data for the period 1975 to 2006. The study follows three gap model. Analysis of the study is based on descriptive statistic, error correction model (ECM) and ordinary least square (OLS) estimations. The results of the study shows that both trade openness and debt servicing have significant negative impact on budget balances or surplus while treasury bill rate have positive impact on fiscal balance. GDP per capita has also positive impact on budget balances.

Lozano (2008) analyze causal long run relationship between budget deficit, inflation and money growth. The study uses annual time series data from 1955 to 2007 in Colombia. The study analyzes long run relationship through vector error correction model (VECM). The study finds strong relationship between inflation and money growth and also between money growth and budget deficit. The study considered Sargent and Wallace hypothesis is the most appropriate technique for Colombia as their result concludes bi directional causality between budget deficit and money growth i-e budget deficit causes money growth and money growth causes budget deficit.

Maana et al. (2008) analyze the impact of public domestic debt on Kenyan economy. The study uses data from 1996 to 2007. In their analysis, the study uses Barro growth model. Data is collected from Kenya national bureau of statistics. Their result found that with adequate financial development, domestic debt does not crowd out private investment in Kenya. The study found that high domestic debt leads to higher interest payment which in turn reduces government revenues leading significant effect on budget deficit.

Kosimbei (2009) analyze the effect of budget deficit on macro-economic performance in Kenya. The study uses annual time series data from 1963 to 2007. The data used in the study is collected from economic survey and republic of Kenya. According to this study inefficient budgetary process and structural factors of budget deficit are main determinant of budget deficit. The study mentions that the sources of budget deficit are following: level of economic development, instability of government revenues, growth of government revenues, extent of government participation in the economy and government control over expenditure. These structural factors are significantly

responsible for Kenya budget deficit. The study also empirically analyzed the effect of budget deficit on macro-economic variables such as GDP growth rate, money supply, private investment and consumption, treasury bill rate and current account balance. The study followed Mundell-Fleming Model. Phillips Perron and Augmented Dickey Fuller test are used for unit root test. To check long run relationship between variables the study uses Johansen cointegration method. The relationships between variables were examined through VAR impulse response and variance decomposition analysis. The study shows significant effect of budget deficit on selected macro-economic variables for long run.

Tiwari and Kumar (2011) analyze the determinants of budget deficit in India. The study analyzes the impact of different variables through descriptive statistic and Ordinary least square (OLS) estimation. The study uses broad money as money supply and consumer price index (CPI) as inflation. The study uses data from 1976 to 2009 for Indian economy. Data is collected from handbook of statistics of reserve bank of India. The study concludes that inflation has no effect on budget deficit while government spending and money supply significantly effect on budget deficit in India.

Kuncoro (2011) estimates fiscal sustainability for Indonesia. The study uses annual time series data from 1999 to 2009. The study uses least square technique in empirical analysis. The study uses both domestic and foreign debt in analysis. The study found that Indonesian government is not sustainable. Further conclusion of the study is that domestic debt mainly contributes to fiscal sustainability rather than foreign debt. The study recommends that government should use prudent policy in issuance of government securities also keeping view the burden of repayment of debt.

Okech and Mburu (2011) analyze Kenya tax revenue responsiveness to changes in national income. For this purpose, the study determined elasticity and buoyancy of tax revenue. The study uses data for the period 1986 to 2009. Data is collected from economic survey, Kenya statistical abstract and IFS. To check the time series properties of the data the study use augmented dickey fuller test. The study uses a multiplicative model of elasticity and buoyancy through a causal research design. The study concludes that Kenya has inelastic tax revenue and is not buoyant. The study found that large tax revenues are collected through discretionary tax policy not from responsiveness of tax revenue to changes in income. To increase tax revenue collection there should be tax reforms and efforts should be made to reduce tax evasion.

Devapriya and Ichihashi (2012) analyze the relationship between inflation and budget deficit. The study uses time series data from 1950 to 2010 for Sri Lanka. They analyze through VAR model. Their analysis shows bi-directional causality between budget deficit and inflation. Their result also shows positive relationship between budget deficit and inflation.

Onyango and Ochieng (2013) examine the determinant of budget deficit in Kenya. The study uses data from 2003 to 2012. Multivariate linear regression model is used in the analysis. The study uses government revenues, debt servicing, government expenditures and revenues from external sources as main determinant of budget deficit. The main conclusion of the study is that growth in debt servicing and government expenditures significantly positively increases budget deficit while increase in ordinary government revenues and revenues from extra sources reduces budget deficit.

Gongera *et al.*, (2013) analyze how budget deficit can be reduced through inflation, government expenditures and tax policy. The main objective of their study was to evaluate effective economic measures to reduce budget deficit. The research is based on descriptive analysis and data is collected from both primary and secondary sources. The study concludes that tax policy and government expenditures were main causes of budget deficit. The study also found higher contribution of inflation to budget deficit for Kenyan economy

Kaplanoglou and Rapanos (2013) analyze fiscal crises in Greece. The study analyzes through deviations and forecast errors of main variables for the time period 2001 to 2009. The study concludes that persistent fiscal deficit was government own choice and there is no proper mechanism to control budget deficit in Greece. Fiscal institutions fail to pinpoint the deviations of government expenditures and revenues from the target level. Greece poor performance is attributed to inadequate financial management and poor fiscal institutions.

Boylan *et al.*, (2014) analyze the implication of federal personal income tax increase in United States. The study uses annual data from 1970 to 2008 and estimate generalized linear model. They obtained data from internal revenue service, government accounting office and US census bureau. Their study concludes that increase in income tax will result in increase in tax evasion and lower tax collection and hence it will increase budget deficit.

Rubio and Plana (2015) analyze the impact of different measures in order to reduce budget deficit in Spain. These measures are based on either increase in taxes or reduction

in expenditures or both. Their analysis is based on general equilibrium model (CGE). The study found that although all measures reduce budget deficit but at the same time detoriates economic growth and employment level and increases unemployment. The study further concludes that increase in income tax combined with reduction in expenditures leads to put adverse impact GDP growth and employment level and the impact is highest in this case. Indirect tax increases has smaller negative impact on GDP and employment. The study found that reduction in expenditures lead to unequal income distribution. Expenditures on health and education are growth enhancing so reduction in these expenditures reduces economic growth.

Edame and Okoi (2015) analyze the impact of fiscal deficit on economic growth during democratic and military regime in Nigeria. The study uses chow endogenous break test, unit root and Co-integration test. The result shows significant impact of fiscal deficit on economic growth during military regime and insignificant impact of fiscal deficit on economic growth during democratic regime.

Moraru and Nancu (2016) examine the impact of budget deficit and public debt on economic growth in Romania. The study uses quarterly data collected from national institute and Eurostat publications. Descriptive statistic analysis and linear multi factorial regression is used in their analysis. The research concludes that budget deficit has positive impact on economic growth in Romania. The study reject the neoclassical theory i.e. budget deficit and economic growth has positive relationship. The study support Keynesian theory i.e. positive relationship between budget deficit and economic growth.

2.4.3 Studies on Pakistan (Time Series)

Sajid and Raiz (2005) analyze the causal relationship between budget deficit, inflation and money supply. The study uses quarterly data from 1971:1 to 2003:4 for Pakistan. The stationary of variables are check through augmented dickey fuller test. They apply Vector Error Correction model to analyze the causal relationship between variables. The study also uses different measures of money supply and inflation such as M1, M2, GDP deflator, CPI, and WPI. The result shows bidirectional causality between budget deficit, money supply and inflation in the long run. The result also indicates that budget deficit financed through money creation leads to inflation which further accelerate budget deficit.

