

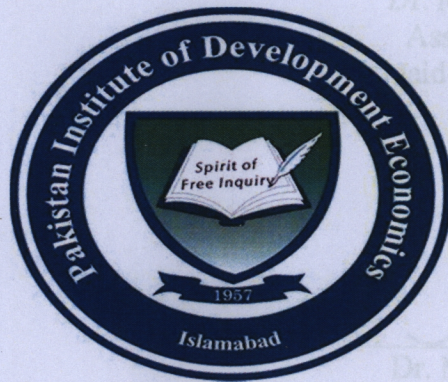
STATE DEPENDENT FISCAL MULTIPLIERS: A CASE STUDY OF PAKISTAN ECONOMY

CERTIFICATE

By

Sajjad Ali
05/MPhil-Eco/PIDE/2014

Supervised by
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Department of Economics
Pakistan Institute of Development Economics, Islamabad

(2018)

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A Dissertation Submitted to the Pakistan Institute of Development Economics, Islamabad, in partial fulfillment of the requirements of the Degree of Master of Philosophy in Economics

Department of Economics
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(2018)



Pakistan Institute of Development Economics

CERTIFICATE

This is to certify that this thesis entitled: “**State Dependent Fiscal Multipliers: A Case Study of Pakistan Economy**” submitted by Mr. Sajjad Ali is accepted in its present form by the Department of Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree of **Master of Philosophy in Economics**.

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Abstract

Macroeconomic policies are mainly aimed at the achievement of the basic objectives of stable prices along with sustainable and accelerated economic growth rate in an economy. Size of fiscal multiplier and the effectiveness of fiscal policy remained a debatable issue from John Maynard Keynes of thought till present volatile economic environment of the world. The state dependent variations in the magnitude of fiscal multipliers along with the fiscal policy as a stabilization tool again become most important and hot debated issue since Global Financial Crisis 2007-2008. This research study investigates the state dependent nature of fiscal multipliers for the Pakistan economy over the time period of 1980: 2015. Jorda's (2005) local projection method (a time series VAR based model) as well as OLS with regime switching dummy is used to obtain impulse response functions and estimate the coefficients consequently to reach on desired objectives of the study. The variations in the size of fiscal multipliers are assessed under two regimes or conditions of the economy: low and high economic growth regimes. Similar to the findings of existing literature the results of the study confirm the argument that effectiveness of fiscal policy to stimulate growth in the economy enhances in the low growth period as compared to the time when growth rate is high in the economy. The findings of this study suggest that authorities can adopt the fiscal policy to stabilize the short run fluctuations in economic activity by increasing the government expenditures, as this tool of fiscal policy is more effective compared to taxes in Pakistan economy's context especially in the times of recession. Results also recommend that in recessions and low growth regimes, government and policy making institutions can rely more on fiscal policy because during this phase of business cycle, government expenditures exert more efficacies while lower in expansions.

Key words: Fiscal policy, Macroeconomic Stability, Fiscal Multipliers, Impulse Response Function, Government Expenditures, State Dependent

Chapter 1

Introduction

1. Background of the Study.

Since the very beginnings of macroeconomics the role of fiscal policy in stabilizing the economy and stimulating the economic activity has been an issue of debate among the scholars and policy makers from different schools of economic thought. Since the Great Depression of 1930 when Classical school of thought's argument of Laissez-faire¹ economy failed the fiscal policy's role as a stabilizing measure against business cycle fluctuations is under considerations by policy makers and researchers. Keynesians were of the view that fiscal policy is more effective and productive to counter the variations in economic growth and output than monetary policy. Keynesian view about the fiscal policy effectiveness failed in 1970 due to hyperinflation, caused by oil price shocks, which leads to fall in aggregate demand and employment at once. Implementation of fiscal policy could not produce desired results; rather it augments the inflation rate and crowd-out private investment. Beetsma and Guilidori (2011), states that use of expansionary fiscal policies as a response to oil price shocks were unable to produced desired results; hence it intensified the concerns about the efficiency of fiscal policy against business cycles fluctuations. Moreover, efforts to fiscal consolidations in European economies during the 1980s, contrary to Keynesian theory, led to a boost in output in the short-run and long-run.

Fiscal policy has been used again as a stimulus during recent recessionary periods of global financial crisis 2007-08 by many developing and developed economies in order to enhance the output and growth. Foster (2009) states that nearly all the governments in Europe, North America and Asia used vigorous form of fiscal stimulus policy during this prolonged recession. The stimulus package used is defined generally as debt-financed consumer-oriented tax cuts and substantial increases in government spending to push up aggregate demand in the hope that economic output, jobs, and incomes. Due to usage of heavy stimulus packages which are financed through deficit financing brought various economies to lose their credit sovereignty. In order to stabilize their fiscal positions and restore credit sovereignty economies rationalize their expenditures and increase their revenues. But efforts to consolidation in various European

¹ This is the doctrine which claims that an economic system should be free from government intervention and be driven by only the market forces.

economies produce contrary results to that of produced in 1980 and bring economies to a deeper recession in recent crisis.

As the time changes, so do the academic debates. After the recent global economic crisis stabilization policies become a vital area for researchers. The ultimate goal of stabilization policy is to moderate the economic fluctuations with their tools. Recent economic crisis had brought the attention of the authorities towards the usefulness of fiscal policy for two reasons: the first argument was that during times of crisis, the credit and monetary policy had hit its lower limit (a situation of zero lower bound interest rate), in this situation there is no choice for policy makers other than fiscal policy for stimulating economic activity and employment during the period of slump. The second argument was that it was expected to have long lasting recessionary phases across the countries. In this situation, fiscal stimulus regardless of its conventional lags in implementation would have adequate time to give positive results and stable the economy. So, in simple words, we can say that in recessionary or bad economic conditions when the economy has economic slack in it, then fiscal policy provides better results than any other stabilizing policy. The essence of argument on this issue has effectively been to echo earlier Keynesian arguments that government spending is likely to have larger expansionary effects in recessions than in expansions. Intuitively, when the economy has slack, expansionary government spending shocks are less likely to crowd out private consumption or investment. To the extent discretionary fiscal policy is heavily used in recessions to stimulate aggregate demand and economist consider it a favorable option, the key empirical question raises that, is there any possibility of fiscal shocks to effect differently over the business cycle? The answer to this question is not only interesting to policy makers in designing stabilization strategies, but it can also help the economics profession to reconcile conflicting predictions about the effects of fiscal shocks across different types of macroeconomic models.

