DETERMINANTS OF FISCAL BUDGET DEFICIT VOLATILITY OF SELECTED SOUTH ASIAN AND SUB-SAHARAN COUNTRIES

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CERTIFICATE

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IN THE NAME OF ALLAH

The Most Beneficent

The Most Merciful

"To Allah belongs whatever is in the heavens and whatever is in the earth. Whether you show what is within yourselves or conceal it, Allah will bring you to account for it. Then He will forgive whom He wills and punish whom He wills, and Allah is over all things competent."

(Al-Baqarah, 2:284)

GOLDEN SAYING OF

THE HOLY PROPHET

(Peace and Blessings of Allah be Upon Him)

"Whoever follows a path in pursuit of knowledge, Allah will make easy for him a path to Paradise. No people gather in one of houses of Allah, reciting the Book of Allah and teaching it to one another, but the angels will surround them, tranquillity will descend upon them, mercy will envelop them and Allah will mention them to those who are with Him. And whoever is hindered because of his bad deeds, his lineage will be of no avail to him."

(Sunan Ibn e Majah)

Dedicated

To

My Beloved Parents

(Whose prayers, support and encouragement always enlightened my way)

&

Of course my Honourable Teachers

(Who educate me and made me believe that I can do everything)

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QAISAR KHAN

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Abstract

This study analysed the determinants of fiscal deficit volatility of selected South Asian and Sub Saharan countries for the period 1990 to 2016. Generalize Method of Moments (GMM) is used to deal with problem of endogeneity. Results based on macroeconomic variables indicate that inflation, trade openness, foreign debts and real GDP per capita are the significant determinants of fiscal deficit volatility. Countries with high population growth associated with low fiscal deficit instability. Moreover results based on political and institutional variables indicate that low institutional quality (legal and bureaucracy), high internal and external conflicts, high ethnic and religious tensions and rising corruption may lead to high and persistent fiscal deficit volatility. The results of the current study leads to an important implication, that by improving quality of institutions, creating situations for economic stability and moving towards democratic regimes may ensure more stable fiscal deficits and resultantly positive effect on the long term economic growth.

Abbreviations and Acronyms

LFDV	***Lag of Fiscal Deficit Volatility***
GST	***Government Stability***
FDV	***Fiscal Deficit Volatility***
SEC	***Socioeconomic Conditions***
IPL	***Investment profile***
ITC	***Internal Conflicts***
ETC	***External Conflicts***
CPN	***Corruption***
MIP	***Military In Politics***
RLT	***Religious Tensions***
LAO	***Law In Order***
ETN	***Ethnic Tensions***
DAT	***Democratic Accountability***
BQT	***Bureaucratic Quality***

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CHAPTER 1

INTRODUCTION

1.1 Back Ground of the Study

Fiscal policy plays a vital role in sustainable development of a country. Nations, mostly formed their fiscal policy in such a way that maintain a sound balance between government spending and revenue. The prime objective of fiscal authorities is to formulate fiscal policy in such a manner that insures balance economic growth and development in the economy. The governments can adopt two types of fiscal policies, easy fiscal policy and tight fiscal policy in order to achieve certain economic objectives. However, timing for fiscal policy is an important factor for fiscal authorities. According to (Pettinger, 2012) when an economy operates below its full employment level or facing liquidity trap then in such state of affairs government used easy fiscal policy by lowering tax rate along with raising expenditure by borrowing from both internal and external sources which offset private sector saving and injects money into the circular flow that stimulate employment and economic growth, and hence do not cause inflation or crowding out Contrary to easy fiscal policy, tight fiscal policy can also be used by a nation in order to achieve certain economic goals, when a nation faces inflationary pressure due to excessive aggregate demand, governments practice tight fiscal policy by increasing tax rate rather than tax base to discourage aggregate demand for different goods and services and decreasing government spending.

Generally, deficits arise in nation's budgets when government expenditure exceeds both its tax and non-tax revenues, To finance it governments mostly rely on domestic and foreign debts which may not only create fiscal deficit but also shrinks government expenditure due to low tax revenue (Agenor & Montiel, 1999). Most of

developed and developing nations around the world experienced persistent fiscal deficit, yet high fiscal deficit is more severe for developing countries due to less developed financial markets and weak economic institutions (Fatas & Mohov, 2006).

In economic literature three terminologies have been used to assess the meanings of deficit. The most commonly used terminologies are primary deficit, revenue deficit and fiscal deficit. Primary deficit basically emerges when a government fails to collect sufficient tax revenue and other transfer payments to finance its expenditure. It has been obtained from fiscal deficit minus interest payments on debts while revenue deficit emerges when total revenue expenditure exceeds over total revenue receipts. Fiscal deficit occurred when total government expenditure exceeds over its total receipts excluding borrowings (Agenor & Montiel, 1999). The present work fundamentally concerned with the fiscal deficit. (Excess of total government expenditure over its total revenue excluding borrowings).

1.2 Historical Background

Normally, most of developed and developing countries facing persistent deficits in their budgets from decades, which were initially considered economic phenomena, as before 1980's fiscal deficits identify in nation's budgets because of unexpected war which increased debt to GNP ratio for most countries around the globe (Alesina & Perroti, 1995). But starting from 1980's it has been empirically observed that not only economic factors caused fiscal deficit and its instability, but political and institutional factors also effect budget deficit volatility in both developed and developing nations around the world (Javaid et al, 2011).

Following the oil crises of 1973 most of industrialized countries faced severe budget deficit due to exceptional increase in oil price in the world, although these crises

result both internal and external debt problems along with high debt to GDP ratio. Yet, fiscal deficit and debt level were different for most countries, even facing same economic shocks. This discrimination detected due to regional disparities and different economic situation. So, in order to explore determinants of fiscal deficit and the level of debt one may not only rely on economic theory that explains few macroeconomic determinants of the fiscal deficit (Alesina & Perotti, 1995). However, (Murwirapachena et al, 2013) found economic determinants explain just a part of fiscal deficit, there are other factors too which determine fiscal deficit and its volatility. Therefore, political stability like law and order and institutional factors, like democracy, cabinet size, electoral laws and number of finance ministers may significantly affect fiscal deficit and its volatility (Woo, 2003), (Fatas & Mihov, 2010). Budget deficit can be reduce by bringing institutional reforms, first changes in legislative body that directly regulating the policy formation and secondly general electoral reforms such as changes in electoral law (Alesina & Perroti, 1995).

1.3 Fiscal Deficit Volatility

Not only fiscal deficit is a noticeable problem, but its volatility also emerged as a challenge for most of developed and developing countries around the world. Volatility in budget deficit appears due to instability in government revenue and expenditure. A high deviation between budget deficit and surplus means uncertainty of revenue and unexpected sources of financing of public expenditure. (Breunig and Koski, 2011) explain that why low budget deficit volatility is important for an economy accordingly the impact of huge volatility in government expenditure alters the source of financing. The same author defines budget deficit volatility as variation in government revenue and expenditure. High fiscal deficit volatility is bad for growth, bad for investment, and bad for the poor. Because the poor are typically less able to cope with high volatile fiscal

deficit (Shaxson, 2005). Variation in budget deficit makes fiscal authorities restrain for the following reasons. First due high fiscal deficit volatility, it is difficult to assess the size and timing for fiscal policy which further results inconsistency in economic decisions. Second fiscal deficit volatility causes government expenditure volatility, which leads to unpredicted sources of financing usually by borrowing or by deficit financing (Eugenia & Mara, 2012). A volatile budget deficit may reduce government efficiency of services, like providing health and education services. Third, projects conversion take place as long-term investment projects convert to short-term because the government preferred short term investment project due to inconsistency in availability of funds which ahead result human capital losses.

Based on the studies conducted by different researchers we concluded that not only budget deficit is a crucial problem but volatility associate with fiscal deficit is also a major issue facing by both developed and developing nation around the world. Furthermore volatility in tax revenue forces the governments to finance their short-term expenditures from unexpected sources, like by deficit financing or by borrowing form internal or external sources. So, keeping in view the importance of the determinants of budget deficit volatility, the ongoing effort basically derives attention to the major determinants that contribute to the fiscal deficit volatility for the selected countries from south Asia and sub-Saharan Africa. The reason behind the selection of these two regions as study sample is that the countries locating in these regions are subject to high volatile and persistent fiscal deficit (Shaxson, 2005). The study intends to take developing countries facing fiscal deficit from both regions. The present study not only trying to investigate the macroeconomic determinants, but also tried to explore political and institutional determinants of fiscal deficit volatility for two regions.

1.4 Research Gap

Numerous studies have been conducted to investigate the determinants of fiscal deficit for developed and developing nations across the world. Some studies have examined only the impact of macroeconomic variables on fiscal deficit while some studies just focused on political and institutional determinants of fiscal deficit. Limited research work has been done to check the combine impact of political, institutional and macroeconomics variables on fiscal deficit.

The study investigates both economic and political determinants for fiscal deficit, and have tried to answer the question that why some nations in one region face persistent fiscal deficit volatility than other using dummy variable.