Subhani (2010) analyze the relationship between tax rate, inflation rate and balance of trade in Pakistan. The study obtained data from State Bank of Pakistan bulletin, the annual report and some various issues from economic survey of Pakistan for the period 1979 to 2009. The study use regression model and two step least square (2SLS) test in their analysis and conclude that there is no significant association between tax rates on inflation rate in Pakistan and there is significant impact of tax rate on balance of trade.

Siddiqi and Ilyas (2011) analyze the impact of revenue gap (gap between actual revenue collection and estimated revenues) on debt, budget deficit and economic growth. The study uses data from 1980 to 2008 for Pakistan. Empirical estimation is based on ARDL co-integration approach. The result shows long run relationship of revenue gap

with budget deficit and economic growth. The study does not find any relationship between debt burden and revenue gap.

Subhani *et al.*, (2012) analyze Granger causality between government revenues and expenditures for Pakistan. The study uses time series data from 1979 to 2010. They analyze through Granger causality test. The result shows uni-directional causality between government revenues and expenditures running from revenues to expenditures. The result also indicates that government spending is determined by revenues. The study recommends that policy makers should not increase taxes in order to reduce budget deficit because this increase in revenues will shift into increase in expenditures.

Anwar and Ahmed (2012) analyze political factors in determination of budget deficit in Pakistan. They investigate the relationship between budget deficit, democracy and cabinet size for the period 1976 to 2009. The study analyzes both the short and long run relationship between these variables. In the study Government size is used as proxy for cabinet size, and index of civil liberties and political rights are used as proxy for democracy and GDP is used as control variable. The study uses bound testing approach to co-integration and error correction model in an ARDL model. The result shows that large government size and huge administrative expenditures will significantly increase budget deficit whereas GDP has negative long run relationship with budget deficit (higher level of GDP will reduce budget deficit in the long run) and democracy can help to reduce budget deficit as it lack democracy has positive relationship with budget deficit but it coefficient is statistically insignificant.

Ramzan *et al.*, (2013) investigate the impact of budget deficit on economic growth in Pakistan. The study uses data for time period 1980 to 2010. In their analysis, they apply OLS regression analysis and Pearson Correlation test and descriptive analysis. The results shows positive relationship between budget deficit and economic growth while negative relationship between inflation and GDP.

Ahmad (2013) analyzes the relationship between economic growth and budget deficit. The study uses annual time series data from 1971 to 2007 for Pakistan. The study check unit root through Augmented Dickey Fuller test. Their analysis is based on Granger causality test and ordinary least square test. The study conclusion based on granger causality test is that there exist bi directional causality between budget deficit and growth. The results based on OLS estimation shows insignificant relationship between budget deficit and economic growth. The study support Recardian hypothesis of neutral relationship between the two variables budget deficit and economic growth.

Yar *et al.*, (2013) analyze the impact of privatization on fiscal balance of Pakistan. The study compares subsidies as expenditures before and after privatization, sales proceeds of state own enterprises and taxes as revenues. Analysis of the study is based on graphical representation. The result indicates that Pakistan does not attain the objective to reduce budget deficit through privatization.

Raheem *et al.*, (2014) evaluate and compare different economic indicators such as budget deficit, debt servicing, exchange range, trade balance, worker's remittances, and currency depreciation during military and democratic regime. The study obtained data from State Bank of Pakistan for the period 1989 to 2005. Their estimation is based on F-

test, T-test and Z-test. The study concludes that military government does not contribute any improvement in key economic variables including budget deficit for Pakistan.

Yousaf & Ali (2014) analyze the impact of budget deficit, government expenditure, exchange rate, remittance and unemployment on poverty in Pakistan. The study applies ordinary least square approach for the period 1980-2011. The results show negative relationship between budget deficit, remittance and government expenditures with poverty whereas unemployment and exchange rate have positive relationship with poverty.

2.4.4 Summary of literature review

Literature review reveals that a large number of studies have been conducted on budget deficit. However there are relatively less studies on the factors determining budget deficit. Existing studies mostly focus on the adverse effect of budget deficit on different macro economic variables like GDP, interest rate, unemployment, level of employment etc. wide range of previews studies also done on two way causation, granger causality and budget deficit financing. Our study aims to find the impact of structural factors on budget deficit experienced in Pakistan over time and we wish to suggest important policy recommendations based on our finding.

Chapter 3

Model, Methodology and Data

3.1 Theoretical Framework and Model Specification

There are some structural factors that affect government budget deficit. These factors are more or less constant as economic characteristics of countries do not change in the short run (Morrison, 1982). Structural factors are determined by the type of economy and its relationship with external economies (Kosimbei, 2009).

The important structural factors may include the following:

1. Level of economic development
2. Growth of government revenues
3. Nature of government, democratic or authoritative/military led regime
4. Government control over expenditures
5. Extent of government participation in economy/size of public sector
6. Instability of government revenues
7. Instability of government expenditures

Developing countries face difficulties in reducing budget deficit due to the presence of such structural factors. The most effective way to reduce budget deficit is to promote economic growth/development. High level of economic growth/development is an important determinant of budget deficit as it is associated with efficient tax revenue. If growth rate increases, then tax revenues will increase as inbuilt mechanism and without any increase in tax rate or change in taxation structure. In this case, there would be no

need to reduce government development expenditures. Increasing growth rate is more effective and safe way to curtail government budget deficit.

Growth of government revenues is also a structural determinant of budget deficit. Government generates revenues from both tax and non-tax sources. however large proportion of revenues are derived from taxes. The proportion of indirect taxes in Pakistan is large as compared to direct taxes. Put differently, the proportion of population paying taxes on their income and wealth is low due to existence of large informal sector that does not pay taxes. On the other hand it is also not easy to increase tax rates because they are already so high. As a result of such difficulties, government gets low tax collection and this causes persistent deficits. Hence government resorts to borrowing from different sources to finance deficit. High deficit would be substantially reduced by designing effective policies that would increase tax revenues or improve revenue collection[1]. Government policies to reduce budget deficit through effective tax policies will not succeed until they do go hand in hand with effective measures to reduce public spending.

Growths as well as stability of government revenues are important for fiscal policy and development planning. In case of instability of revenues, the government faces difficulties to fulfill its development plans. Obviously Governments with high growth of revenues do not need to wrong about deficit financing; the problem is there in countries have slow growth rate of revenues. Instability in government revenues is also associated with the openness of economy. Fluctuations in export and import prices lead to fluctuations in the tax revenues from these sources. Therefore taxes on international trade

[1]Osoro, N. E (1997). Public spending, taxation and deficits.

cannot be relied upon to finance government spending. Pakistan heavily relies on export of primary products where prices of these products are volatile in the world market. A fall in prices of these product prices in world market automatically leads to reduced export earnings. Instability in revenues also results into lowering of usual consumption and investment budget of the government which in turn reduces the level of economic growth and increases budget deficit. Hence, Instability of revenues generates instability in government expenditures (Lim, 1980), which in turn reduces economic growth and leads to increase budget deficit.