In the process of addressing the question the theory of state dependent multipliers emerged which explores that whether the government expenditure multipliers are dependent on the state of the economy or not i.e. how output responds to changes in government spending at different stages of the business cycle. Observations about the multipliers from the history of economies suggest that magnitude and even the sign of multipliers are not same in each economy and might have a tendency to vary along the business cycle or in simple words it might dependent on prevailing state of economy. As a result, there is a growing body of literature that

investigates the effect of country, time and episode-specific characteristics on the magnitude and direction of fiscal multipliers. This financial crisis has brought an old but important question of macroeconomics to the forefront and made it a hot debated issue again. What should fiscal policy do in a recession? Should it counteract swings in private demand, accepting higher budget deficits, or should it aim at sustainable public balances? The answer to these questions depends, among other things, on how large the fiscal multiplier and why its size varies in an economy. As multipliers revealed the fiscal policy effects on output so they are fundamental elements which should be considered while preparing the policy design and policy advice. Underestimating multipliers may lead countries to set unachievable fiscal targets, and miscalculate the amount of adjustment necessary to curb their debt ratio Eyraud and Weber (2012 -2013).

The Classical, Keynesian and Monetarist debate about effectiveness of fiscal policy and crowding-out, in effects of fiscal multiplier, is most important and oldest macroeconomic level debate. Then, why this topic is revisited by researchers after 2010? Firstly, despite the oldness of the fiscal multiplier concept, it seems that new empirical evidence has emerged, highlighting concept of non-linear fiscal multipliers. The trend started over in 2011 with study of Auerbach and Gorodnichenkos (2012a) where they provide evidence of a heterogeneous fiscal multiplier and presented that symmetric fiscal shocks have asymmetric effects for real GDP in U.S. economy. They also concluded that policy effects being larger during recession periods when compared to normal times. Secondly, the recent debt crisis in Europe and austerity packages have expressed that how important it is for the researchers' community to update the literature to cater these challenges. Moreover, here are various issues with standard macroeconomic models like; most of the macroeconomic models express economic structure by linear methods. At least, researchers should test them for nonlinear dynamics. This innovative research mark creates opportunities to study non-linearities by using regime switching models and testing for heterogeneous fiscal multipliers. This thesis aims to contribute to the Pakistan fiscal multiplier literature by exploring this new heterogeneous approach, together with its nonlinear methodology.

2. Historical Research Gap

In literature various research studies have been conducted to estimate the size of fiscal multipliers of spending shocks in different economies. There are very few studies which tend to study the exogenous fiscal policy shocks and its impact on economic growth in Pakistan. The

earlier literature revolved around the discussion about the relative importance of fiscal and monetary policy on aggregate economic activity (Hussain, 1982; Massood and Ahmad, 1980; and Saqib and Yasmin, 1987). While only a study conducted by Javid and Arif (2009) estimates the dynamic effect of fiscal policy in Pakistan. To the best of my knowledge this study is the first one which contemplates a non-linear model which assumes that fiscal multipliers may differ under different growth regimes of Pakistan economy. A panel study by Hayat and Qadeer (2016) measure the size and impact of fiscal multipliers in Selected South Asian Countries including Pakistan Moreover, Jorda's local projection method is used which is a technique recently used for measuring the size of the fiscal multiplier in the literature.

2.5 Objective of the Study

The objective of this study is to empirically investigate the fiscal multipliers in bad and good conditions of the economy through short-term fiscal multipliers in Pakistan's economy for the period of 1973-2016.

1.3 Significance/ Contribution of Study

In addition to the objectives mentioned in (section 1.2), the present study seeks to link the debate surrounding short-term fiscal multipliers and their dependence on the prevailing state of the economy especially in developing countries.

1.2 Research Questions

Following research questions are formulated to address in the study: What does fiscal policy play role in macroeconomic stability in Pakistan? Is fiscal policy stance relatively more potent to attain macroeconomic stability in low growth periods? Whether policy making authorities should use fiscal instruments to curtail business cycle fluctuation or not?

2.6 Motivation

Inspirations for the present study are as follows

1. Fluctuations in reputation of fiscal policy studies in last three, four decades
2. Vagueness in results of the available research studies;

3. Revival of fiscal policy effectiveness and its popularity in the aftermath of the most recent global economic crisis, which has proved the inadequacy of monetary policy to solely influence economic cycles; and
4. Very few studies on developing countries (most available research is done for OECD and advanced countries), regarding cyclical effects of fiscal policy.

1.4 The Outline/ Organization of the Study

Chapter 1 is about the introduction of the topic in which we discuss issues of the study, find the literature gap, formulate research questions, and determine the objectives of the study and at last motivation. We have done a detailed review of the literature in chapter 2. We have developed theoretical framework, performed descriptive analysis and discussed our data and variables, model and estimation methodology in chapter 4. Results are computed and discussed in details in chapter 5. At the end, we conclude our study and formulate some important policies and entail their implications.

Chapter 2

Pakistan Economy and Fiscal Policy

2.1 Brief Review of Macroeconomic Environment of Pakistan

Pakistan is a developing, fluctuating and consumption oriented economy. Here are occasional growth spurts, but has not been sustainable unfortunately. Various economic, political and social issues have been faced by it for years and resulted in a near-crisis like situation in 2013, specifically owing to the unstable security situation, crippling energy crisis and ensuing large foreign exchange requirements with the alarmingly lower level of foreign exchange reserves. Besides, a number of deep structural problems, which have been there for decades, added to the woe in the form of weak financial position rooted in low tax revenue, limited export growth, and insufficient investment in human capital development, weak infrastructure and low economic activities.

Table 2.1 Pakistan's Macroeconomic Environment

Variables/Years	1970s	1980s	1990s	2000-2010	2016-17
		Growth Rates			
Gross Domestic Product	5	7.1	4.4	4.22	5.8
Agricultural	2.4	4.1	4.2	3.01	3.46
Industry	5.5	8.2	4.6	7.39	5.02
Services	6.3	6.7	4.5	5.13	5.98
Inflation (GDP deflator)	12.2	7.6	10	9.62	3.5
		Percent of GDP			
Saving	11.2	14.8	13.8	16.61	13.1
Investment	17.1	18.7	18.3	18.69	15.78
Budget Deficit	7.6	6.8	7.3	4.58	4.6
Current Account Balance	-5.2	-2.8	-4.1	2.14	2

Sources: IFS and Economic survey of Pakistan various issues

Pakistan is considered as the lower-middle-income economy on the basis of per capita income. Agriculture, industry and the service sector are considered major contributors of the Gross Domestic Product (GDP) of the economy with a share of 21.02 percent, 19.82 percent and 59.16 percent respectively. Growth in GDP accelerates up to 4.71% in 2015-16 compared to 4.04 % in the previous year. As concerning about the fiscal position of the economy, the fiscal deficit has been reduced significantly from 8.2 percent of GDP in FY2013 to 5.3 percent during FY2015. While during July-March, FY2016, the fiscal deficit has been reduced to 3.4 percent of GDP as compared to 3.8 percent during FY2015. The economy is on the path to reduce the fiscal deficit further to 4.3 percent of GDP during the current fiscal year. However, fiscal deficit is still slightly higher compared to budget target. Fiscal consolidation measures during year are challenged by lower collections compared to the expected tax revenues, expenditures however remained under control.