1.5 Significance of the Study

Adequate work has been done by different researchers in different countries across the globe as (Murwirapachena et al, 2013), (Hassan & Kalim, 2009), (Mierau et al, 2007), (Edin & Ohlsson, 1990), (Osakwe & Verick, 2007), (Anwar & Ahmad, 2013 and (Woo, 2001) conducted their studies to investigate the factor contributing to fiscal Deficit. However, the literature largely ignored the volatility associated with budget deficit, yet few researchers have investigated volatility like (Eugenia & Mara, 2012), (Javaid et al, 2011) and (Agnello & Sousa, 2007). The present study concerned with the determinants of budget deficit volatility for the selected countries from two different regions south Asia and sub Saharan Africa. Moreover, this study adds the anticipatory effect of macroeconomic economic, political and institutional variables on fiscal deficit volatility to the economic literature. The prominent contribution of this work is to empirically investigate the economic, political and institutional sources of fiscal deficit volatility to highlight the structural and economic characteristics of these two regions.

1.6 Objectives of the Study

The key objectives of the study to empirically analyse the determinants of fiscal budget deficit volatility for the selected South Asian and sub Saharan countries. More specifically, the objectives are:

I. To examine the effect of macroeconomic variables on fiscal deficit volatility in selected South Asian and Sub Saharan African countries.

II. To analyse how political and institutional variables affect fiscal deficit in South Asian and Sub Saharan African countries.

III. To investigate the combine effect of macroeconomic, political and Institutional variables on fiscal deficit in specific South Asia and Sub Saharan Africa countries.

1.7 Organization of the Study

The study grasps five chapters, where chapter 1 have presented background, purpose and significance of study along with the organization of the study complete under the heading of introduction. Chapter two covers review of literature that organizes the theoretical and empirical background of the study around the globe. Chapter three highlights the sample data, the sources from where the data is collected and methodology along with the multiple regression models that are used for estimation. Chapter four presents the results and findings of the regression models. Chapter five provides conclusion of the paper, further it puts a light on recommendations and potentials for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Nations faced persistent deficit in their budget over last thirty years which was a common feature of fiscal behaviour. Besides the cost associated with budget deficit, its volatility is also a crucial problem facing by most of developed and developing nations over the globe. Even though many academics have put a great deal of attention to understand fiscal deficit and its determinants, but surprisingly variability associated with budget deficit did not seriously investigated. This chapter review some of the relevant literature in this area that highlight the efforts of few researchers.

2.2 Economic Determinants of Fiscal Deficit

As study conducted by (Murwirapachena et al, 2013) to evaluate the determinants of fiscal deficit in South Africa, his study objective was to check the impact of economic growth, foreign exchange reserves, unemployment rate, foreign debt and government expenditure on budget deficit. He examined the fact that whether macroeconomic variables are responsible for budget deficit or poor governance in South Africa. Based on his empirical findings foreign exchange reserves has been found the largest determinants of fiscal deficit while overall results show that macroeconomic variables explained partial impact on fiscal deficit, there are other factors too which determine fiscal deficit. In this regard a same study initiated by (Eugenia & Mara, 2012) to explore the sources of budget deficit volatility in old and new EU member states. Accordingly, economic growth rate along with unemployment and debt services significantly affect budget deficit volatility for both old and new EU nations, lower debt to GDP ratio associated with lower budget deficit volatility. In contrast to the findings

of above study (Hayati & Rahman, 2012) explored the relationship between fiscal deficit and economic growth for the Malaysian economy. They did not find any significant relationship between economic growth and fiscal deficit. Their study supports Recardian equivalence hypothesis which claims that there is neutral relationship exist between economic growth and fiscal deficit.

On the other hand, effort done by (Hassan & Kalim, 2009) to study the role of key macroeconomic variable in budget deficit using GMM and Granger causality test. Accordingly, GDP per-capita and M2 money supply are the prominent factor that contribute to the fiscal deficit, because excess money supply M2 helps the government to finance its expenditure. Moreover, volume of trade and debt servicing positively related to fiscal deficit. Whereas study initiated by (Onyango & Ochieg, 2013) that explore the determinants of deficit financing in Kenya. Estimated result shows excess government debt leads to fiscal deficit in Kenya while the major factors that affect fiscal deficit are government revenue, external revenue, debt servicing, and government expenditure.

According to tax smoothing model that tax rate should be approximately constant over business cycle, one can see deficit in recession which remunerated during expansion, when (Barro, 1986 & 1987) test tax smoothing model on more than 200 years of American and British data, his results were very much consistent with the basic principle of tax smoothing model. His empirical findings show that debt to GNP ratio increase during war times due to unexpected government expenditure, decrease during peacetimes and fluctuate over business cycle. Volatility in fiscal deficit can be counter from government revenue and expenditure sides as a relevant study carried out by (Jha, 2010) to evaluate the extent of fiscal situation in south Asia. Empirical findings indicate

that low tax/GDP ratio and inelastic expenditure/GDP ratio lead to structurally fixed fiscal deficit in south Asia.

Following the crises of 1980s most of developed and developing economies around the globe experienced high fiscal deficit which compelled fiscal authorities to bring constructive fiscal adjustment in their policy frameworks in order to restore their economies to the normal state. So investigating the same issue a study conducted by (Koussay and Bohoun, 1993) to examine the determinants of fiscal deficit and fiscal adjustment in COTE D'IVOIRE over the two past decades. COTE D'IVOIRE pursued a wide range of policy reforms supported by the IMF, World Bank and the French international co-operation agency. Reduction in fiscal deficit was of the prime objective in these reforms as government tried some fiscal instruments, cutting public investment and tax rate. However based on the regression analysis government was right in the short run as public investment was positively related to FD while tax revenue was more sensitive to public investment which further results rise fiscal deficit.

On the other hand tax increase can also be used as a policy instrument to whipping out fiscal deficit without recession, as a study done by (Adams, 1988) on the name 'eliminating federal deficit without recession' for United States. Using Warton econometric model shows that tax increase would result some economic slowdown but would not cause recession. Keeping in view the monetary stimulus once the deficit in hand, domestic deficit can be overcome without recession. The study also suggest that fixing the fiscal deficit would not directly related to the international trade differences, which based on other policy measures.

Moreover, most of developing nations in the world experienced persistent deficit due to low quality of exports and high dependency on foreign aid as (Osakwe & Verick,

2007) empirically examine whether current account deficit in sub-Saharan Africa matter or not, they used 38 nations as study sample while classified them into two categories, countries with sustainable and unsustainable deficit. They identified most of Sub-Saharan countries which categorised under persistent current account deficit are due to low quality of exports and huge dependency on foreign aid. Increase in GDP growth, widely democratic regime and trade openness reduce the probability of current account deficit for sub Saharan counties using 5% bench mark.

In addition to GDP per-capita, debt serving, money supply (M2) and forex reserves, inflation also affect fiscal deficit as it creates economic uncertainty along with payment of high interest rates on both internal and external debt over a period of time (Javaid et al, 2011). That's why a study done by (Habibullah et al, 2011) to express long-run relationship between budget deficit and inflation for thirteen Asian countries using error correction model (ECM). Conclusion based on his empirical findings indicate that fiscal deficits are inflationary in selected Asian countries.

Fiscal deficit along with money growth leads to inflation as study by (Yemane & Rufael, 2008) gauge the inflationary consequences of higher deficits and money growth, based on the empirical outcomes, high money growth and fiscal deficit may lead to inflationary pressure. Thus, to insure macroeconomic stability and reduce inflation in the long run, the prime policy objective would be monitoring money supply and reducing budget deficit.

2.3 Political and Institutional Determinants of Fiscal Deficit

In addition to the macroeconomic determinants of fiscal deficit, political and institutional factors are also generate fiscal deficit and its volatility. In the following

section of this chapter we categorised the relevant literature stressed on political and institutional determinants of fiscal deficit and volatility.

A recent study done by (Javaid et al, 2011) to examine the political, institutional and economic determinants of budget deficit volatility for selected south Asian countries and Asean countries. Findings based on the economic determinants indicate that high income, rising inflation and high degree of openness**1** caused fiscal deficit and hence instability in government revenue and expenditure. On the other hand, results based on the political and institutional determinants of budget deficit volatility expressed that political instability, Low democracy, high corruption, inefficient institutional quality and military inclusion in politics lead to high fiscal deficit volatility. Following the previous work by (Javaid et al, 2011) a similar study performed by (Agnello & Sousa, 2007). Based on their findings High political instability leads to high fiscal deficit volatility while Countries with small size characterize with high budget deficit volatility due to uncertainty in their output. In contrast richer nations with high real GDP per capita characterised with stable fiscal deficit.

Therefore, focus on political stability along with institutional reforms and macroeconomic factors may reduce fiscal deficit as (Edin & Ohlsson, 1990) investigate the coalition versus minority effects of political determinants of fiscal deficit, although their study was a modified version of the previous study done by (Roubini & Sachs, 1989). Their Empirical results support that coalition government merely less efficient in fiscal discipline that's why the co-efficient of minority government is positive and statistically significant suggesting that multi-party governments are poor to reduce

1 The ratio of exports plus imports to GDP as an indicator of trade openness

budget deficit due prisoner dilemma**2**. Based on their findings institutional reforms in political system are required to reduce budget deficit and its instability.