Inadequate government control over expenditure is cited as a major source of budget deficit (Mwega and Killick, 1990). Government faces difficulty to control two types of expenditures. First are recurrent expenditures such as salaries of public sector employees and second is huge debt servicing cost. Naturally, these expenditures are difficult to cut[2]. Due to Lack of discipline in execution and allocation of expenditures, budget ceiling set by the government often, gets violated. Moreover, due to price variations, actual expenditures are some time more than budget estimates. In Pakistan, there are many departments involved in budgeting process and due to inadequate co-ordination among the concerned departments, expenditures tracking become very difficult. Government control over expenditure is therefore an important structural determinant of budget deficit.

Extent of government participation in the economy is another important structural factor as government has to participates, directly or indirectly, in the economy to provide

[2] Mwega, F. M., & Killick, T. (1990). Monetary policy in Kenya, 1967-88.

basic infrastructure, defence and other public goods and services. In some cases, it has created state owned enterprises to produce industrial and agricultural goods. Furthermore, it can influence private production through subsidies, taxes or other regulatory tools. High level of government participation increases spending pressure to provide subsidies, tax exemptions and transfers to public enterprises. Larger government size requires more resources to provide public services and finance the relevant operations. Government expenditure decisions are also influenced by political pressures. The quality of budgetary institutions also affects the outcome of fiscal balance. If they spend more on inefficient projects, it puts adverse effect on budget deficit.

The nature of government; democratic or authoritative/military led regimes also determines and reflects the nature of economic policies. The size of fiscal deficit is different in these two regimes. Pakistan economy experienced its first ever budget surplus in history during the military government of General Ayub Khan. Generally, it is stated that military government contribute more for shinning economy and focus more on macro-economic stability and reduction of budget deficit then democratic regime. It may be due to the fact that IMF and World Bank help more with these military governments.

3.2 Empirical Model

We follow the model developed by Morrison (1982). The structural determinants of budget deficit may be written in functional form as:

$$BD = F(\mathbf{GDPP}, \mathbf{GREV}, \mathbf{GPART}, \mathbf{LCONT}, \mathbf{NATR}, \mathbf{BD}(-1)) \quad \ldots\ldots\ldots\ldots\ldots (3.1)$$

The brief explanation is as under:

BD: This represents annual budget deficit as a ratio of GDP

GDPP: The symbol shows growth of GDP per capita which is used as proxy for the level of economic development.

GREV: This represents the growth rate of government revenue.

GPART: The symbol shows extent of government participation in the economy for which we use total government expenditure as proxy and measure it as growth rate of total government expenditures.

LCONT: This represents government control over expenditures. We construct a proxy index for government control over expenditures. It is measured as the ratio of government expenditure instability to government revenue instability: $C_t = \frac{ins\_exp}{ins\ rev}$.

NATR: the symbol shows nature of government, democratic or military-led for which we use dummy variable taking values of 0 during the periods of military-led governments and 1 elsewhere.

BD(−1): it shows the lagged budget deficit since the previous budgetary position can affect the current considerations.

The function may be written in linear form as:

$$BD_t = \beta_0 + \beta_1 GDPP_t + \beta_2 GRev_t + \beta_3 GPart_t + \beta_4 Cont_t + \beta_5 BD_{t-1} + \beta_6 Natr_t + \varepsilon_t \quad \text{..... (3.2)}$$

The rationale behind choosing these variables and their economic relationship with budget deficit is explained below:

The relationship between budget deficit and level of economic development is negative as suggested by theory (Morrison 1982) and common wisdom. High level of economic development leads to increase overall government revenues even if the tax rates are kept constant. This reduces budget deficit overtime without putting any adverse impact on the economy. There is two-way causality between budget deficit and level of economic development as supported by previous empirical literature e.g high level of economic development leads to reduce budget deficit (Morrison 1982) while higher budget deficit results in reduction of GDP through crowing out effect. Increase in budget deficit is likely to increase real interest rate (due to borrowing) which in turn reduces the real investment and hence reduces economic growth (Fatima et al. 2012)

Developing economies face difficulties in curtailing their budget deficit mainly due to these three reasons:

(i) Spending pressure (ii) Low private savings (iii) Low tax revenues

Governments in developing countries have to spend more in the social sector and infrastructure development due to the strong pressure from the general public and from within the parliament. Likewise, there is a positive relationship between private savings and economic development. More private saving will result into more investment, capital formation and high economic growth. However, the rate of private saving is very low in developing countries and so the responsibility of accelerating the process of growth lies mainly on the government. However, financing for economic growth is a serious problem in developing countries. Pakistan, like other developing countries, also faces the problem of low tax revenues due problems in the taxation structure and corruption in the collection system. As such, these countries have to rely on deficit financing or bank

borrowing/money creation that in turn leads to inflation. A high level of economic development reduces inflation if the taxation system is stable, and works as automatic stabilizer to increase real revenues and decrease expenditures in real terms.

- Economic theory suggests that budget deficit is negatively affected by growth of government revenues. As revenues are the components of budget constraint so any change in revenues will lead to change budget deficit. Increase in government revenues either elevates government spending or reduces budget deficit. Economies with low growth of government revenues need more reliance on deficit financing than the economies with high growth of revenues. As with low growth of revenues, government expenditures that are politically such as provision of water, education and infrastructure development etc have to be fulfilled by deficit financing.
- Degree of government participation in the economy is structural factor because government intervention in the economy is difficult to cut or reversed. Economic relationship between budget deficit and extent of government participation in the economy would be positive as high degree of government participation in the economy leads to greater spending pressure and hence larger budget deficit. This relationship is also supported by the work of Morrison (1982). There exists two-way causation between government spending and budget deficit. Persistent and high growth of government spending leads to high budget deficit. The tax price for public goods reduced by deficit financing increases the demand for public goods and services. This further increases spending and increases budget deficit (Osoro, 1997). Increase in budget deficit increases spending because it reduces

perceived price of public goods and tax payers (citizens) increase their demand for public goods. which will result into increased spending (Bachanan& Wagner. 1977).

- Government control over expenditures through sound financial management will lead a steady growth in expenditures parallel to growth of GDP that will reduce budget deficit in years of upward fluctuations in revenue (Morrison. 1982). Inadequate management/ lack of government control over expenditure is one of the major problems of fiscal system. Difficulty is arising mainly on two components of public spending. First are recurrent expenditures such as salaries of public service and second is expenditure on debt servicing. Both of these spendings are difficult to cut down and control (Mwega & killick. 1993). The relationship between budget deficit and lack of government control over expenditure is expected to be positive. Inadequate expenditure control will lead to increase in budget deficit.
- There are differences in preferences of civilian and military governments. Civilian governments have to respond mostly to the demands of the public representatives. While military government focus more on macro-economic stability and control over budget deficit. So, they both have different impact on budget deficit. We expect that military governments are more prone to reduction of budget deficit.

3.3 Extended Empirical Model

Beside these structural factors there are some economic or control variables that may affect budget deficit. So we include Debt servicing, inflation and trade openness

in our model. The structural as well as economic determinants of budget deficit may be written in the generalized functional form as under:

$$BD = \mathbf{F(GDPP, GREV, GPART, LCONT, NATR, BD(-1), DSER, INFL, OPEN)} \ldots 3.3$$

The control variables we use additionally in over model are explained below:

DSer: this symbol shows growth rate of debt servicing on internal and external debt.

Infl: this represent inflation rate for which we use growth rate of money supply as proxy. Broad money m2 is used in our estimation which is equal to m1 plus time deposits plus resident's forcign currency deposits.