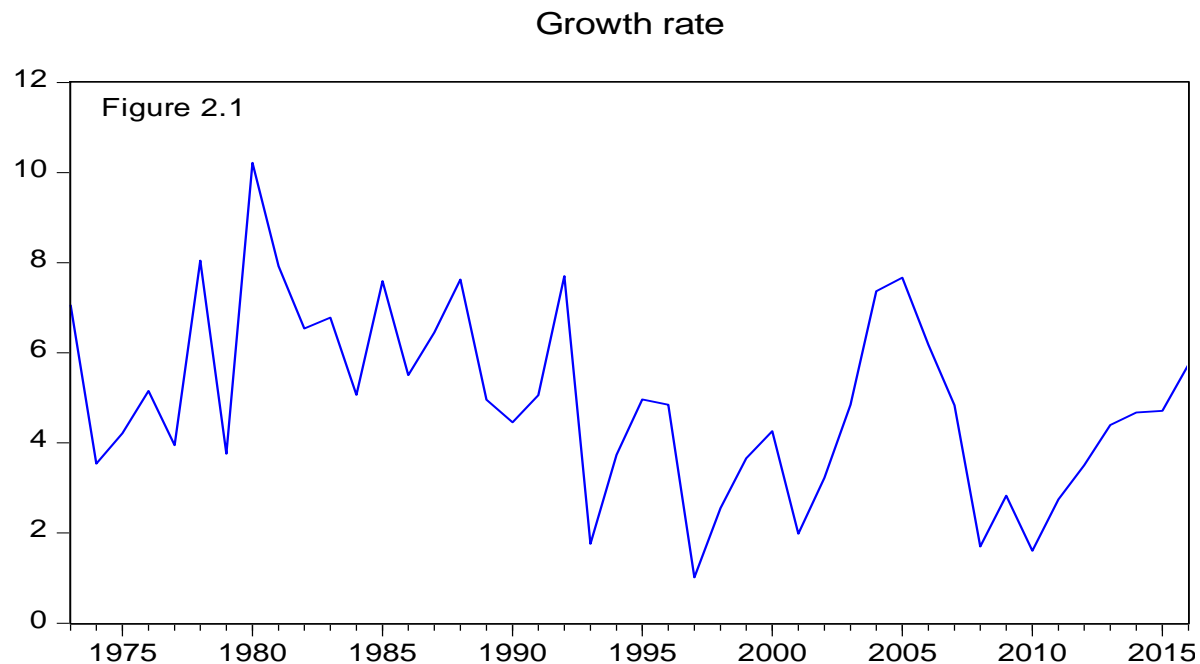
The Real GDP growth rate was 5% in 1970s and 7.1 % in 1980s, which slowed to 4.4% in the 1990s, slightly improved to 5.2% in the 2000s. GDP growth rate again slowed after 2007 near to 1.6% in 2010 and then after 2013 it start to improve and reached up to 5.8% in 2015 (Table 2.1). During the decade of the 1970s, public savings were low largely because the fiscal deficit and the primary deficit remained at 7.6% and 5.9% of GDP. The average inflation rate remained high i.e. 12.2 % (Table 2.1) and the possible reasons for this high inflation were high oil prices, an increase in remittances, and enhanced public consumption along with the decreased production output. The current account balance was in deficit of 5.2% of GDP on average. The deficit resulted from huge imports; even the boost in the exports as a result of massive devaluation of 131% in 1972 could not nullify the impact.

In the 1980s, GDP growth remained at 7.1% on average, whereas the inflation rate was 7.6% on average as compared to 12.2% in 1970s. The current account balance remained in deficit at an annual average rate of 2.8% of GDP throughout the decade. It was better than that of the 1970s, mainly due to the decrease in imports and enhanced remittances during this decade. The fiscal deficit was about 6.8% of GDP on average, whereas the primary deficit was recorded about 3.5% on average.

However, in the 1990s, Pakistan witnessed the lowest GDP growth rate between the regional countries and this was attributed to the sharp decline in capital inflows. The poor economic performance during the 1990s and the failure to limit the fiscal and current account deficit led to unprecedented and unsustainable levels of public debt. During the decade of 1990s, the GDP growth rate remained about 4.4% on average and the average inflation rate remained high i.e. 12.2 % (Table 2.1). The budget deficit and primary deficit remained 7.3% and 1.3% of GDP on average respectively in this decade. During the 1990s, the Pakistan economy also faced some external shocks, including economic sanctions, the September 11 event and tension on the Afghanistan border area. Many analysts termed this period as a “lost decade” for Pakistan economy.

The decade of the 2000s brought the challenges of high inflation, unemployment growth, poverty and the large fiscal and external deficits, as well as the external shocks of war on terrorism. Thus the improvement in GDP growth proved to be short lived. The factual position of Pakistan's growth and development till the sixties and seventies has been reported by Papanek (1967), Lewis (1968) and etc. During this time, the GDP growth rate remained around Amjad (1984) an annual average of 4.9% and the inflation rate annual average was 5.7% per annum. The fiscal deficit remained around an annual average of 4.5% of GDP. The period recorded investments around annual average of 17.3% of GDP and saving rates remained around 17.8% of GDP on average.

The following figure shows the trend in annual fluctuations of the GDP growth rate of Pakistan from 1976 - 2015.



If we look back in history, the Real GDP growth rate was 5 percent in 1970s and 7.1 percent in 1980s which slowed to 4.4 percent in the 1990s and improved to 5.2 percent in the 2000s.