In this respect similar study conducted by (Gontila et al, 2013) examine the economic and political determinants of public deficit for 31 developed and developing countries, moreover the study aimed to provide robust conclusion that identify the most significant determinants of budget deficit across these nations. Based on their findings income inequality, cabinet size, centralization of authorities in budgetary decisions and financial depth are found to be most significant determinants of public deficit for the 31 developed and developing nations. Nevertheless, the impact of social polarization**3** is smaller for the nations with the better institutional arrangement. The study argued that better institutional arrangement by using stringent fiscal rule can mitigate public deficit. Moreover, the effect of socio-political variable is smaller for the nation where better institutions exist.

Investigating the same problems, a study conducted by (woo, 2003) to explore the political determinants of fiscal deficit by taking penal sample of 57 developed and developing nations although this study supports the results of previous study. Basic regression and sensitivity analysis are used to find out the most significant and robust determinants of fiscal deficit. Based on his findings financial depth, income inequality, assassination, cabinet size and centralization of authorities in fiscal decision found significantly affect public deficit, however impact of social polarization on budget deficit depends on political and institutional structure of nations. The impact of social

2 (In game theory) a situation in which two players play game, while the action of one player defends on the action taken by its opponent.

3 Refers to the process of isolation within the society that often caused due to income inequality.

polarization is higher in nations where weak institutional framework exist. The author mostly concerned with level of fiscal deficit, however this study explored the sources of fiscal deficit.

Besides financial depth, income inequality and assassination, political fragmentation of governments also determine fiscal deficit. A study carried out by (Elgie & Menamin, 2008) to observe the effect of political fragmentation and political institutionalisation on fiscal deficit using penal data of 34 OECD and non-OECD countries. The size of budget deficit is positively associated with the number of spending ministers and the size of government in legislature. High budget deficits are identified in more fragmented governments of OECD countries, however political fragmentation hypothesis is insignificant for the non-OECD nations. The study finalizes the nations where political institutionalisation exist in the legislature associated with the high budget deficit compared to non-OECD nations. Another study conducted by (Perotti & Kontopoulos, 2001) to investigate fragmented fiscal policy using data of 19 OECD countries. Based on their findings cabinet size in coalition governments along with changing in electoral laws and ideology are the significant determinants of fiscal outcome. They conclude minority governments suffered with higher fiscal deficit because such governments are politically weaker and less able to increase taxes.

Government strength also plays a major role in the determination of fiscal deficit and accumulation of debts as study done by (Kocher & Sutter, 2003) to address the relation of government strength to level of fiscal deficit and debt accumulation using voting power approach to capture government strength and dispersion of power within the government. The weak government hypothesis is tested by measuring the voting power of all parties. They did not find any supportive arguments for the hypothesis that stronger governments characterized with low fiscal deficit and hence less debt

accumulation, moreover Government with high dispersion of voting power associated with low debt accumulation. Because in coalition government equally strong partner may block any supportive outcome by using their veto power.

The above literature review suggests that it would be interesting to investigate the economic, political and institutional factors that are source of budget deficit instability in selected south Asian countries and sub Saharan countries persistently facing high fiscal deficits.

2.4 Conceptual Framework

Different empirical evidences suggested that fiscal deficit is affected by economic and political factors. This study used both macroeconomic and political determinants of fiscal deficit which include foreign debt, trade openness, inflation, real GDP per capita, and political and institutional variables include government stability, socioeconomic conditions, law and order, investment profile, internal conflict, bureaucracy quality, external conflicts, corruption, military in politics, democratic accountability, religious and ethnic tensions. The study is identified how these variables determine fiscal deficit for the selected nations of south Asia and sub Saharan Africa.

2.4 Summary of Literature Review

Title	Author name	Data and time period	methodology	Results/conclusion
The Economic Determinants of Budget Deficits in South Africa	Murwira pachena et al (2013)	This study used time series data from the period 1980 to 2010	Vector auto-regression. Johansen (1991, 1995) co integration technique vector error correction model (VECM)	Impulse response analysis expresses except foreign debt have positive effect on BD. Variance decomposition analysis explain forex reserves the largest component of variation in BD. Study results shows there are other factors which determine BD.
Determinants of fiscal budget volatility in old versus new EU member states	Eugenia and Mara (2012)	The study consider penal data from period 1996 to 2011	Descriptive analysis Correlation	Economic growth rate and unemployment have significant effect on BDV for both old and new member states of EU
The Relationship between Budget Deficit and Economic Growth from Malaysia's Perspective: An ARDL Approach	Hayati & Rahman (2012)	The study used quarterly data of Malaysia for the period 2000-2011	Autoregressive Distributed Lag (ARDL) approach	There is significant long run relationship between productive expenditure and economic growth. The results support the Recardian equivalence hypothesis that claim there is neutral relationship b/w budget deficit and economic growth.
Role of key macroeconomic variables in fiscal deficit	Hassan & Kalim (2009)	The study used time series data for the period 1976 to 2009	GMM technique Modified OLS Error correction mechanism Granger causality test	GDP per capita and M2 significantly affect BD in Pakistan both in short and long run Volume of trade , debt servicing and time trend positively and significantly affect BD in Pakistan
The determinants of deficit financing in Kenya	Onyango & Ochieng (2013)	The study used time series data from 2003-2012	Multiple regression model has been used.	The study suggest that Govt debt positively related to budget deficit. Government revenue, external revenue, debt services and govt expenditure are major determinants of fiscal deficit.
Fiscal Policies and Challenges in South Asia	Jha (2010)	The study used penal data from 1952-1998	Basic regression	The study concludes that lower tax to GDP ratio and inelastic expenditure to GDP lead to structurally entrenched fiscal deficit in south Asia

Current Account Deficits in Sub-Saharan Africa: Do they Matter?	Osakwe and Verick (2007)	The study used panel data for 1970-2005	Probit model has been used.	Increase in GDP growth, widely democratic regime and trade openness reduce the probability of current account deficit for sub Saharan counties using 5% bench mark
Economic, Political and Institutional Determinants of Budget Deficits Volatility in Selected Asian Countries and asean	Javaid et al (2011)	This study used penal data from period 1984 to 2010	Rolling standard deviation. Dynamic penal data model.	Political and institutional variable are directly related to BDV and significantly affect budget deficit volatility compared to economic determinants of BDV.
Budget Deficits and Inflation in Thirteen Asian Developing Countries	Habibullah et al (2011)	The study used annual data for period 1950 to 1999	Co integration and error correction models used. Granger causality tests. ADF test	The Co-integration and ECM express both long run & short run relationships of variables Conclusion based result shows BD deficits are inflationary in selected Asian countries.
Budget Deficits, Money and Inflation: The Case of Ethiopia	Yemane and Rufael (2008)	The study used time series data for 1964 to 2003 for Ethiopia	Co integration and granger causality test	Results show that except money growth fiscal deficit also contributes to the inflationary process of Ethopia.For long run economic stability and to decrease inflationary pressure Ethiopian govt will have to control money growth and narrowing budget deficit
The Determinants of Public Deficit Volatility	Agnello and Sousa (2007)	Penal data has been used for 125 developed and developing nations from 1980 to 2006	GMM model. Sensitivity analysis.	High political instability associated with high fiscal deficit volatility. Countries with the small size characterize with high deficit volatility due to instability in their output.Richer nations with high real GDP per capita associated with stable fiscal deficit.
Political determinants of budget deficits: Coalition effects versus minority effects	Edin and Ohlsson (1990)	The study employs time series cross-section from 1964 to 1985	Pool cross – section time series regression model. Sensitivity analysis	The results showing that minority governments are poor to reduce budget deficit.study suggest institutional reform in politics required to eliminate BD.

Economic and political determinants of public deficits	Gontila et al (2013)	The study used panel data for 1995-2012	Basic regression	Financial depth, income inequality, cabinet size and centralization of authorities in fiscal decision are positively related to public deficit. Public deficit can be mitigated by using stringent fiscal rule in institution.
Economic, political, and institutional determinants of public deficits	Woo (2001)	The study used penal data for the period 1970-1990	Basic regression Sensitivity analysis	Empirical results show financial depth, income inequality, assassination, cabinet size and centralization of authorities in fiscal decision found significantly related to the public deficit. The impact of social polarization is smaller for nations where better institution along with stringent fiscal rule exist.
Political Fragmentation, Fiscal Deficits and Political Institutionalisation.	Elgie and Menamin (2008)	The study used penal data for the period 1975-2004	GMM technique OLS	Budget deficit positively related to number of spending ministers and size of government in legislature.Legislative fractionalisation increase budget deficit in institutionalised democracies.
Fragmented fiscal policy	Perotti and Kontopoulos (2001)	The study used penal data of 19 OCED nations for the period 1979-95	OLS regression	The study suggests that cabinet size in coalition govt along with ideology and changing in electoral laws are Important determinants of fiscal outcome.
Government Strength, Power Dispersion in Governments and Budget Deficits in OECD-Countries.	Kocher & Sutter (2003)	The study used penal data of 22 OECD countries for the period 1979-1999	Banzhaf index Standard deviation of banzhaf index	The study found no supportive arguments for the hypothesis that strong governments have low fiscal deficit and less debt accumulation. Government with high dispersion of voting power associated with low debt accumulation.
Fragmented fiscal policy	Perotti and Kontopoulos (2001)	The study used penal data of 19 OCED nations for the period 1979-95	OLS regression	The study suggests that cabinet size in coalition govt along with ideology and changing in electoral laws are particularly Important determinants of fiscal outcome.