Open: This symbol stands for trade openness (growth rate of sum of import payments and exports receipts)

The function may be written in linear form as:

$$BD_t = \beta_0 + \beta_1 GDPP_t + \beta_2 GRev_t + \beta_3 GPart_t + \beta\ Cont_t + \beta_5 BD_{t-1} +$$

$$\beta_6 Natr_t + \beta_7 DServ_t + \beta_8 Infl_t + \beta_9 Open_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots (3.4)$$

Economic relationship of these control variahles with budget deficit are explained below:

- High level of government debt results in huge debt servicing and problems in the ability to repay debt lead to higher budget deficit. Debt service payments will increase overall government expenditures. That in turn increase budget deficit. Effect of Debt servicing on budget deficit is expected to be positive.
- We use money supply as proxy for inflation. The rationale behind using this proxy is that inflation is the major factor affecting government expenditures and

budget deficit. Money creation is an easy and readily available source to finance government spending mostly in developing countries because these countries have ineffective tax structure or they are unable to collect adequate revenues from taxes. However, this increase in money supply will increase the demand for public goods and services and hence the price level goes up (inflation get started). In this situation government expenditures increases more rapidly than its revenues. Nominal revenues remain fixed in short run but in long run real revenues fall due to inflation. Government expenditure commitments are mostly in real term price level increases will lead to increase nominal expenditures. Still if long run government expenditures are match with its revenues then lag in collection of revenues creation (slow adjustment of government revenues with respect to price changes) creates budget deficit due to inflation. Both of these are cause and effect of each other.

- Trade openness captures the effect of external shocks of a country and also lower revenues. External shocks can cause fiscal instability and affect fiscal balance adversely in poor countries. Higher external shocks can slow down economic activities that reduce GDP and level of economic development, which in turns affect budget deficit. High degree of trade openness results in large budget deficit. Trade openness also has negative impact on budget deficit as it impacts enhance economic growth through total factor productivity and accelerate revenue generation process. Thus the relationship between trade openness and budget deficit is ambiguous. In the study of Combes and Saadi-Sedik (2006) trade openness had positive impact on budget deficit through several channels such as

corruption, income inequality etc. while in the study of Adedeji and Williams (2007) trade openness had positive impact on fiscal balance through its impact on TFC that outweigh the negative impact of external exposure.

We also analyze the effect of instability of government expenditure and revenues on budget deficit by further modification in the model.

$$BD_t = \beta_0 + \beta_1 GDPP_t + \beta_2 GRev_t + \beta_3 GPart_t + \beta_5 BD_{t-1} + \beta_6 Natr_t + \beta_7 ins - rev_t + \beta_8 ins - exp_t + \beta_9 DServ_t + \beta_{10} Infl_t + \beta_{11} Open_t + \varepsilon_t$$

..... **(3.5)**

Ins-rev: the symbol represents instability of government revenues

Ins-exp: this symbol shows instability of government expenditures

- Instability of government revenues and expenditures both are positively associated with budget deficit. Expenditure instability and revenue instability are also positively associated with each other. According to Lim David (1983) government revenue instability is the main cause of expenditure instability. Government revenue instability leads to instable government expenditures and both of these instabilities lead to instable government consumption and investment expenditures and hence reduce the level economic development (GDP) on one hand and increase budget deficit on the other.

3.4 Variables Construction

This section explains and describes the variables used in the study.

3.4.1 Dependent Variable

Firstly, in our analysis we will concentrate on main budgetary variables. Different fiscal budgetary measures are used in existing literature. These measures consist of debt and deficits. Gross or net debt measure has been used as broader perspective of government activities than budget deficit (De Haan and Sturm, 1997). However, government defines its annual budget in flow terms such as deficit rather than stock term, like debt. Policy makers focus on flow variables rather than stock variables because stock variables (such as wealth, outstanding debt, exchange rates) are outside the government control and it is harder to target them. So, in our analysis we will use flow variable or the budget deficit as our dependent variable. The budget deficit is defined as total government expenditure over and above the available revenues in a given year. It is taken as the ratio of GDP.

We describe budget deficit as follows: Budget deficit = [Total government expenditures (development expenditures + current expenditures) – Total revenues (tax revenue + nontax revenue)]

3.2.1 Explanatory Variables

Explanatory variables we include in our model are following:

i) Growth of GDP per capita is used as proxy for level of economic growth and development. GDP per capita is better measure of economic development as it summarizes a wide range of economic information and it is used as simple proxy for social and economic welfare. The positive and significant relationship between GDP per capita and speed of development is evident from existing literature (Madhavi - 2014).

ii) Growth of Government revenues is taken as growth of overall government revenues which include both tax and non-tax revenues.

iii) Extent of government participation in the economy is measured as size of government or overall government expenditures net of debt servicing.

iv) We construct a proxy variable to represent government control over expenditures (LCont). The variable chosen is ratio of government expenditures instability to government revenue instability (Morrison, 1982).

$$Cont_t = \frac{ins - exp}{ins - rev}$$

Instability of government expenditures and revenues are calculated by GARCH method. The stochastic variable/ error term (e_t) is included as usual, which is assumed to be distributed with zero mean and constant variance.

v) Nature of government democratic or military-led regime is included in terms of dummies. Value 0 is used for military regime and value 1 for democratic regime.

vi) Debt servicing includes the principle amount and interest payment of outstanding debt that the country has to pay back.

vii) Growth rate of money supply is used as proxy for inflation. We use broad money supply m2 as m2 is 2.5 times less volatile than m1 for Pakistan economy (Chaudhary and Khan 1997). M2 is the sum of m1 plus time deposits plus foreign resident's currency deposits.

viii) Trade openness is simply the growth rate of trade. Trade is sum of exports and imports.

ix) Lagged dependent variable is used for past budget deficit. As large budget deficit, in the past may induce the government to incur to continue the trend. Budgetary

inertia may also be the cause of budget deficit as past fiscal decisions can affect the decisions of current public finances.

3.3 Measure of Instability

We need to calculate instability of government revenues and expenditures in order to formulate the variable "government control over expenditure". In empirical studies. there are two types of techniques commonly used to measure instability. These are ex-ant and ex-post techniques. The ex-ant; technique is used in survey data while ex post technique is used in historical time series data – see Lensink and Bo (1999)

Ex post technique measure of instability is calculated through following ways:

i) Normal statistical variance or standard deviation

ii) Variance or standard deviation of error term

iii) Conditional variance through GARCH method

iv) Variance from Brownian motion

We will measure the instability of government expenditures and revenues from Generalized Autoregressive Conditional Heteroscedasticity (GARCH) method as this technique is most famous to measure instability. Finally, we construct the variable "lack of government control over expenditures" by taking the ratio of the two instabilities.

GARCH model is first developed by Bollerslev (1986).GARCH Model is written as:

$$\sigma_t^2 = a + \alpha e_t^2 + \beta \sigma_{t-1}^2$$

Where $a > 0$, $\alpha > 0$, $\beta > 0$, and $\alpha + \beta < 1$, so that our next period forecast of variance is a blend of our last period forecast and last period's squared return. So the conditional variance at time t is the weighted sum of past squared residuals and the weights decrease as we go further back in time.

After fitting the conditional variance process we may know σ_t^2 and e_t^2. And this allows us to obtain the final standardized residuals series Z_t where as $Z_t = \frac{e_t}{\sigma_t}$. So Z_t is our instability variable. And we construct Government control over expenditure by dividing instability of government expenditures and instability of government revenues.