21st century starts with the challenges of high inflation, unemployment, slow growth, increasing poverty and the large sized fiscal and trade deficits, as well as shocks of war on terrorism. Global financial crises of 2007-2008 have also presented signs of recessionary phase in Pakistan and in 2009 annual economic growth rate 1.7 percent, which was lowest in history of Pakistan. Hence, a lot of fluctuations were there in economy during first decade of this century. Both, lowest and highest, growth rates were recorded in same decade.

The data presented in graph explaining the current and past trends in economic expansion of economy, decade of 2010s is started form a recovery and exhibits 3 percent annual growth of GDP. The increment in economic growth is not much extraordinary but is consistent, annual growth increasing gradually with every upcoming year. Growth of economy is recorded at 5.71 percent in the 2016 which was the highest growth in last eight years.

2.2 Fiscal Policy and its types

Fiscal policy refers to deliberate changes in government expenditures and taxes as tools to boost and stimulate the economic activity and remove fluctuations in output and employment. It communicates through various channels and articulated in the form annual government budget. All governments, particularly in emerging markets, attempt to align their fiscal policies in the manner (i) that there are sufficient revenues available for non-developmental and developmental expenses and (ii) that there is enough 'disposable income' with individuals and corporate making enough savings/funds for investment by the private sector. These are essentially two contradictory objectives. Maintaining a balance is a tough challenge. Maintaining a balance is the beauty of good policy governance. Both objectives are independent in character; nevertheless there are intricate underlying interdependencies. **The long tried macro-economic problem with the fiscal policy is whether government spending measures can restore an economic organization to its potential level of gross domestic product (GDP) by minimizing the output gaps Spencer and Amos (1993).** Government expenditures (either current or developmental) on goods and services are elements of mass demand and hence these affect the economic activity directly; however, transfer payments and imposition of taxes, affect disposable income and thus indirectly influence the other two major components of aggregate demand i.e. consumption and investment spending. Therefore, fiscal policy works through the changes in government budgets and induce changes in aggregate demand while considering possible crowding out effects of government spending and taxes in an economy.

A government budget deficit occurs when it increases spending and/or cut its taxes. If the government runs a deficit, it will have to borrow funds to cover the excess of its spending relative to revenue. Larger budget deficits and increased borrowing are indicative of expansionary fiscal policy. In contrast, if the government reduces its spending and/or increases taxes, this would shift the budget toward a surplus. The budget surplus would reduce the government's outstanding debt. Shifts toward budget surpluses and less borrowing are indicative of the restrictive fiscal policy. However, the rising level of budget deficits in recent years has forced policy makers to study and analyze the fiscal policy and its ability to influence the

economy. A great deal of public attention has focused on the size of the deficits and their possible negative/positive effects through estimation of fiscal multipliers in different economies.

In developing countries, excessive government borrowing from the banking system as well as from the international sources to finance a large fiscal deficit causes massive monetary expansion, which in turn leads to disequilibrium in the balance of payments. In developing countries, the government often depends upon deficit financing due to its inability to mobilize domestic resources, a relatively narrow tax base, and an inflexible tax structure (Tanzi, 1982). The Pakistan economy a developing economy is also characterized with huge a fiscal deficit, which is financed either by borrowing debt or printing new money. Having underdeveloped financial markets, most often a large budget deficit is financed through printing of new money and therefore the implementation of monetary policy is heavily dependent on the fiscal decisions made by the government. Sargent and Wallace (1981) discuss the link between fiscal and monetary policies and they argue that monetary policy will not be able to control inflation unless supported by fiscal policy. In this framework inflation is a fiscal driven monetary phenomenon and nominal monetary growth is endogenously determined by the need to finance exogenously given deficit to satisfy the budget constraint.

There are three ways, through which fiscal policy can influence the short - term setting of monetary policy and economy; Firstly, fiscal policy can influence economic growth and prices via discretionary fiscal policy stabilization. Secondly, the operation of automatic fiscal stabilizers can contribute to reducing short-term instability. Thirdly, governments have some instruments at their disposal that have a quick effect on prices, such as changes in tax rates. Monetary policy on the other hand has an effect on the cost of financing government debt and the potential financial market effects of financing decisions. Hence, in a coordinated environment, it is expected that an effective monetary policy monitors the fiscal policy stance whereas fiscal policy maintains macroeconomic stability.

2.3 Fiscal Policy of Pakistan

Historically, Pakistan is categorized with macroeconomic imbalances such as extremely high foreign and domestic debt, high budget and current account deficits, extremely low international reserves, high inflation, high nominal interest rates and low economic growth. The

current fiscal deficit is about 6% of GDP and average economic growth over 40 years remains around 4 percent. These macroeconomic imbalances have also contributed to high inflation and unemployment over the period. One of the culprits often cited for the haphazard growth experience of Pakistan is fiscal imprudence. The root cause of our economic destruction has been the policy of 'reckless borrowing and ruthless spending—Dr Ashfaq H Khan, Economy in 2012-2013, The News, August 8, 2012. The origin of fiscal deficits in Pakistan is very similar to other developing countries. In brief, an increase of foreign funded development spending during the early to mid-seventies, primarily in the form of investment by public enterprises, proved to be relatively permanent, and the public sector was unable to generate the revenue either through taxation or from the direct return to the investment undertaken to close the fiscal gap thereby created. High domestic and international debt, high fuel prices and consistently high budget deficits still are central issues in Pakistan's macroeconomic policies.

In Pakistan, macroeconomic disparities have contributed to the deceleration in economic growth and investment which in turn was translated into a rise in poverty levels. In this context a rule-based fiscal policy, enshrined in the Fiscal Responsibility and Debt Limitation (FRDL) Act 2005 was passed by the Parliament in June 2005. This act is intended to introduce financial discipline in the country and to guarantee responsible and accountable fiscal management by all governments - the present and the future, and to encourage knowledgeable public debate about fiscal policy. It requires the government to be transparent about its short and long term fiscal intentions and imposes high standards of fiscal disclosure. Current tax structure is not helpful in growth enhancing. Therefore, structure of tax needs to be reformed in such a way that it helps the growth process as well as maintain equity. Development expenditures need to be increased with a curtailment in current expenditures to boost growth as mentioned by Ahmed et al. (2015). It is argued that in order to achieve high economic growth, Pakistan's economy must achieve fiscal soundness, among other things, and to this end fiscal consolidation is advocated. Consequently, fiscal consolidation through increasing revenues and decreasing deficit financing was among the major policies adopted in 1990s, but the outcome of the policy was not impressive. Like many other developing economies, the deficit remains high in Pakistan because of the political and the administrative incapability of the government to mobilize additional resources or to cut current expenditures. Weaknesses in the tax system have led to an inelastic tax structure and a heavy reliance on trade taxes for revenues (Haque and Montcal, 1991).