The determinants of fiscal deficit and fiscal Adjustment in COTED'IVOIRE	Kouassy and Bohoun (1993)	The study used time series data from 1965-1989	OLS regression	Results shows cutting public investment lead to shrink fiscal deficit while tax rate is highly sensitive to public investment in the mediam term which result ultimately result increase in fiscal deficit.
Eliminating the federal budget deficit without recession	Adams (1988)	The study used time series data from 1975-1987	Warton econometric model	Result based on empirical finding shows deficit can be overcome by increasing tax which would slow economic activity but would not cause recession.

CHAPTER 3

DATA COLLECTION, VARIABLES EXPLANATION AND ECONOMETRIC METHODOLOGY

This chapter covers data collection, sample that is taken for the research, the sources of data collection, the explanation and particulars of variables and the methodology used for analysis. The chapter is being organized according to the following balance. Section 3.1 data sample and data source. Section 3.2 overviews particulars of variables and explanation of variables. Section 3.3 presents analytical framework. Section 3.4 presents model specification and finally econometric methodology is presented in section 3.5

3.1 Research Design

Research design is defined as investigation`s plan and structure, it also explain the way in which study is put together (Kotzar et al, 2005). The research design explains the relationship between explanatory variables and dependent variables. Research design the structure of the study, it is the glue that all components in the research study has hold (Donald, 2006). According to (Cooper et al, 2003) purpose of specific study is gained by focusing the researcher`s prospective through the research design.

The study have used both fixed effect and random effect model, whereas the selection of appropriate method enables the researcher to analyse their objective tentatively and increased the validity and reliability of the results. This study covers and explains the impact of various explanatory variables on dependent variable.

3.1.1 Sample Design

This dissertation have used panel sample for the period 1990-2016 of selected nations from two different regions south Asia and sub Saharan Africa. However, countries selection are purely based on the availability of data for the said regions. Since due to non- availability of sample data for each nation in the said regions, we have

restricted the study to the selected nations from both regions. According to Hsiao (2003). Panel data have many advantages over cross-section and traditional time series data. As panel data have many data points which provides enough degree of freedom that reduce the chances of endogeneity and multicollinearity among exogenous variables. This also provides efficient parameter estimate. Panel data have larger capability of capturing the complexity of human behaviour than a single cross-section or time series data.

3.1.2 Data Collection

In order to analyse research objective, this research uses secondary data on yearly basis. Secondary data includes annuals reports, published material, public data and information from other sources. According to (Cooper, 2006) secondary data is more useful in quantitative technique to evaluate reports, records, government opinion and government documents etc. This study has employed annual panel data on economic, political and institutional variables. Data on Economic variables have been accessed from WDI (world development indicator) while data on political and institutional variable have been obtained from ICRG (international country risk guide).

3.2 Variables Description

This section covers construction of dependent and independent variables and their description, linkages that determine fiscal deficit and its volatility.

This sub-section indicates macro-economic variables which capture the impact of macroeconomics policies on fiscal deficit.

3.2.1 Budget Deficit

The study has taken budget deficit as dependent variable to count the impact of other explanatory variables. Usually Budget deficit arises when total government expenditure exceeds government revenue excluding borrowing or when a government

fails to raise sufficient revenue through different sources in order to meet its operational current expenditure. Budget deficit measured as a percentage of real GDP for the period 1990-2016 Budget deficit as %

$$= \frac{Government\ total\ expenditure - Government\ Total\ income}{GDP}$$

3.2.2 Budget Deficit Volatility

Moreover, fiscal deficit volatility is defined as a degree of variation between government expenditure and revenue which could be calculated by three moving average standard deviation approach.

$$FDV_{it} = \sqrt{\frac{\sum(FD_{it} - \overline{FD}_{it})^2}{n-1}} \quad \text{.................................... (3.1)}$$

Volatility in fiscal deficit shows unpredictability of government revenue and expenditure and obviously has vital importance for both developed and developing nations across the globe, because it can affect social welfare of nations for the following reasons. First due to instability in government revenue which ultimately force the nations to finance their expenditure by borrowing from both internal and external source which raise high debt to GDP ratio, which may negatively affect a country’s long run sustainability. Therefore, its consequences bear by the future generations of a country. Second they can also increase the level and volatility of inflation especially when there is a lack of independence of central bank (Agnello & Sousa, 2007).

3.2.3 Foreign Debt

Foreign debt is the total amount that a government has borrowed from the rest of world. It has been calculated as ratio of total debt servicing to the real GDP. This

shows if a government is subject to heavy debts burden, then his major part of budget will go into payments of foreign debts along with high interest rate which reduce the efficiency of governments to allocate fund for developmental as well as for non-developmental expenditure. Usually the need of such borrowings occurs when government revenue falls short to meet its expenditure or facing severe budget deficit. Many researchers consider it as a preeminent proxy for instance (Edin & Ohlsson, 1990), (Mierau et al, 2007), (Hassan & Kalim, 2010), (Murwirapachena et al, 2013) and (Onyango & Ochieng, 2013) to check its impact on fiscal deficit in their studies.

Data regarding this variable is taken from WDI of each nation. The time period covered under this study is 1990 to 2016. Due to missing values there is unbalance panel data.

3.2.4 Trade Openness

Trade openness is measured as degree of ratio of exports plus imports to the GDP. The economies with the high degree of openness are more exposed to external shock, therefore positive coefficient is expected. Volume of trade as ratio of GDP usually has negative effect on budget deficit volatility especially for a nation where exports are greater than its imports. On the contrary trade volume is likely to be positively related to budget deficit and its volatility where imports payments are in excess of exports receipt (Javaid et al, 2010). As the government have to pay more foreign exchange on imports than his receipts received from exports which ultimately force the nations to raise finance by borrowing using both internal and external sources. Trade openness or trade volume as a contributing factor to the fiscal deficit has been used by (Javaid et al, 2010), (Hassan & Kalim, 2010), (Kiprop & Kibet, 2013) and (Agnello & Sousa, 2007) in their studies.

$$Trade\ openness = \frac{Imports + exports\ (both\ goods\ and\ services)}{GDP}$$

3.2.5 Inflation

Inflation refers to the persistent increase in general price level over time as it has been included to account economic uncertainty. Inflation can affect fiscal deficit through various channels as economic uncertainty causes instability in government expenditure and tax revenue which further affect budget deficit volatility. The reason to include this variable is to test the prediction that higher level of inflation associates with high fiscal deficit volatility as High inflation leads to increase nominal interest rate which further shake fiscal deficit through payments of high interest rates on both internal and external debts that's why it is expected to have positive sign with its coefficient, moreover it makes difficult for authorities to formulate fiscal policy during economic uncertainty. Recent studies conducted by (Kiprop & Kibet, 2014), (Eugenia & Mara, 2012), (Javaid et al, 2010), (Agnello & Sousa, 2007), (Mierau et al, 2004), (Habibullah et al, 2000) and (Woo, 1991) have employed this variable as a factor of fiscal deficit in their studies. Inflation have been measured by following formula.

$$\text{Inflation rates (IR)} = (I_{t-1} - 1_t) / I_{t-1}$$

3.2.6 Real GDP per-capita

Real GDP per-capita has been obtained by dividing GDP (gross domestic product) on population. The inclusion of this variable in the model to capture the differences in the level of economic development among nations in these two regions (south Asia and Sub-saharan). The evidence provided by (Osakwe & Verick, 2007) show that there is positive relationship between real GDP per-capita and budget deficit volatility. Higher GDP per-capita associated with high fiscal deficit volatility because a benevolent government incur high expenditure on public works program to

maximize social welfare in the society. On the other hand countries with low real GDP per-capita characterized with shorter and more volatile business cycle due to weak economic institutions and less developed financial markets (Fatas & Mohov, 2006).

$$Real\ GDP\ per-capita = \frac{Real\ GDP}{Total\ population}$$

3.2.7 Institutional and Political Variable

To examine the effect of Political and institutional variables on fiscal deficit volatility, the study uses political instability index constructed in ICRG (international country risk data guide) by assigning risk points to political risk components that include government stability, investment profile, internal conflict, socioeconomic conditions, external conflict, corruption, military in politics, law and order, democratic accountability, bureaucracy quality, religion and ethnic tensions.