3.4 The Methodology

Most of the empirical studies use ordinary least square (OLS) estimation [Ebeke and Ehrhard (2012), Alesina and Ardagna (2010), Lim (1983), Morrison (1982), Tiwari and Kumar (2011), Joseph (2008) and Ahmad (2013)] and causality test [Keho (2010), Vieira (2000), De Haan and Zelhorst (1990), Edame and Okoi (2015), Devapriya and Ichihashi (2012), Kuncoro (2011), Kosimbei (2009), Lozano (2008), Metin (1998), Osoro (1997), Hondroyiannis and Papapetron (1997) Anwar and Ahmed (2012) , Subhani *et al.*, (2012) and Siddiqi and Ilyas (2011)] in their estimation. However our model faces the problem of endogeneity as government expenditures and revenues are components of budget deficit. In case of other explanatory variables of the model, such as economic development (GDPP), inflation and government spending, also have endogeneity problem as there exist bidirectional causalities between these variables and budget deficit. Further, as our analysis is based on time series data, therefore there is a chance of potential problem of autocorrelation. In the presence of these problems, OLS gives

inconsistent and biased estimates. To handle these problems, we will use GMM technique.

GMM is efficient technique as it encompasses all properties of ordinary least square (OLS), maximum likelihood and non-linear least square. GMM approach derives estimators from moment conditions. In GMM technique moment conditions are more than parameters. In order to gain efficiency, GMM technique not only handles the problem of endogeneity but also provides heteroskedasticity and autocorrelation consistent standard errors. According to Hansen (1982), GMM gives consistent results under weak distributional assumption as it allows extra moment conditions to solve the problem of heteroskedasticity and serial correlation. We control the problem of endogeneity by using internal instruments by using lag values of the explanatory variables.

3.5 The Data

We will use annual time series data over the period of 1972-2014 for Pakistan. Data on main explanatory variables, namely extent of government participation in the economy measured as overall government expenditures and government revenues are collected from Pakistan economic survey. The data on our primary variable "budget deficit" is derived by subtracting government revenues from total government expenditures. We transform budget deficit as ratio of GDP. The data on debt servicing on internal and external debt is collected from Pakistan economic survey. We get the data on broad money m2 which is used as proxy for inflation and extracted from WDI. The data on imports and exports are extracted from WDI and we transformed it to trade openness by simply adding them. The data on per capita GDP is also collected from WDI. We include

the nature of government, democratic or military led regime; as one of the important determinants of budget deficit in Pakistan. We use dummies for this qualitative variable which takes value "1" for democratic regime and "0" for military led regime. To calculate government revenue instability and government expenditure instability, we use method of Generalized Autoregressive Conditional Heteroscedasticity (GARCH). The variable lack of government control over expenditure is constructed by dividing expenditure instability to revenue instability.

Chapter 4

Results: Discussion and Analysis

In order to examine the structural factors responsible for budget deficit in Pakistan, we follow a multivariate regression model suggested by Morrison 1982. In particular, we want to test the significance of the structural factors explaining budget deficit by gradually modifying the model.

4.1 The Primary Model

We have used the annual time series data of Pakistan for the period 1972-2014 and applied the GMM technique for estimation. The results of equation 3.2 are shown in Table 4.1 below[3].

Table 4.1: Estimation Results - Dependent Variable: Budget Deficit as Ratio of GDP

Constant	GDP per Capita	Govt. Revenues	Govt. Participation	Govt. Control	Bdgt Dfct (lagged)	Nature of Govt.
0.0148***	-0.0756**	-0.1078*	0.1170*	0.00073	0.9066*	0.00088
(0.0079)	(0.0345)	(0.0090)	(0.0186)	(0.0018)	(0.0433)	(0.0024)
F-statistics: 221.869				J Statistics: 0.00000		
Probability (F-Stats): 0.0000						

Note: Standard errors are given in the parentheses. The asterisks (*), (**), (***) show significance level at 1%, 5%, and 10 % respectively.

4.1.1 Discussion and Analysis of Results

- **Level of Economic Development (GDPP)**

We have used growth of GDP per capita as proxy for the level of economic development. It has the expected negative impact on budget deficit, i.e. the higher is the level of economic development, and the lower will be the budget deficit. The relevant coefficient

[3] Before estimation we checked time series properties of the variables. Results are given at appendix-A2

is significant at 5% level. A one percent increase in the growth rate of GDP per capita income, the budget deficit is likely to be reduced by 0.0756%. The rationale is simple to comprehend. With high level of economic development, government revenues are likely to increase endogenously, due to expansionary tax base but without any recourse to increase the tax rates. This is because the wages and profits in the economy will increase and government will be in a position to collect more revenues in form of higher personal income taxes, more value-added taxes and more corporate taxes, and thereby reduce the budget deficit. Thus, striving to push forward the level of economic growth and development is the safest way to reduce budget deficit, without any need for increasing taxes or reducing government development expenditures.

This relationship is consistent with theory as well as with the empirical findings of Morrison, (1982), Anwar and Ahmad (2012), Roubini and Sach (1989), Woo (2003) and Adedeji and Williams (2007) (positive significant relationship with budget surplus), Comes and Saadi-Sadik (2006),and Sirengo (2008), i.e. negative relationship between budget deficit and economic development.

- **Growth of Government Revenues (G. Rev)**

Growth of government revenues shows the expected negative impact on budget deficit. The coefficient concerned is significant at 1% level. Budget deficit decreases in response to increase in government revenues such that 1% increase in government revenues reduces budget deficit by 0.10%. Government revenues could be increased through improvement in tax structure. The significant and negative relationship between budget deficit and government revenues is also supported by the studies such as Morrison, (1982) and Onyango and Ochieng, (2013).

- **Extent of Government Participation in the Economy (G. Part)**

Extent of government participation in the economy has the expected positive impact on budget deficit in Pakistan. Increase in the degree of government participation in the economy increase budget deficit. Since the size of government is positively related to government participation in the economy, we have used the ratio of government spending to GDP as proxy for government participation in the economic affairs. The results show that one percent increase in government participation is likely to increase the budget deficit by 0.1170%. The coefficient is significant at 1 % level. Our results are similar to the finding of Morrison (1982), Anwar and Ahmad (2012), and Onyango and Ochieng. (2013). i.e. high level of government size and huge government administrative expenditures significantly increase budget deficit.

As discussed above, the developing countries have to face more public pressure for the provision of a wide range of public goods and services, particularly the provision of necessary infrastructure and spending in the social sector; health and education. In this situation, it is difficult for the government to cut down its expenditures and control the budget deficit. Government needs finances to provide public goods in form of education, infrastructure etc. However, if the size of the government is too large, then the scarce resources have to be transferred from directly productive avenues to relatively less efficient social sectors and thereby to compromise on economic growth. Another reason is that large (sized) governments also have to control o.: other economic variables such as prices and interest rate. If the objective is to control prices and interest rates, this can be made feasible by provision of subsidies on essential items (fiscal measure) and lowering of interest rates to promote private investment (monetary measure). Obviously, the extra

expenditure has to be borne by the government and the budget deficit increases. Still another prominent reason for persistence in the budget deficit of Pakistan is liability borne by the government in case of public sector corporations (like WAPDA, Railway and the Steel Mills), which are not profitable, rather always suffering losses.