At present, fiscal policy in Pakistan is attempting to incorporate both expenditure- and revenue-based consolidation through prudent expenditure management and efficient resource mobilization. The government is taking strict measures to manage fiscal profligacy, but at the same time, the government needs to enhance the tax net greatly. Consequently, the fiscal deficit came down to 5.3 percent of GDP in 2015 from 7.3 percent in 2008 due to the measures taken by the Government. Moreover, authorities are intended to further curb this deficit down to 3.5 percent by 2018. Because of expenditure-based consolidation, the government expenditures stood at 13.6 percent during FY-2016 compared to 13.9 percent of GDP in FY-2013. The austerity measures and current expenditure curtailment have made it possible to bring the current expenditures down to 16.1 percent of GDP from 17.4 percent during the 2008–2015 period. On the other hand, the tax revenues increased from 9.9 percent of GDP in 2008 to 11.1 percent in 2015. This is an indication that the fiscal consolidation measures of the economy have started effect on the economy. But sluggish real economic growth rate, which was 5 percent in 2008 but decline up to 4 percent in 2015, has generate a question mark about the effectiveness and success of fiscal consolidation.

Analysis of fiscal performance in the previous two decades reveals that the major burden of fiscal expenditures is high subsidies coupled with decreasing tax revenue to GDP ratio. Interestingly, even during the period of fiscal improvement (1999-2004), tax to GDP ratio declined. Tax revenue as percentage of GDP decreased to an average of 9.1 percent during 2008-2015 from an average of 13.7 percent during 1992-96. Low tax to GDP ratio has also translated into falling total revenue to GDP ratio as it decreased from an average of 18 percent during 1992-96 to 13.65 percent during 2008-15. The fiscal performance improved significantly during last two years, both in terms of revenue mobilization and expenditure management. Furthermore, both spending and revenue measures have important implications for the economy and these need to be considered if the ongoing fiscal consolidation efforts are to be sustainable. Moreover, the structure of expenditure doesn't amenable to large cuts as our defense expenditures constitute about 25 percent of total expenditures with interest payments another 15 percent, and administration (including social services) another 15 percent. The burden of expenditure cuts, therefore, falls on development expenditure at the cost of much needed infrastructure.

During 1977–88, the public debt grew at the average annual rate of 17.7 percent in nominal terms and nearly 10 percent in real terms. In Pakistan, the ratio of debt to GDP increased from 48.16 percent in 1980-81 to 71 percent in 1988-89. The debt problem became worse in the 1990s and reached an unsustainable level by 1999 because of the persistence of large fiscal and current account deficits during the last two decades. The result of persistent and expanding fiscal deficits, stagnant export receipts, diminishing worker remittances, and large current account deficits. Pakistan economy experienced some improvements during the early years of this century. Growth slightly accelerated and most macroeconomic indicators improved. Public debt indicators also showed significant improvement. Modest growth in public debt, coupled with the growth in nominal GDP, led to a significant fall in public debt to GDP ratio, from 81.4 percent in FY2001-02 to 56.1 percent in FY 2006-07 then it increased up to 59.3 percent in FY 2013-14 and currently the volume of public debt is at Rs. 19,168 billion by end of March 2016.

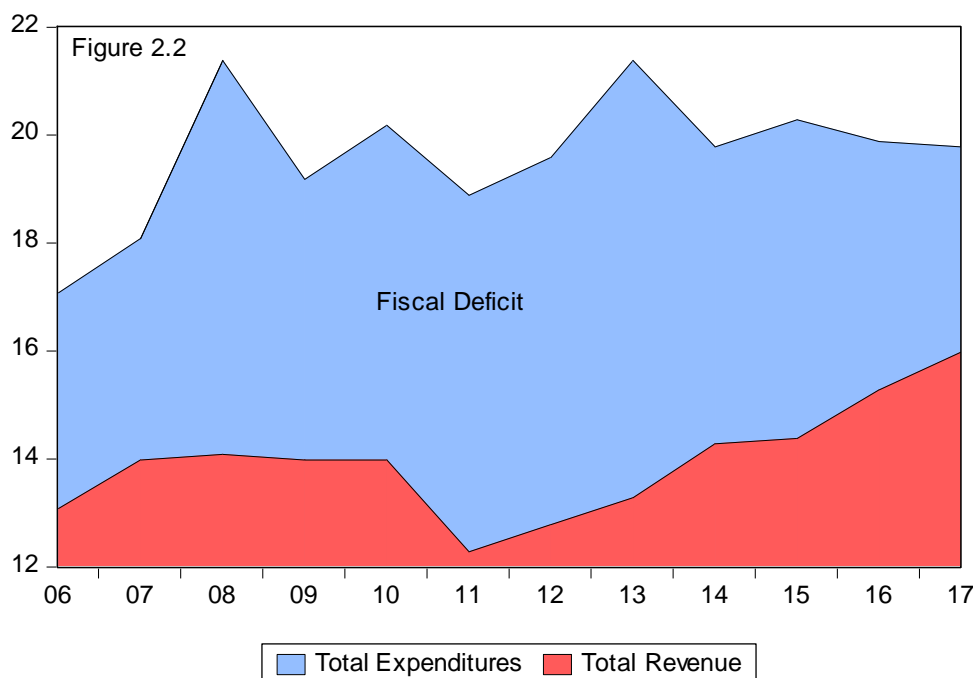
Tax revenue to GDP ratio between 9.5 percent and 10.4 percent in Pakistan is low compared to neighboring and similar economies. Approximately this average in OECD countries is 36 percent, while this ratio in welfare oriented states like Sweden and Norway is as high as 49.7 and 43.6 percent of GDP respectively. Several important weaknesses exist in Pakistan taxing system. First, wide-ranging immunities, exemptions, and concessions, punctured and narrow tax base. Second, high levels pitched tax rates created a vicious cycle for the erosion of tax-base and higher rates. Third, problem of multiplicity in application of taxes, as an individual firm is facing numerous sorts of taxes. Fourth, over reliance on indirect taxes, which increase the regressiveness of the tax system, this accounted for almost 60 percent share in revenues. Fifth, existing tax system is and complex, which along with high rates, has bred corruption and encouraged evasion (Ministry of Finance Report, 2008). Iqbal (1994), Pasha (1995), Pasha and Ahmed (1998) concluded that inefficient and the failed revenue generating system is a major cause of high and persistent fiscal account deficits in Pakistan. Certainly, Pasha and Iqbal (1994) suggest that “the unfinished task of tax reform requires a level of political commitment and willingness to improve the quality of tax administration which has hitherto been lacking”. A report by Andrew Young Institute of Public Policy (2009) on Pakistan’s tax structure explains “there is broad consensus that Pakistan’s tax system underperforming, as its tax base is very narrow. The government taxes only a limited number of people, businesses and sectors. The

lower level and large volatility of these tax revenues has greatly constrained the government's ability to make plans for development and poverty reduction, and respond adequately to sudden economic crises. These weaknesses are so grave that they can undermine the confidence in Pakistan's economy as a whole".