Table 3.1: Summary of Macroeconomic, Institutional and Political Variables and Measurement

Variables	Description/ Proxy	Expected Effect	Research Support	Data Source
Foreign debt	External debt (% of GNI)	Positive	Murwirapachena et al (2013)	WDI
Trade openness	$= \frac{Imports + exports\ (both\ go}{GDP}$	Positive/negative	Hassan and Kalim (2009)	WDI
Inflation	(IR) = ($I_{t-1} - 1_t$) / I_{t-1}	Positive	Eugenia and Mara (2012)	WDI
Real GDP per-capita	$Real\ GDP\ per - capita = \frac{Real\ GDP}{Total\ population}$	Positive	Javaid et al, 2011	WDI
Bureaucracy Quality	Measured institutional strength	Negative	(Edin & Ohlsson 1990)	T & S political index
External Conflict	war, cross border conflicts and foreign pressure	Negative (Expected)	Javaid et al, 2011	ICRG
Corruption	patronage, nepotism, job reservations, secret party funding	Positive	Kiprop and Kibet (2013)	ICRG
Military In Politics	Measured as military takeover and their participation in politics	Positive	Javaid et al, 2011	ICRG
Democratic Accountability	Government responsiveness to its people	Negative	Kiprop and Kibet	ICRG
Religious Tensions	Domination of a single religious group over the society	Positive	Javaid et al, 2011	ICRG
Ethnic Tensions	racial, nationality, or language divisions	Positive	Javaid et al, 2011	ICRG
Government Stability	Legislative strength, government unity, an popular support	Positive	(Woo, 2003)	ICRG
Socioeconomic Conditions	socioeconomic pressure at work	Negative	(Woo,2003)	ICRG
Law and Order	Strength And Fairness of Legal System, Observance of Law	Negative	(Javaid et al, 2011)	ICRG
Investment Profile	Risk to Investment, , Contract viability, Payments delays and profit repatriation	Negative	Javaid et al, 2011	ICRG
Internal Conflict	political violence	Positive	Gontila et al	ICRG

3.3 Analytical Framework

The main objective of this study is to investigate the determinants of fiscal deficit as well as their impact on fiscal deficit volatility. Therefore, this study has set of empirical models that are based on theoretical background and set of econometric techniques to estimate these models.

3.4 Model Specification

This study considers 16 explanatory variables which vary across the group (cross sectional). For this form of analysis panel data methodology is used. Panel data propose more effective information by joining time series and cross sectional observations, panel data also gives more degree of freedom, extra variability and less multi-collinearity among variables. Panel data gives more comprehensive empirical results and analysis as compare to time series and cross sectional data. Therefore to estimate the determinants of fiscal budget deficit volatility the present study based on dynamic panel data models for standard deviation of fiscal deficit. This model deals with the introduction of lag dependent variable in the system of equation to control dynamics of the process and to capture persistence in fiscal deficit volatility. Based on the same model recent studies conducted by many researchers, for instance (Javaid et al, 2011) and (Agnello & Sousa, 2007) have also followed this approach to investigate the same problem. Moreover (woo, 2003) and (Henisz, 2004) also follow this models to empirically investigate the impact of political and institutional variable on budget deficit. The following specification based on linear panel data model to examine major sources of fiscal deficit volatility.

$$FDV_{it} = \beta FDV_{it-1} + \beta' s\ ECON_{it} + \gamma' s\ INST_{it} + \delta C_{it} + v_{it} + \epsilon_{it} \ \ldots\ldots \ (3.2)$$

(General equation)

Where

FDV_{it} = is the logarithm of fiscal deficit volatility for ith country of time period t.

FDV_{it-1} = is the log of lag dependent variable of budget deficit volatility

$ECON_{it}$ = is the vector of macroeconomic variable of ith countries for the time period t

$INST_{it}$ = is the vector of political and institutional variables of ith countries for the time period t

C_{it} = is the set of control variable

v_{it} = fixed effect of ith country in time period t

ϵ_{it} = stands for i.i.d error term

Where $v_{it} = \delta_i + \mu_{it}$

Since FDV_{it} depends on unobservable time invariant individual effect δ_i that's why its lag variable FDV_{it-1} is also correlates with δ_i. This means FDV_{it-1} is endogenous and we will face so-called dynamic panel data bias when estimating coefficient using OLS technique. The co efficient may be upward or downward biased depending on the relationship between lag dependent variable FDV_{it-1} and δ_i. The coefficient will be upward biased if the two regressors are positively related to each other.

To remove country specific or any time invariant country specific variable and endogeneity that may be due to the correlation between FDV_{it-1} and v_{it}, (Arellano and Bond, 1991) developed GMM technique. Whereas, first differencing remove v_{it} country specific effect and produce the equation that may be estimated for explanatory variables.

$$\Delta FDV_{ti} = \Delta\beta_o FDV_{it-1} + \Delta\,\beta' s\; ECON_{it} + \Delta\gamma' s\; INST_{it} + \Delta\delta C_{it} + \Delta\epsilon_{it} \ldots 3.3$$

Where $i = 1 \ldots\ldots, N$, $t = 1, \ldots\ldots\ldots T_i$

To control country specific demographic characteristics the study intends to incorporate $\boldsymbol{C_{it}}$ variable in equation which may relate to fiscal deficit volatility. While $\boldsymbol{\beta_i, \gamma_i, \delta_i}$ are the parameter to be estimate using GMM technique.

3.5 Econometric Methodology

3.5.1 Types of Panel Models

There are various types of panel data estimation techniques like pooled OLS, Fixed effect model and Random effect model, IVLS, PCSE, FGLS and GMM etc.

3.5.2 Estimation Technique

Since our study based on annual panel data which has time series dimension that's why we have the estimation technique that is best and frequently used for the panel data. Most commonly used models fixed effects model (FEM), random effects model (REM) and pooled OLS are used to estimate the coefficients of variables. However, the problem associates with these methods is that they cannot provide efficient and consistent estimate in the presence of potential endogeneity caused by reverse causality. So, in such a situation the best available option is to move towards the Two Stage Least Square (2SLS) technique. However, in the presence of the

heteroscedasticity the 2SLS does not provide efficient estimates, and this could obviously suspect the significance pattern of the parameters estimates. Furthermore, the 2SLS is a static technique where we could not include the lag of the dependent variable as a regressor to correct the problem of autocorrelation.

A prominent econometric technique to avoid the aforesaid problem of endogeneity, reverse causality, heteroscedasticity and autocorrelation is Generalized Method of Moment (GMM). GMM is the extension Of Instrumental Variable (IV) technique. The Basic advantage of GMM approach is that the model to be estimated is not necessarily to be homoscedastic and serially independent (Blundell and Bond, 1999). Thus GMM produce consistent and efficient estimates even in the presence of heteroscedasticity (Perera and Lee, 2013). For dynamic panel data modelling, GMM has mainly been used by (Arellano and Bond, 1991), then by (Arellano and Bover, 1996) and later on, (Blundell and Bond, 1999) specifically used GMM to cope the problem of endogeneity in the production function. In order to avoid problem of endogeneity and reverse causality, this study favours to use system GMM technique.

CHAPTER 4

EMPIRICAL RESULTS AND DISCUSSIONS

This research is carried out to investigate the determinants of fiscal deficit volatility as well as the combine effect of macroeconomic, political and institutional variables in order to analyse their anticipated effect on fiscal deficit volatility for the sub-Saharan and south Asian regions.

This chapter covers the following sections. Sections 4.1 deals with the descriptive statistics analysis, Section 4.2 deals with correlation matrix, Section 4.3 covers test for heterogeneity cross section and time period wise. Section 4.5 describe estimation results and discussion.

4.1 Descriptive Statistics Analysis

The descriptive statistics consists of macroeconomic, political and institutional variables used in this research from ICRG data for the period 1990-2016 is presented in table 4.1.

Table 4.1: Summary Statistics

Variable	*Observation*	*Mean*	*Std. dev*	*Min*	*Max*
LFDV	*351*	*7.000000*	*3.746999*	*1.0*	*13.0*
GST	*351*	*7.662393*	*2.174005*	*1.6*	*11.1*
SEC	*351*	*4.023077*	*1.50927*	*0.5*	*7.00*
IPL	*351*	*6.877778*	*2.226237*	*1.0*	*11.5*
ITC	*351*	*7.961823*	*2.234565*	*0.0*	*12.0*
ETC	*351*	*9.635613*	*1.653727*	*3.8*	*12.0*
CPN	*351*	*2.568376*	*.9906693*	*0.0*	*5.00*
MIP	*351*	*3.163818*	*1.536629*	*0.0*	*6.00*
RLT	*351*	*3.926781*	*1.377211*	*1.0*	*6.00*
LAO	*351*	*2.979487*	*1.023122*	*0.0*	*5.00*
ETN	*351*	*3.034473*	*1.174214*	*0.0*	*5.00*
DAT	*351*	*3.490028*	*1.276396*	*0.0*	*6.30*
BQT	*351*	*1.815385*	*..7395306*	*0.0*	*4.00*

The log fiscal deficit volatility has a mean value of 7 with a standard deviation 3.7469 shows that fiscal deficit volatility deviating from the mean by 3.746 which means the countries locating in these two regions not only facing fiscal deficit but also deviation exist in fiscal deficit among these nations. Furthermore its value ranges from 1 to 13. Government stability has a mean value 7.662 and standard deviation 2.174 and its minimum value 1.64 and maximum 11.08. The mean value for socio economic condition is 4.023 with standard deviation 1.509 and it ranges from .5 to 7. Other variables of this study are summarized as well in Table 4.1 which determine fiscal deficit and its volatility. The others covariates are investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability and bureaucracy quality.