Government participation in the economy is a structural factor, i.e. if government intervention in the economy is high leading to high spending, then it is difficult to reverse the line of action. The general public considers the provision of public goods and services in general, and provision of subsidies on certain items in particular, as their political right. The citizens depend heavily on the government to provide every facility to them and the political opposition exploits this trend. Hence the governments of developing countries face difficulties to control their expenditures and that will result into ever expanding budget deficit.

- **Lagged Value of Budget Deficit (BD_{-1})**

The coefficient of the lagged budget deficit has the expected positive relationship with the current-year deficit. The significant and positive relationship implies high degree of persistence of fiscal deficit. This also implies that current fiscal deficit is determined by previous budget deficit. We included this variable in the model as an indicator of precedence or past experience. Budget deficit is dynamic in nature since it carries the repercussions from the previous periods and allows only slow adjustments over time. The lagged dependent variable is also used to control for serial correlation (Durbin-Watson & Drukker 2003). The coefficient of lagged budget deficit is positive and significant at 1% level, having a value of 0.9066. This means that 90.66% of budget deficit will continue to operate in the next period. A positive and significant relationship of the past experience

with the current status of budget deficit is also found in the study by Roubini& Sachs (1989) and Adedeji and Williams (2007)

- **Nature of Government: Democratic or Authoritative- (Natr)**

Pakistan has experienced several phases of democratic and military-led regimes and the behavior as well as governance styles have been starkly different. We have used dummies for the nature of government, taking the value '1'for democratic regime and '0'for military-led regime. Budget deficit was expected to be high in democratic regimes and low in military-led regime. However and interestingly enough. the impact of difference in regime on budget deficit is insignificant. It means that the nature of government. whether democratic or authoritative, does not affect significantly budget deficit in Pakistan. The result is also supported by the finding of Raheem *et al.*, (2014), Anwar and Ahmad (2012). who develop a variable polity to represent level of democracy and their result is also statistically insignificant. Woo (2003) also finds insignificant effect of regime change on budget deficit for developing countries. The budget in Pakistan remained persistently in deficit during both military and democratic regimes. The main responsibility of military government is to provide defence and safety to the boundaries of a country. It is not responsible and efficient in solution of political matters. Altering the nature of governments did not give any benefit to the general public and to the exchequer in reducing budget deficit. This is the misfortune of Pakistan that none of the two forms of governments could change the economic or social condition of the country. In Pakistan, the problem of budget deficit during military and democratic regime remained awkward.

- **Fiscal Discipline/ Control over Expenditure (Control)**

Lack of Government control over expenditure is expected to be positively related to budget deficit. Although, sign of the coefficient is positive but it is statistically insignificant. Thus we have tried to revise the model by adding some other important structural factors as well as by deleting others.

4.2 The Modified Model

In the alternative specification, we suggest to include some important control variables that have been adversely affecting the budgetary position of Pakistan since long. These variables have assumed the status of structural factors overtime somehow since the picture remains persistent. The variables in question are debt servicing ($DSER_t$) and inflation (inf_t). Debt servicing on external and internal debt absorbs a large fraction of our scarce resources (about 30-40%) and the government is left with no alternative but to run deficit budget and rely on further borrowing for financing. Although, it is part of overall budget (expenditure) but its solitary impact on budget deficit can be seen easily.

Likewise, inflation is a persistent problem in Pakistan and there are numerous reasons responsible for its continuity. The most serious being bank borrowing by the government or extra money creation to finance budget deficit, every year. Like the households and other economic agents, the expenditure of the government is also affected in nominal terms due to inflation. In contrast, government revenues may not increase due to inflation with that speed. Thus, inflation is likely to affect budget deficit positively. We have also included another conditioning variable, namely the trade openness ($Openness_t$) in the model. The results of equation 3.3 are shown in Table 4.2 below.

Table 4.2: Regression Results –Modified Model- Budget Deficit as Ratio of GDP

Explanatory variables	PRIMARY MODEL	MODIFIED MODEL	REMARKS
Constant	0.01477*** (0.0079)	-0.00796 (0.0103)	Insignificant
GDP Per Capita	-0.0756** (0.0345)	-0.0681* (0.025)	Significance level improved
Govt. Revenues	-0.10778* (0.0090)	-0.1122* (0.0099)	Slight change in magnitude
Ext. Govt. Participation	0.1170* (0.0186)	0.1384* (0.0109)	Slight change in magnitude
Govt. Control	0.00073 (0.00178)	0.00302** (0.0014)	Turned out significant
Budget Deficit (lagged)	0.90661* (0.04327)	0.99545* (0.0242)	Slight change in magnitude
Nature of Govt.	0.00088 (0.00243)	0.000566 (0.00182)	Slight change in magnitude
Debt. Servicing		0.02615* (0.00926)	Significant
Inflation		0.05613* (0.0275)	Significant
Openness		0.000222 (0.000630)	Insignificant
F-statistics	221.869	427.81	
Probability (F-stat)	0.0000	0.0000	
J-statistics	0.0000	0.0000	

Note: Standard errors are given in Parenthesis. The asterisks (*), (**), (***) show significance level at 1%, 5%, and 10 % respectively.

4.2.1 Analysis of Results – The Modified Model

Other variables such as level of economic development ($GDPP_t$), growth of government revenues ($G.Rev_t$), extent of government participation in the economy($Ext.G.P_t$) and BD (-1) have the same expected signs and significance levels as in the primary model. The nature of government (*Natr*) continues to remain positive but insignificant so far as its impact on budget deficit is concerned.

- **Fiscal Discipline/ Control Over Expenditures (Control)**

Interestingly enough, government control over expenditure has now the expected positive relationship with budget deficit and it is significant at 5% level. If the government exercised less control over its expenditures, the serious would be the case of budget deficit. The result is supported by theory as also through common wisdom. If government exercises more control over its expenditures through proper financial management, then this will keep the expenditure in the desired steady state and will result into reduction in budget deficit with the passage of time. An increase in the lack of government control over expenditure by 1% will result into 0.00302% increase in budget deficit. The result is also supported by the finding of Morrison (1982). The lack of government control over expenditure is not necessarily due to government inefficiency in controlling its expenditures. Other factors like inflation and instability in revenues collection as well as corruption are equally responsible for high budget deficit.

- **Debt Servicing (DServ)**

The coefficient of debt servicing has the expected positive sign and significant impact on budget deficit. Debt service is the component of government budget that does not provide any benefit to the economy in the current period. Increase in debt service reduces economic growth as more resources are allocated for the purpose out of the existing revenues. Obviously, the government will have to compromise on its spending for development or will continue to run budget deficit, which in turn will be financed through further borrowing and/or money creation. Another reason of increasing budget deficit is that the government is obliged to repay the debt and escape default. If debt servicing increases over time, then raising more funds from donor countries become

difficult since they demand higher interest payments due to higher risk that would further increases budget deficit. One percent increase in debt servicing would increase budget deficit by 0.026%. Our result is supported by the theory and also by the findings of other researchers like Roubini& Sachs (1989) and Onyango, Ochieng (2013) and Joseph Sirengo (2008). According to some researchers, the financing of budget deficit through creation of money today will make burden of debt servicing easier in the future. This is because debt servicing would be included in the expenditures next year that will put pressure on fiscal authority and budget deficit will increase resultantly (Sachs and Larrain 1993).