Table 2.2 Fiscal indicators, as percentage of GDP

Year	Overall fiscal deficit	Total Exps	Current Exps	Dev Exp	Def Exp	Mark up payment	Total Revenue	Tax Revenue	Non-Tax Revenue
2006	4	17.1	13.6	3.4	2.9	2.9	13.1	9.2	3.9
2007	4.1	18.1	14.9	3.2	2.7	4	14	9.6	4.4
2008	7.3	21.4	17.5	3.9	2.6	4.6	14.1	9.9	4.2
2009	5.2	19.2	15.5	3.7	2.5	4.8	14	9.1	4.9
2010	6.2	20.2	16	4.2	2.5	4.3	14	9.9	4.1
2011	6.5	18.9	15.9	3	2.5	3.8	12.3	9.3	3
2012	8.8	19.6	15.6	4.1	2.5	4.4	12.8	10.2	2.6
2013	8.2	21.4	16.3	5.1	2.4	4.4	13.3	9.8	3.5
2014	5.5	19.8	15.8	4	2.5	4.6	14.3	10.1	4.2
2015	5.3	20.3	16.2	4.1	2.5	4.8	14.4	11	3.3
2016	4.6	19.9	16.1	4.5	2.6	4.3	15.3	12.6	2.7
2017	3.8	19.8	15	4.7	2.6	4.1	16	12.9	3.1

Source: Economic Survey of Pakistan 2015-2016.

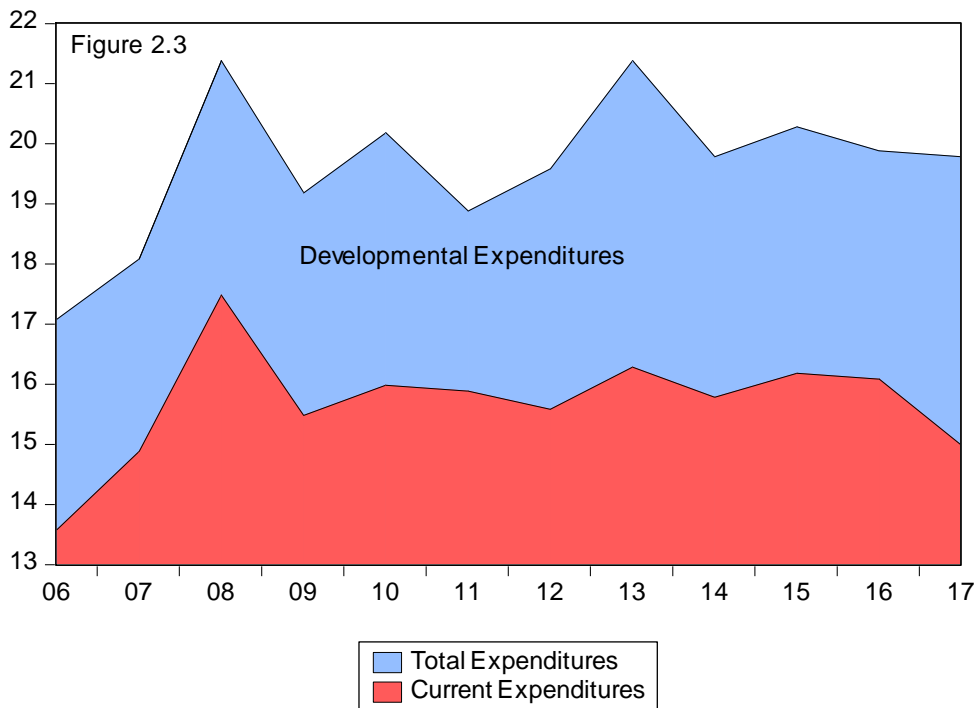


1. Fiscal Expenditures

In Pakistan, total expenditures in the National Accounts are divided into current and development expenditures. Subsidies, defense and debt servicing have constituted the major share of current and total expenditures, whilst development expenditures are very low. Table 2.2 depicts the components of expenditures as percentage of GDP. During the sample period as we can observe from table 2.2 and figure 2.1 that major chunk of fiscal expenditures comprised of current expenditures and a share of developmental expenditure is not much lucrative as it should be for the growth and development in the economy. Shown by data government suddenly increased its spendings after 2007, this huge increase or expansionary fiscal stimulus can be a response to the global financial crisis. After 2013 government expenditures reduced gradually as the government was focusing on consolidation efforts to stabilize fiscal conditions of the economy by curtailing current expenditures and increasing share of developmental expenditures. Objective of recent fiscal efforts in Pakistan has been to sustain macroeconomic stability, while

ensuring an environment that is conducive to economic growth. Budget 2016-17 shows its priorities as reduction of the fiscal deficit by broadening the tax base and taking additional measures to raise revenue. Acceleration of economic growth and expansion of the social safety net through higher budgetary allocations for the Benazir Income Support Program (BISP).

This has entailed reducing the fiscal deficit without cutting development expenditures (State Bank of Pakistan, 2016). Table 1 shows that the overall budget deficit has declined substantially from 8.2 percent of GDP in FY2013 to 4.6 percent in FY2016, largely due to better expenditure management (Pakistan, Ministry of Finance, 2017).