4.2 Correlation Matrix

To check the existence of multi-collinearity in the model shows correlations between independent variables which introduce a problem because the estimates of parameters becomes inefficient and shows large standard errors. The results then make the coefficient values and signs unreliable. In addition, multiple independent variables with high correlation add no additional information to the model. It also conceals the real impact of each variable on the dependent variable (Anderson et al, 2008). (Hair et al, 2006) argued that correlation coefficient below 0.9 may not cause serious multicollinearity problem. In addition, (Malhotra, 2007) stated that multicollinearity problems exists when the correlation coefficient among variables should be greater than 0.75. Hence, Correlation of each variable with itself gives the value of 1. The higher values indicate higher correlation the lower value specifies lower correlation. Table 4.2 shows the correlation matrix is not high, so there is no problem of multi-collinearity among the covariates.

Table 4.2: Correlation Matrix of Variables

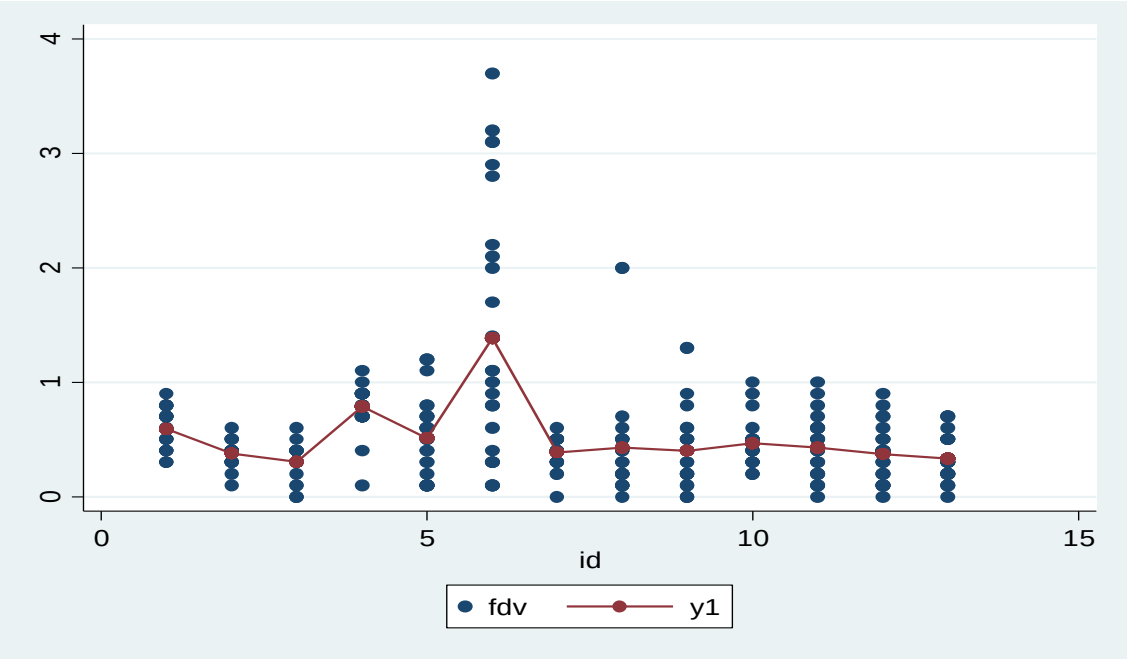
	LFDV	*GST*	*SEC*	*IPL*	*ITC*	*ETC*	*CPN*	*MIP*	*RLT*	*LAO*	*ETN*	*DAT*	*BQT*
LFDV	***1***												
GST	***0.1806***	***1***											
SEC	***0.2432***	***-0.1214***	***1***										
IPL	***0.2581***	***0.4022***	***0.1575***	***1***									
ITC	***0.1284***	***0.2838***	***0.0276***	***0.3675***	***1***								
ETC	***0.0936***	***0.2470***	***0.0302***	***0.3239***	***0.5555***	***1***							
CPN	***0.2226***	***-0.0777***	***0.5354***	***0.2595***	***0.1220***	***0.2549***	***1***						
MIP	***0.2481***	***0.0878***	***0.1768***	***0.3873***	***0.3951***	***0.2406***	***0.2792***	***1***					
RLT	***0.0347***	***-0.0521***	***-0.0514***	***0.0521***	***0.2263***	***0.2373***	***0.3120***	***0.3402***	***1***				
LAO	***0.1917***	***0.2955***	***0.2502***	***0.1861***	***0.4487***	***0.3208***	***0.1555***	***0.3070***	***0.0175***	***1***			
ETN	***0.2007***	***0.2607***	***0.0757***	***0.1605***	***0.4361***	***0.3174***	***0.0776***	***0.2489***	***0.3501***	***0.5194***	***1***		
DAT	***0.0261***	***0.0799***	***0.0148***	***0.4332***	***0.1768***	***0.2994***	***0.3109***	***0.3735***	***0.0299***	***0.1925***	***-0.0770***	***1***	
BQT	***0.1327***	***-0.1551***	***0.3396***	***0.0315***	***-0.0229***	***-0.0841***	***0.2294***	***0.3567***	***0.2768***	***0.0033***	***-0.1000***	***0.274***	***1***

Table 4.2 expresses the correlation matrix which counts the linear relationship among explanatory variables used in this study. The results indicate that for most of variables the correlation coefficient is less than 0.5 showing that there is no such sever multi-collinearity problem exist among explanatory variables. As (Malhotra, 2007) identified that multi-collinearity problems can be serious when the correlation coefficient among variables is greater than 0.75. Moreover the correlation matrix for macro variables are in appendix where there is no multi-collinearity problem.

4.3 Test of Heterogeneity (Cross Section)

Below graph shows the visual inspection of cross sectional heterogeneity analysis over the group (Cross sections) of selected nations from sub Saharan and south Asian regions. The med line shows mean value of fiscal deficit while blue dots shows the fiscal deficit of each nations. Although the data has outlier as we can see in the middle of the above graph. Ups and downs movement of med line shows that there exist cross sectional heterogeneity at some level but on average cross sectional heterogeneity is minor. If the line is straight then there is not cross sectional heterogeneity. Since we have thirteen different nations from these two regions, so as a result on average size of fiscal deficit is different in each country from others but at minor level.

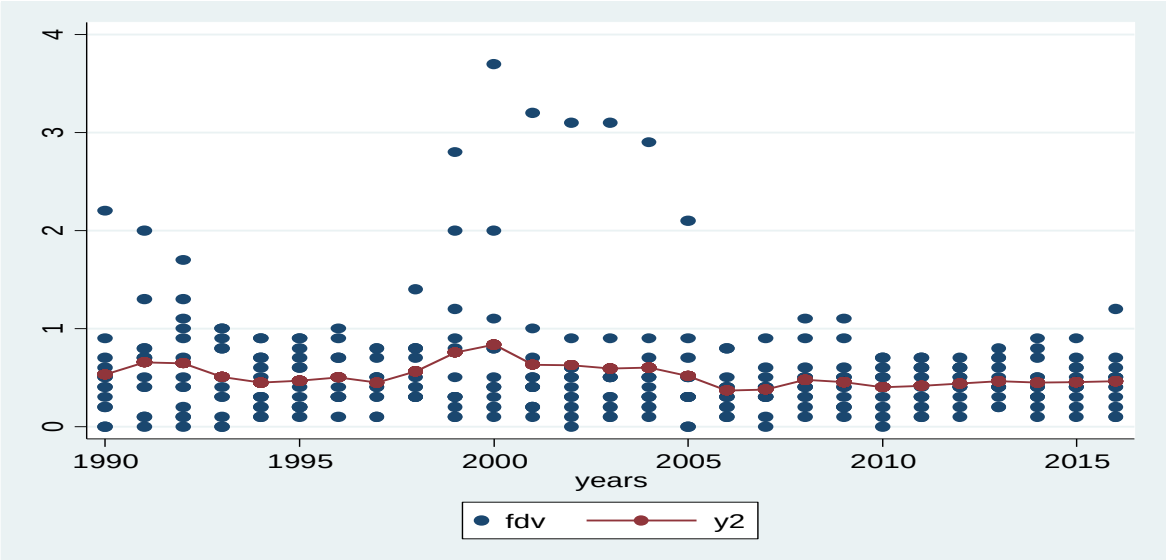
4.1: Graph Shows Heterogeneity (Cross section)



4.4 Test of Heterogeneity (Overtime)

Now, we have checked Heterogeneity over a period of time. There is possibility that every nation may face different fiscal deficit over different period of time. The above graph shows that on average nations from both regions may face different fiscal deficit over different period of time.

4.2: Graph shows Heterogeneity (Over Time Period)



4.5 Tests for the Detection of Hetroscedasticity and Endogeniety

Pre estimation of the models various diagnostic tests are performed on the data shown in table 4.3. The result for white test shows that there is heteoskedasticity problem in the data. The P value is 0.020 is far less than 5% level of significance which represent that we reject our null hypothesis and don not reject alternative. Thus there is heteroskedasticity problem in the data.

. Furthermore to inspect endogeniety problem which may occurs due the correlation between explanatory variable and residual error term we used Sargan test. The null hypothesis states the instruments are exogenous while the alternative hypothesis states that the instruments are endogenous. Result based on p-value is 0.000 which is less than 5% level of significance showing that the instrumental variables are endogenous.