- **Inflation (Infl)**

As explained above, we have used the growth rate of money supply as proxy for the rate of inflation. The coefficient of inflation has the expected positive sign and significant relationship with the budget deficit. It is significant at 5% level. Increase in inflation by 1% will increase the budget deficit by 0.056%. Inflation increases budget deficit due to lags in tax revenue collection while expenditures move in parallel with inflation. The usual practice to finance budget deficit is by bank borrowing or new money creation, which further increases inflation in the next periods. Due to political pressure, the monetary authorities or the central banks in developing countries are not fully autonomous. If debt financing of budget deficit puts upward pressure on interest rate, then the central banks are forced to finance the same by money creation to stabilize interest rate. With monetary expansion and resulting inflation, both the nominal revenues and expenditures are likely to increase. However, inflation reduces the real value of revenues due to lags in tax collection, which further increases budget deficit. This effect

is also known as Olivera-Tanzi effect (Solomon & Wet 2004). Our results are also supported by the findings of Aghevli, B. B., & Khan, M. S. (1977) and Heller, P. S. (1980). In the study of Woo, J. (2003) inflation is significantly negatively related with budget surplus only for developing countries.

- **Trade Openness (Open)**

We have included trade openness as a control variable in the model. It is given by the ratio of volume of trade to GDP, whereas the volume of trade is the sum of exports and imports. Since Pakistan is experiencing deficit in the balance of trade since long, therefore the coefficient has the expected positive relationship with budget deficit, however insignificant. Thus, the trade openness does not exert any significant impact on the budget deficit. Insignificant positive relationship is also found in the study of Woo (2003). Trade openness is mainly considered as exogenous variable as our export prices are determined in world market and our imports are mainly manufacturing products imported from industrialized economies so they do not put any impact on budget deficit.

4.3 Further Modifications

In view of the above, we modify our model further by deleting all the insignificant variables so that stability and robustness is ensured. To be specific, we drop 'nature of the government' and 'trade openness'. Another modification is that we drop the structural variable 'lack of government control over expenditure' and instead we add its components, the 'instability of government revenues' and instability of government expenditures'. All other variables will remain intact. However, before running the final regression, we have computed the correlation among the explanatory variables so as to escape any inconsistency in the results. The two variables, namely, the instability of

government revenues and instability of government expenditures, are highly correlated. So we may analyze their impact on budget deficit separately. The final results are shown in Table 4.3 below (in comparative format):

Table 4.3: Regression Results –Further Modifications

Dependent Variable: Budget Deficit as Ratio of GDP

Explanatory variables	PRIMARY MODEL	MODIFIED MODEL	MODIFIED MODEL –2	MODIFIED MODEL –3	FINAL MODEL
Constant	0.01477*** (0.0079)	-0.00796 (0.0103)	-0.00745** (0.0038)	-0.00678** (0.00376)	-0.00601 (0.0041)
GDP Per Capita	-0.0756** (0.0345)	-0.0681* (0.025)	-0.0688* (0.0237)	-0.0686* (0.02369)	-0.06933* (0.0256)
Govt. Revenues	-0.10778* (0.0090)	-0.1122* (0.0099)	-0.111213* (0.00727)	-0.110446* (0.00733)	-0.1124* (0.0099)
Ext. Govt. Participation	0.1170* (0.0186)	0.1384* (0.0109)	0.14419* (0.00963)	0.14332* (0.009446)	0.13810* (0.00937)
Govt. Control	0.00073 (0.00178)	0.00302** (0.0014)	-	-	0.00272** (0.0439)
Budget Deficit (lagged)	0.90661* (0.04327)	0.99545* (0.0242)	0.997067* (0.02883)	0.99075* (0.028375)	0.9649* (0.01987)
Nature of Govt.	0.00088 (0.00243)	0.000566 (0.00182)	-	-	
Debt. Servicing	-	0.02615* (0.00926)	0.03267* (0.00607)	0.032679* (0.006054)	0.02584* (0.00722)
Inflation	-	0.05613* (0.0275)	0.05225* (0.02043)	0.051596* (0.02048)	0.05497** (0.00130)
Openness	-	0.000222 (0.000630)	-	-	-
Instability-Revenues	-	-	0.000828** (0.000428)	-	-
Instability-Expenditure	-	-	-	0.00087** (0.000427)	-
F-stat	221.869	427.81	225.983	232.377	492.3307
Prob(F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000
J-statistics	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Standard errors are given in Parenthesis. The asterisks (*), (**), (***) show significance level at 1%, 5%, and 10 % respectively.

4.3.1 Analysis of Results – The Final Modified Model

As discussed above, we dropped two variables, namely nature of government and trade openness, being insignificant. Likewise, we substitute the variable 'lack of government control over expenditure' by 'instability of government revenues' and instability of government expenditures' one after the other. All other explanatory variables such as level of economic development ($GDPP_t$), growth of government revenues ($G.Rev_t$), extent of government participation in the economy($Ext.G.P_t$), inflation ($infl_t$), debt servicing ($DServ_t$), and (BD_{t-1}) have the same expected signs and significance level as discussed earlier under the modified model (section 4.2.1). The magnitudes of relevant coefficients are also more or less the same. The impact of two newly introduced variables, which replaced the 'lack of govt. control over expenditures' is discussed below.

- **Instability of government revenues**

Instability of government revenues has the expected positive relationship with budget deficit. The coefficient is significant at 5% level. Budget deficit increases in response to increase in instability of government revenues such that one percent increase in the instability of increases budget deficit by 0.00082%. Instability in government revenues is often high in case of developing countries. It weakens the ability of government to provide public goods and services efficiently. Revenue instability leads to instability in public consumption and investment thereby resulting into overall reduction in economic growth. Instability of revenue is due to low growth rate or low GDP per capita, high output variance (high instability in GDP) and inflation. Due to these factors, instability in

revenues increases, which in turn increases budget deficit. Our result is also supported by the study of Morrison, (1982).

- **Instability of government expenditures**

Instability of government expenditures has the expected positive relationship with budget deficit. The coefficient is significant at 5% level. One percent increase in instability of government expenditures will increase budget deficit by 0.00087%. In developing countries, expenditure instability is associated with revenue instability. Countries with high tax revenues, the instability in tax collection leads to expenditure instability (Bleaney et al 1985). If government revenue falls due to some unforeseen factors, then government should reduce its expenditures but it is often difficult particularly in case of recurrent expenditures. Limdevid (1983) found defence, education and transport sectors as the main sources of government expenditure instability. These three sectors have high share in total government expenditures and it is very difficult to cut down expenditure in these sectors, particularly defence in case of Pakistan. Instability of government expenditures is also due to inefficient fiscal management, and development planning. Instability of government spending is negatively related with economic growth (Ebeke and Ehrhart 2012). Low growth rate leads to increase budget deficit because of fall in revenues. However, if government receives more international aid, grants and donations, then the gap between revenues and expenditures can be reduced; in other words, the instability of expenditures can be controlled (Lim 1983).

From the above discussion, it is clear that the impact of instability in government revenues and expenditures on budget deficit, although somewhat significant, but it is very

minute. Therefore, the original variable, i.e. Lack of government control over expenditures seems to be more appropriate.

We have run the regression once again using the variable lack of government control over expenditure and the results are shown in Table 4.3 above in comparative format.

Staiger and Stock (1997) suggest that the F-statistics for instrumental variables significance. F statistic is used for jointly significant of instruments. And high value of f statistic is preferable.