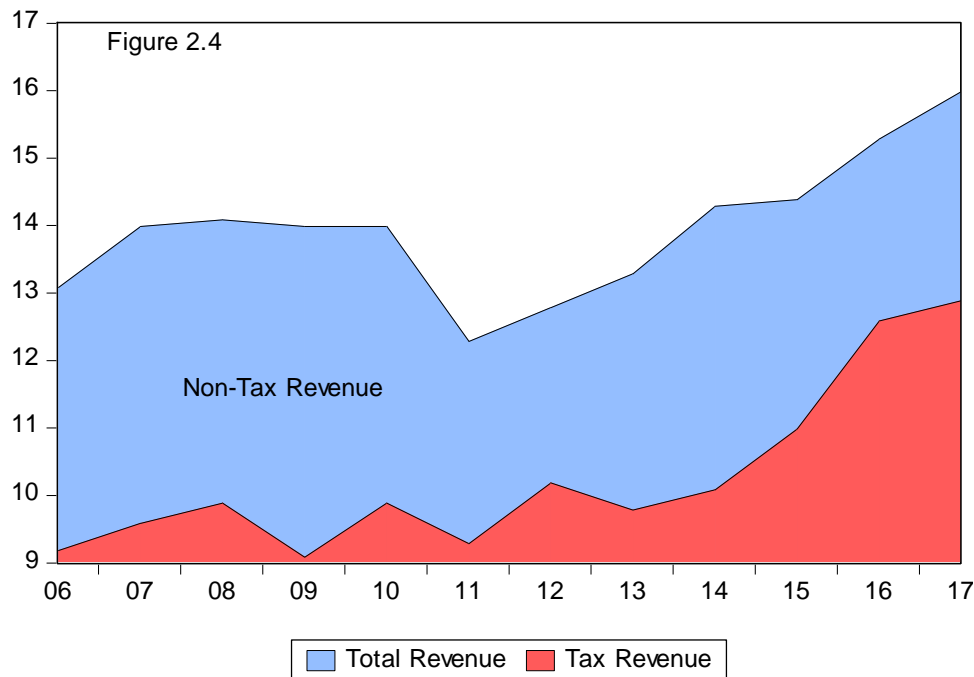


2. Revenues

Revenue generated through tax is the most efficient, effective and integral channel to improve country's efforts to mobilize the domestic resource through which state institutions raise income for public expenditures which are compulsory to the economic growth and development. Additionally, government use this instrument to increase its capacity of diverting resources to development projects, consequently reduction in poverty and delivering public services. Nevertheless, to attain all these objectives, it is

very essential to build and operate an equitable, efficient and sustainable growth-oriented tax system. Due to various political, economic, administrative and structural challenges Pakistan failed to enhance tax collection and build a growth oriented tax system which is necessary to create sufficient fiscal space. Until FY2015, tax to GDP ratio overall ranged between 9.1% and 11.0%, but here is improvement in tax collection and tax to GDP ratio rose significantly and grasped 12.6 % of GDP. Substantial improvements in tax collections during FY2016 mainly credited to improved collections under Gas Development Surcharge (GDS), Gas Infrastructure Development Cess (GIDC) and Petroleum Levy. The collection under these heads mounted up due to higher trend in sales of gas and oil related products. Of total tax revenue, FBR tax collection as a percentage of GDP has also witnessed a remarkable improvement and stood at 10.7 percent of GDP in FY2016. The improvement in FBR tax to GDP ratio has been on account of considerable reduction in tax concessions and exemptions, increased withholding taxes on non-filers of income tax returns and improvements in tax compliance and enforcement. Pakistan's tax structure is heavily reliant on indirect taxes. However, in recent years, Pakistan's tax structure has seen a great transition from indirect to the direct tax system. In FY2006, indirect taxes constituted 68 percent of the total FBR tax collection, while the direct taxes accounted for only 32 percent. The proportion of direct taxes in total FBR taxes has increased steadily to 39.1 percent in FY2016, whereas the share of indirect taxes has reduced to 61.0 percent during FY2016. During the current fiscal year, the share of direct taxes is expected to increase further to 43 percent on

account of various tax measures initiated by the government.



3. Conclusion

This chapter provides an overview of Pakistan's macroeconomic environment. In Pakistan, the conduct of fiscal policy remained a challenging task for the concerned authorities. The fiscal profile has been characterized by budget deficits and the accommodation of fiscal deficits by the monetary authorities has been more of the norm than the exception. The trends in GDP growth were stable during the 1970s and 1980s, but the 1990s onward period remained a difficult time for the Pakistan economy with low GDP growth rate as well as double digit inflation.

Furthermore, Pakistan's fiscal structure is categorized with high current expenditure and an inelastic, non-progressive tax structure with a narrow tax base which always resulted in a high budget deficit. Despite the introduction of tax system reforms, the tax to GDP ratio remained low at around 12.5% of the GDP over the last 3-4 decades. The fiscal authorities always resorted to finance fiscal deficits by domestic borrowing and external finance which resulted into ever rising public debt and high expenses on debt servicing.

Chapter 3

Theoretical and Empirical literature review

Discussion about the magnitude and sign of the fiscal multiplier leads us to the debate between the two main schools of economic thought in the twentieth century, Neoclassical and Keynesian. Efficiency and role of Fiscal policy are considered by these schools of thought under the assumption: existence, or lack, of Ricardian families. If we consider the Keynesian framework, an increase in the level of Government spending or a cut in tax boost up aggregate demand, consequently employment and income. Traditional IS-LM model, explains that aggregate demand increases by a shift of IS curve, and the magnitude of the fiscal multiplier depends on the magnitude of shifting in IS curve and the slope of the LM curve as well. While considering Neoclassical approach and the existence of a Ricardian net effect of fiscal policy is not significant and according to them fiscal policy is not a viable option to curtail the business fluctuations in the economy.

Temporary and counter-cyclical fiscal policy can be a good option, if there is a decline in aggregate demand; for example a reduction in investment. This decline in aggregate demand would be improved and offset by increasing government purchases, transfer payments or by providing a tax cut temporarily. So an increase in government spending, which are augmented by possible multiplier effect will adjust the "gap" generated due to declining investment expenditures. Tax or transfer payment policies would directly change the disposable personal incomes and stimulate consumption expenditures through the wealth effect channel. But naturally, this transmission effect of fiscal policy is temporary in nature and raise questions about stabilizing role and efficiency of fiscal stimulus tools Hillier (1991).

According to Mundell-Fleming (1960, 1963, and 1962) model, in the regime of pegged exchange rate, expansionary fiscal stimulus would lead to increase in interest rates, which create pressure and appreciate national currency. To retain the pegged exchange rate the Central Bank use monetary policy and increase supply of money through the purchase of foreign currency. So high magnitude fiscal multipliers are generated in pegged exchange rate regime wherein flexible or floating exchange rate regime fiscal multipliers are usually lower. Hence it is concluded,

according to the Keynesian view effectiveness and efficiency of fiscal policy is associated with the state and the role of monetary policy. If monetary policy is ineffective (liquidity trap) or dedicated to goals such as keeping the interest rates or exchange rates fixed, an expansionary fiscal policy will produce positive fiscal multipliers Cos and Moral-Benito (2013). In “The General Theory of Employment, Interest and Money” by Keynes (1936) defended a temporarily counter-cyclical fiscal policy. Expansionary fiscal policy should be used by the Government only in the state of deep recessions to curtail the crowding-out effects. An economy’s state of deep recession indicates that there are idle resources; unemployment is persistently high (above what is now termed the “²NAIRU” level) and prevalence of market failure. The stimulus impact of fiscal policy act by two major channels: wealth and optimism channel in the short run while, enhancing GDP growth by boosting savings and levels of investment in the long run.