Table 4.3: Heteroscedasticity and Endogeniety Tests

Tests	Tests Results	Hypothesis
White Test	Prob>Chi2 = (0.020)	H0: Homoscedastic H1: Heteroskedastic
Sargan test for (Endogenity)	P > Chi2 = (0.000)	H0: Exogenous H1: Endogenous

4.6 Estimation Results and Discussions

This section covers the empirical analysis of macroeconomic, political and institutional variables on fiscal deficit volatility. The variables in models are classified according to the following sequence. Section 4.6.1 describe model 01 and 02 which analyse the effect of macroeconomic variable on fiscal deficit volatility for overall sample and for region's specific. Section 4.6.2 shows the anticipatory effect of political and institutional determinant on fiscal deficit volatility for region's specific and for over

all sample in model 03 and 04 respectively. Finally in Section 4.6.3 in model 05 the study analysed the combine effect of macroeconomic, political and institutional variable on fiscal deficit volatility.

4.6.1 Effect of Macroeconomic Variables on Fiscal Deficit Volatility

To investigate the effect of macroeconomic variables on fiscal deficit, the following results associated with macroeconomic variables are given in table 4.4. We did some econometric data tests pre-estimating models using GMM techniques.

4.6.1.1 Macroeconomic variables Model 01

The results shows that the coefficient value of lag fiscal deficit volatility is positive and significant at 5% indicating that there is smooth budgetary process and spill over of fiscal deficit volatility to the next year. The coefficient of foreign debt is positive and significant at 5% level of significance shows that when foreign debts rise by 1% then brings 23% increase in fiscal deficit volatility because foreign debts and fiscal deficit are positively related to each other. This shows if a government faces heavy debts servicing, then his major part of revenue may goes into repayments of debts along with high interest rate. Which resultantly reduce government's efficiency to allocate funds for developmental as well as for non-developmental expenditure. To fill the gap between government revenue and expenditure both developed and developing nations approach to international financial institutions like IMF, World Bank and ADB (Asian Development bank) etc. The result consistent with the previous studies done by (Edin & Ohlsson, 1990), (Mierau et al, 2007), (Hassan & Kalim, 2010). The coefficient of population growth is significant at 5%. The negative sign with the coefficient of population growth indicates that higher the population less will be the fiscal deficit and its volatility. Inflation is statistically and positively significant at 5% as increase in inflation by 1% brings 13% rise in fiscal deficit volatility because rising inflation leads to economic uncertainty which brings instability in government's tax revenue and expenditure. High inflation leads to increase nominal interest rate which raise fiscal

deficit and its volatility through payments of high interest rates on both internal and external debts. The result also supported by (Eugenia & Mara, 2012), (Javaid et al, 2010), (Agnello & Sousa, 2007). The estimated result based on real GDP per capita shows positive relationship with fiscal deficit volatility. The coefficient of real GDP per capita is also statistically significant at 5% level of significance indicating 1% increase real GDP per capita raise fiscal deficit volatility by 15%. The economic rationale behind positive sign of the coefficient is countries with high real GDP per capita have more instability in their budget deficit because benevolent governments mostly incur higher expenditure on social welfare to function the society. The result is consistent with the recent studies conducted by (Woo, 2003), (Fatas and Mihov, 2010).

Trade openness is also positive and statistically significant at 5% level of significance. The economies with the high degree of openness are more exposed to external shock, therefore positive coefficient associated with this variable. Volume of trade as ratio of GDP usually has negative effect on budget deficit volatility especially for a nation where exports are greater than its imports. On the contrary trade openness is likely to be positively related to budget deficit and its volatility for a nation where imports payments are in excess of exports receipt (Javaid et al, 2010). That budget deficit volatility increases as the degree of openness to GDP increases exposure of more external shocks which make the budget deficit more volatile. External shocks can be source of fiscal instability especially in developing countries. (Hassan and Klim, 2009) investigate that changes in the prices of export and import may also affect current account balance either through profits from exports or through high imports tariffs. (Agnello and Sausa, 2009) and (Fatas and Mahov, 2010) also come up with the same idea that high degree of openness is positively associated with budget deficit volatility. The Arellano-Bond AR (2) test for model 02 is 0.835 which is high enough, presenting that we cannot reject the null hypothesis and concludes the instruments are valid. Moreover null hypothesis based on Hansen test states the instruments as group are exogenous. Reported chi-square value for Hansen test is 0.249 showing that instruments

as a group are exogenous. This study supports the previous literature empirical results (Gontila et al, 2013) and (Javaid et al, 2011).

Table 4.4: Effect of Macroeconomic Variables on Fiscal Deficit Volatility (full sample): Dependent Variable is Log Fiscal Deficit Volatility

Variables	Mod1	Mod2
Intercept	0.663	0.671*
	(0.081)	(0.0851)
Lag Deficit volatility	0.181**	0.121**
	(0.0431)	(0.0523)
Foreign	0.239*	0.245*
Debt	(0.0161)	(0.0173)
Population growth	-0.170**	-0.164
	(0.0432)	(0.0323)
Inflation	0.131**	0.153
	(.0341)	(0.1651)
Real GDP per-capita	0.154**	0.174**
	(0.0491)	(0.0540)
Trade Openness	0.140**	0.172**
	(0.0811)	(0.0393)
South Asian dummy		0.421*
		(0.0143)
Arellano- Bond AR (2)	0.835	0.855
Hansen test	0.249	0.279
No of observation	351	351

- *GMM estimates.*
- *Arellano- Bond AR (2) test is for instruments validity under the null hypothesis that instruments are valid.*
- *Hansen test used for exogeneity under the null hypothesis that instrument as a group are exogenous.*
- *Statistical significance at 1%, 5% and 10% are denote by *, ** and *** respectively.*

4.6.1.2 Macroeconomic Variables with Dummy for Regional Differences Model 02:

In model 01 we explored the macroeconomic determinants of fiscal deficit instability for overall sample, now in model 02 we have tried to split the sample by including dummy variable to capture regional differences by assigning 1 for south Asia and zero for Sub-Saharan Africa. It shows south Asian region experiences less fiscal deficit volatility compared to sub Saharan region. Results based on model 02 indicate

that all the coefficients of macroeconomic variables are highly significant except inflation which comes insignificant. The reason behind that is most of sub Saharan nations shows downward trend in CPI from 1998-2016. Moreover, Most of African nations are facing twin deficits (both current account and fiscal deficit) as a number of sub Saharan countries like Angola, Botswana, Burkina Faso, and Cameroon have been on occasions in this situation. (Osakwe & Verick, 2007) have also come up with same conclusion. The Arellano-Bond AR (2) test for model 02 is 0.855 which is high enough, presenting that we cannot reject the null hypothesis and concludes the instruments are valid. Moreover null hypothesis based on Hansen test states the instruments as group are exogenous. Reported chi-square value for Hansen test is 0.279 showing that instruments as a group are exogenous. This result is consistent with (Gontila et al, 2013)

4.6.2 Effect of Political and Institutional Variables on Fiscal Deficit Volatility

In the previous models we have checked the anticipated effect of macroeconomic variables on fiscal deficit. To broaden the analysis we include political and institutional variables in model 03. Political economic theory claimed fiscal policy depends upon political and institutional environment of a country (Alesina and Perotti, 1995). Governments mostly face constraints in implementing fiscal policies, where increasing military role in politics, low bureaucratic quality and political instability exist (Javaid et al, 2011)

4.6.2.1 Political and Institutional Variables Model 03:

The results of political and institutional variables are illustrated in table 4.5 indicate political and institutional variables are related to fiscal deficit volatility. The coefficient of bureaucratic quality is negative and statistically significant at 5% level of significance.

Table 4.5: Impact of Political and Institutional Variables on Fiscal Deficit Volatility (full sample): Dependent Variable is Log Fiscal Deficit Volatility

Variables	Mod3	Mod4
Intercept	*0.128*	*0.134*
	(0.02071)	*(0.02171)*
Lag Deficit volatility	*0.161***	*0.153***
	(0.0331)	*(0.04212)*
Bureaucracy Quality	*-0.490***	*- 0.410***
	(0.11297)	*(0.1249)*
Democratic Accountability	*-0.214**	*0.228**
	(0.0257)	*(0.0248)*
Government Stability	*-0.115**	*-0.135**
	(0.0145)	*(0.01751)*
Corruption	*0.322**	*0.352**
	(0.0236)	*(0.04513)*
Military in Politics	*0.264***	*0.296**
	(0.0754)	*(0.07214)*
Law and Order	*0.275**	*0.281***
	(0.0374)	*(0.0484)*
Investment Profile	*-0.166*	*-0.229**
	(0.1345)	*(0.22451)*
Socioeconomic Conditions	*-0.286***	*-0.326***
	(0.05861)	*(0.0618)*
External Conflicts	*0.120**	*0.152**
	(0.0434)	*(.01543)*
Internal Conflicts	*0.275**	*0.281**
	(0.03742)	*(0.03742)*
Religious Tensions	*0.329****	*0.346***
	(0.1317)	*(0.06147)*
Population Growth	*-0.267***	*-0.352***
	(0.0764)	*(0.0796)*
Ethnic Tensions	*0.146***	*0.174***
	(0.0342)	*(0.0426)*
Dummy variable		*-0.562**
		(0.0621)
Arellano- Bond AR (2) (P-value)	*0.627*	*0.673*
Sargan test of overid: restrictions (P-value)	*0.212*	*0.225*
No of observation	*351*	*351*

- GMM estimates.
- Arellano- Bond AR (2) test is for instruments validity under the null hypothesis that instruments are valid.
- Hansen test used for exogeneity under the null hypothesis that instrument as a group are exogenous.
- Statistical significance at 1%, 5% and 10% are denote by *, ** and *** respectively.