Rule of thumb: the F-statistic for (joint) significance of the instrument(s) in the first-stage should exceed 10. And in all cases our F statistic is greater than 10 which means that our instruments are jointly significant

Hansen's J statistic, is used to determine the validity of the over identifying restrictions in a GMM model. The test can ONLY be run if the model is over identified, i.e. if we have more excluded instruments than potentially endogenous variables. Our finding shows zero j statistics because our model is exactly specified.

Chapter 5

Conclusions and Policy Implications

5.1 Summary of Research

The study is intended to analyze the structural factors of budget deficit in Pakistan. For this purpose, we follow the regression model developed by Morrison 1982. His model is for developing countries whereas we implement it for Pakistan. We take the data from 1972 to 2014 from various sources such as WDI, economic survey of Pakistan and hand book of Pakistan economy. We take our dependent variable budget deficit as ratio of GDP whereas level of economic growth and development, growth of government revenues, extent of government participation in the economy, government control over expenditures and instability of government expenditures and revenues are considered as the main structural factors of budget deficit. Other control variables considered in the study are debt servicing, inflation and trade openness. In addition to this we use dummy variable for nature of government democratic or military led regime and capture the impact of both regimes on budget deficit.

Most of the researches on budget deficit only concentrated on selected macro-economic variables but this study goes further to describe the structural factors of budget deficit in Pakistan, also explain budget deficit during different regimes and also considers important determinants of budget deficit such as debt servicing, trade openness and inflation as control variables. Our study focuses both on revenue and spending side of the budget.

Factors responsible for aggravating budget deficit in Pakistan are identified as low level of economic development, high degree of government participation in the economy, low growth of government revenues, lack of government control over expenditure and instable government expenditures and revenues.

5.2 Main findings and Conclusions

We apply GMM estimation technique due to endogeneity problem and use lagged values of explanatory variables as instruments. The study concludes that structural factors have significant effect on budget deficit in Pakistan during 1972 to 2014. The study concludes that high degree of government participation in the economy and low level of economic growth and development are adversely affecting budget deficit. In these circumstances government face difficult to control budget deficit. Government with unstable revenues and expenditures tends to increase budget deficit but this effect is very minute in Pakistan. Lack of government control over expenditure or inadequate expenditure control is positively related with budget deficit. The more government control over its expenditure the more will be the reduction in budget deficit. The impact of budget deficit during different regimes seems to be insignificant in case of Pakistan. Unfortunately, the problem of persistent budget deficit remained during both military and democratic regime and both regimes fails to control budget deficit. Growth in government revenues is negatively associated with budget deficit. Our results support the idea that high growth in government revenues leads to reduce budget deficit. Impact of inflation on budget deficit is positively significant. Higher the rate of inflation higher will be budget deficit. Debt servicing also have significant positive impact on budget deficit. Increase in debt

servicing will lead to increase in budget deficit, whereas the impact of trade openness on budget deficit is found to be insignificant in Pakistan.

5.3 Recommendations

Fiscal balance is an important policy instrument for economic stabilization therefore our conclusion has important policy implication for policy makers and government. Following are the recommendations to control budget deficit in Pakistan.

- There is need to have a prudent fiscal policy so as to avoid budget deficit and ensure that the economy is not adversely affected.
- In Pakistan revenues are mostly depend on taxes so there is need to improve tax structure to increase overall government revenues.
- The impact of debt servicing on budget deficit is positive in our study so the government should reduce debt servicing from both internal and external sources to reduce budget deficit. So, it is recommended that the government should raise money from other sources such as improving tax base and reforming tax structure. There is need to raise funds from concessional grants instead of commercial loans.
- There is significant and negative effect of GDP per capita growth on budget deficit. So, there is need to increase personal income (income of the residents or public) which in turns increase income tax revenue and curtailed budget deficit. The government should make policies that increase economic growth and create more employment opportunities to generate more government revenues and reduce budget deficit.

- In order to reduce budget deficit there should be need to develop such economic policies that reduce bureaucracy or government size and hence reduce government spending.
- For controlling government spending there should be a secretariat that keep check and balance on the use of government resources and monitor them accurately to ensure efficient use of public funds and keep all the details on spending.
- There should be diversification of government revenues by establishing innovative ways of budget financing. Such as there should be need of private public partnership for infrastructure development and pension funds should be utilized for development purposes. Benefits from such modes of financing are more than their cost and reliance on borrowing may be reduced.

Persistent fiscal deficit is common problem of developing countries but it is important for government and policy makers to keep budget deficit in controllable limit.

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Appendix

Table A1: The Correlation matrix

	Cont	G. Rev	GDPP	G. Part	Natr	D. Serv	M Sup	Openness	Ins-Exp	Ins-Re
Control	1									
G. Rev	0.016	1								
GDPP	-0.015	0.235	1							
G. Part	0.117	0.145	0.334	1						
Natr	-0.095	0.057	0.153	0.047	1					
D. Serv	-0.047	0.060	-0.07	-0.428	0.188	1				
M Sup	-0.279	0.045	0.086	0.047	-0.126	0.187	1			
Openness	0.141	0.082	0.273	0.087	0.043	-0.092	-0.013	1		
Ins-Exp	-0.260	-0.005	-0.096	-0.213	0.192	-0.097	0.119	-0.431	1	
Ins-Rev	-0.263	0.023	-0.090	-0.234	0.210	-0.092	0.086	-0.390	**0.992**	1

Correlation shows the level of association between different explanatory variables. We assume that if the correlations among different variables are more than 0.5 then they are highly correlated. And if the value is less than 0.5 then they have moderate or weak correlation. The correlation among different variables is checked through sensitivity analyses. The two variables, namely, the instability of government revenues and instability of government expenditures, are highly correlated. So we may analyze their impact on budget deficit separately.

Unit root test:

Firstly we will use unit root test to check the stationarity of different variables through unit root test where they are stationary at level [I(0)] or stationary at first difference [I(1)]. Variables are said to be stationary if they have same statistical properties such as mean, variance and covariance. Unit root test is important for specification of true model

and for gaining unbiased results. We will use Augmented dicky and fuller (ADF 1979) test. ADF test is famous as it is widely used in econometric models.

The basic model of unit root is as:

$$y_t = \beta y_{t-1} + \varepsilon_t$$

A model with series that have drift is represented as:

$$y_t = \alpha_0 + \beta y_{t-1} + \varepsilon_t$$

A model with series that have trend is represented as:

$$y_t = \alpha_0 + \delta_t + \beta y_{t-1} + \varepsilon_t$$

We plot the graph and get clue from graphical representation whether to include drift or trend.

The hypothesis of unit root test is written as:

H0: series is unit root

H1: series is stationary

We check the hypothesis through computed p value. If p value is less than 5% level of significance, then we reject null hypothesis and conclude that series is stationary. If p value is greater than 5 % then we accept null hypothesis and convert these variables into first difference to make them stationary and again apply ADF test.

Table A2: unit root test results:

UNITROOT AT LEVEL		
	t-stat	**P - value**
BD	-3.1485	0.0000
GDPP	-5.57634	0.0000

G.REV	-10.0460	0.0000
Ext. G. P	-5.60507	0.0000
INF	-5.87036	0.0000
Debt Ser	-8.53005	0.0000
Trade	-5.3728	0.0000

We select the lag length from Schwarz info criterion. All variables are stationary at level.

Above table shows that all variables are stationary at level.