The negative sign with coefficient supporting the fact that high bureaucratic quality leads to low fiscal deficit instability because the governments with better and independent public administration provide desired environment to fiscal policy which cause less fiscal deficit volatility. In addition to bureaucratic quality, the coefficient associated with democratic accountability is also highly significant at 1% level. Low

democratic accountability associated with high fiscal deficit volatility exist. The results also consistent with the previous studies done by (woo, 2003) and (Javaid et al, 2011). The developing countries where genuine mechanism for democratic accountability not exist are characterized with incredible political parties, faulty elections and weak parliaments which is unable to play their democratic role at the best interest of their citizens (Jelmin, 2011). Similarly government stability along with military interference in politics and high corruption are found significant at 1% and 5% level respectively. A government where such a system prevails that less military interference in politics, less corruption and better stability condition may face low constraints in implementing fiscal policy which eventually reduce fiscal deficit and its volatility. Developing countries mostly run pro-cyclical fiscal policy due to high level of corruption in their institutions (Alesina and Tabellini, 2008). The results are consistent with findings of (Alesina and Tabellini, 2008) and (Javaid et al, 2011) (Agnello and Sousa, 2007).

Better law and order situation, improved socioeconomic condition and less conflicts (internal and external) lead to reduction in fiscal deficit volatility. On the other hand worse socioeconomic condition along with weak law and order situation cause political instability which indirectly raise fiscal deficit volatility. Based on the results presented in model 03 the coefficient of law and order and conflicts are statistically significant at 1%, while the coefficients of socioeconomic condition is significant at 5% level. The results are also consistent with the recent studies of (Alesina and Tabellini, 2008) and (Javaid et al, 2011). We have taken population growth as control variable which shows significant and negative effect on fiscal deficit volatility. Furthermore coefficients linked with religious and ethnic tensions are reported statistically significant at 5% respectively. (Basedau, 2001) examined in his study that eight out of ten armed conflicts took place in Sub-Saharan Africa which have a religious dimension.

The study performed pre-estimation tests to check the validity and exogienity of instrumental variables. Arellano-Bond AR (2) test has been used to check whether the instruments included in model 03 are valid or not. Based on the results the estimated value for Arellano-Bond AR (2) test is 0.627 which is high, supporting the null hypothesis that the instruments are valid and in the same way Hansen test of over identifying restrictions also being employed. Estimated p-value for Hansen test is 0.212 which is high enough shows that instruments as group are exogenous.

4.6.2.2 Political and Institutional Variables with Regional Dummy Model 04:

As in model 03 we checked general impact of political and institutional variables on fiscal deficit, now in model 04 we insert dummy variable to investigate regional specific determinants of fiscal deficit volatility by assign value 1 for South Asian countries and zero for Sub Saharan African countries. Expected negative sign with coefficient of south Asian dummy indicates that countries in south Asian have less fiscal deficit instability. The result also supported by (Fatas and Mihov, 2010).

4.6.3 Combine Effect of Macroeconomic Political and Institutional Variables on Fiscal Deficit Volatility Model 05.

In previous sections 4.6.1 and 4.6.2 we separately analyse the possible effect of macroeconomic, political and institutional variable on fiscal deficit and its instability, whereas in this section we have tried to check the combine impact of macroeconomic, political and institutional variables on fiscal deficit volatility. Moreover all the variables are significant except Investment profile, and inflation are insignificant. According to WDI report for Sub Saharan nations, inflation rate showed downward trend from last 1998 to 2016.

Table 4.6: Combine Impact of macroeconomic, political and institutional variables on fiscal deficit volatility (full sample): Dependent Variable is Log fiscal deficit volatility

Variables	*Coefficient*	*Standard error*	*P values*
Intercept	*0.663*	*(0.0811)*	*0.0450*
Lag Deficit volatility	*0.167***	*(0.0421)*	*0.0302*
Foreign Debt	*0.258**	*(0.0331)*	*0.0001*
Inflation	*0.161*	*(0.1154)*	*0.1372*
Real GDP per-capita	*0.174***	*(0.0151)*	*0.0036*
Trade Openness	*-0.154***	*(0.0428)*	*0.0043*
South Asian dummy	*0.543***	*(0.0847)*	*0.0463*
Bureaucracy Quality	*-0.332***	*(0.0521)*	*0.0031*
Democratic Accountability	*-0.115**	*(0.0122)*	*0.0003*
Government Stability	*-0.364***	*(0.0663)*	*0.0362*
Corruption	*0.214***	*(0.0431)*	*0.0421*
Military in Politics	*0.341***	*(0.0681)*	*0.0211*
Law and Order	*0.123**	*(0.0128)*	*0.0002*
Investment Profile	*-0.324*	*(0.2516)*	*0.1432*
Socioeconomic Conditions	*-0.114****	*(0.0434)*	*0.0742*
External Conflicts	*0.132***	*(0.0281)*	*0.0421*
Internal Conflicts	*0.231***	*(0.0352)*	*0.0242*
Religious Tensions	*0.132***	*(0.0243)*	*0.0321*
Ethnic Tensions	*0.151****	*(0.0458)*	*0.0642*
South Asian dummy	*0.523***	*(0.1241)*	*0.0211*
Arellano- Bond AR (2) (P-value)	*0.723*		
Sargan test	*0.311*		
No of observation	*351*		

- ***GMM estimates***
- ***Arellano- Bond AR (2) test is for instruments validity under the null hypothesis that instruments are valid.***
- ***Hansen test used for exogeneity under the null hypothesis that instrument as a group are exogenous.***
- ***Statistical significance at 1%, 5% and 10% are denote by *, ** and *** respectively.***

Moreover all the political, institutional and macroeconomic variables are statistically significant supporting the fact that political instability along with weak institutional framework and worse economic situation lead to structurally fixed fiscal

deficit volatility. In model 05 we also have included dummy variable to capture region's differences. Coefficient associated with regional dummy shows similar result as in model 02, 04, are described which indicate that south Asian regions has less fiscal deficit volatility. Furthermore, Arellano-Bond AR (2) and Hansen tests check the validity and exogenity of instruments. Reported value for Arellano-Bond AR (2) and Hansen tests are 0.723 and 0.311 which are enough high indicating that the instruments are valid and as group are exogenous.

CHAPTER 5

SUMMARY AND CONCLUSION

The objective of this study is to empirically explore the determinants of fiscal budget deficit volatility of selected south Asian and sub Saharan countries using panel data from 1990-2016. To overcome endogeneity problem the study used Generalised Method of Moment (GMM) estimation technique to estimate the coefficient of variables. Initially we took data on different variables for 13 nations from the two regions south Asia and Sub Saharan Africa. As we have mentioned in beginning that sample selection is purely based on availability of data. Moreover we measured volatility of fiscal deficit using three year moving average standard deviation approach. Before doing so the study used graphic representation to visually inspect hetrogenity in fiscal deficit at both cross sectional and time period base. The study also performed different tests for the detection of hetroscadasticity and endogeniety which may frequently occur in panel data analysis. The determinants of fiscal budget deficit volatility are estimated using generalized method of Moments of (Blundell and Bond, 1998) that allows to deal with country unobservable specific effect and any endogeneity problem that may be due to the correlation between country specific effect and dependent variable.

Results based on macroeconomic variables show that high inflation rate, greater openness (especially a nation where imports are greater than exports) high debts to GDP ratio and low real GDP per capita significantly affect fiscal deficit volatility as a previous study conducted by (Osakwe & Verick, 2007) found real GDP per capita has relationship with fiscal deficit volatility because nations with lower real GDP per capita characterised with lower and more volatile fiscal deficit due to weak economic institutions and less developed financial market. Moreover results based on political and

institutional variables indicate that low institutional quality (legal and bureaucracy), high internal and external conflicts, high ethnic and religious tensions and high corruption may lead to high and volatile fiscal deficit volatility.

Widely democratic regimes with better social and economic reforms may shrink fiscal deficit volatility. The results indicate south Asian countries have less budget deficit volatility compared to Sub Saharan African nations.

5.1 Policy Recommendations

As the literature confirms that fiscal deficit and its volatility is a serious issue for both developed and developing nations across the world. Therefore, this problem has to be addressed in serious and systematic manner by considering the following policy recommendations

- The nations may target to accelerate the real GDP per capita which is currently not increasing steadily in nations locating in the south Asian and Sub Saharan regions because of slow growth rate of GDP. The governments should take policy measure to stimulate real GDP per capita.
- Another major determinants of fiscal deficit is increasing dependence on foreign debts. As the major part of budget goes into the repayments of interest rates along with principle amount on these debts which further hamper infrastructure and social services provided by the government. Governments of the states may take policy measures that address the issue of growing dependence on the international aid financing agencies.
- The governments may revise their trade policy by controlling imports through imports substitution and diversifying the exports by providing incentive to domestic producers with view to promote exports.

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