From the above discussion, it is observed that defense of heterogeneous and positive fiscal multipliers is effective in deep recessionary periods than in a state of expansions of the economy. From a pure theoretical aspect, the existence and size of fiscal multiplier is directly depends on the assumptions of the model. The Keynesian framework made assumption that stimulus tools of fiscal policy boost up capital level and furthermore, it considers expenditures or investment in the public goods is a reaction to market failures, not to state failures, then the fiscal multiplier is necessary and significant. On the other end, the neoclassical school supports to another approach based on such assumptions which produce fiscal multipliers of low magnitude. A most influencing author in this research field, Barro (1974) examines the assumption that bonds issued by the government are considered as net wealth by the people, indicating that if they are forward-looking and aware of the fact that the government will utilize future tax incomes to servicing these bonds. This will lower their expectations about their wealth and ultimate wealth effect accompanying with government issued bonds will be neutralized. The author analytically highlights that considering assumptions used in the Ramsey growth model (infinitely lived households and consumption smoothing), consumers will react to a stimulus fiscal effort in the same way either, it is financed by current tax rate increases or by running a deficit and borrowing (i.e., By future taxes) termed as Ricardian Equivalence Theorem.

² The non-accelerating inflation rate of unemployment (Nairu) - also referred to as the long-run Phillips curve - is the specific level of unemployment that is evident in an economy that does not cause inflation to rise up. NAIRU often represents equilibrium between the state of the economy and the labor market.

However, all these conclusions, either they are theoretical or empirical in nature; strictly depend on approaches used by researchers. Different assumptions of the model about the nature of fiscal spending, a particular source of financing used to finance fiscal stimulus and price rigidities, various parameter adjustments and persistence of fiscal shocks lead toward diverse nature as well as the size of the fiscal multiplier. Both Keynesian and Neoclassical models entail a positive fiscal multiplier in response to fiscal stimulus, these models have controversies only on the magnitude of the response and the responses of the different GDP components like controversial effects on consumption multiplier or even the discrepancy over the fiscal policy transmission channels. Normally, models developed under the neoclassical approach will result in negative consumption multipliers due to a negative wealth effect, while on the other side models considering Keynesian version will generate a positive multiplier.

3.1 The Homogenous Multiplier

Researchers from various schools of thoughts have contributed to the literature about fiscal multipliers so far. If we study literature until very recently, one homogeneous fiscal multiplier was defended that would be valid and not dependent on the prevailing state of the business cycle. Some of the research papers to study theoretical and empirical aspects of linear or homogeneous fiscal multiplier are discussed below. Literature concerning the theoretical aspects emphasized the economic modeling, while the literature covering empirical side emphasized the econometric estimation.

A main contribution to our discussion is a paper by Baxter and Kings (1993), where the authors used a standard one-sector growth model with a variable of labor and endogenous capital accumulation to study macroeconomic effects of permanent changes in government spending and found that if government spending is financed by lump-sum taxation then output multiplier will be greater than 1 in long-run, the same conclusion is true for the short-run effects too. In case if labor supply is highly elastic. They also found that government purchases financed through general income taxes causes a negative effect on output. The authors further concluded that dynamic interaction between labor and capital supplies might produce large multiplier effects in economy by permanent government purchases in both short and long run. The short term effects can be explained by a version of investment accelerator, accelerating demands for capital stock puts a direct effect on the demand for labor input. The long term effects can be

explained as effects of increased long-run labor input on the steady-state capital stock. Compared to monetary policy little empirical attention was given to Fiscal policy during the subsequent few years, but Fatas and Mihov (2001) picked some of the most required lines of research in this period. They consider the results of Real Business Cycles, which suggest an inverse correlation between volume of consumption and hours for labor, the authors empirically examined effects of government spending shock on consumption and employment. They concluded that with lump-sum taxes or debt-financed government expenditures, produces a positive (output) multiplier. Difference from the theoretical model is the empirical results about the composition of positive and expansionary effects on output, particularly the prediction of an inverse response by consumption to government spending shocks, caused by negative wealth effects. In sum, the authors indicate that, consumption dynamics generated by Real Business Cycle model still remains a challenge for researchers, considering empirical results, and a possible approach to augment the forecasting, quality of these models could be the use of approximations to reality through, an example, the "insertion of liquidity constraints, inclusion of finite horizons or some sort of myopic behavior by consumers".

The fact, DSGE models have limitations to the reproduction of realistic consumption dynamics in response to government spending shock give motivation to Coenen and Straub (2005), they reexamined the responses of private consumption to fiscal spending shocks by including non-Recardian families in the New-Keynesian DSGE model. They allowed passive fiscal policy rule, to stabilize inter-temporal budget with the use of distortionary taxes, lump-sum taxes and transfers, thus this model features economic agents into four types: the authorities executing fiscal and monetary policy, firms and households. They also assumed heterogeneous households, which are fully optimizing or liquidity constrained. The latter is assumed to be restricted to participate in asset market so consume their total disposable income. The former are able to smooth consumption as they have access to asset markets. The highly persistent nature of government spending shocks creates chances to actually crowd in consumption very low and are unable to generate sufficient positive fiscal multiplier. This result leads that in order to augment the crowding-in effects and to reduce the negative wealth effect because of the highly persistent nature of fiscal spending shocks, the model needs improvements. This limitation was considered by Gal et al. (2007), who introduce a New Keynesian model with rigid prices, where half of the households, followed a "rule-of-thumb". With this condition authors were able to create a

positive response by consumption to an increase in fiscal spending. This condition helps to overcome the empirical gap exist in literature. "Rule-of-thumb" consumers in the model helped to reduce the negative wealth effect moderately; as such agents are more sensitive about the current disposable income than its present value. Still, the necessary condition is stickiness in prices, which makes the real wages possible to increase. Therefore, with higher real wages and higher employment, current labor income increases just enough to stimulate the consumption of "rule-of-thumb" households.

In short, authors solve a theoretical conflict about the response of expenditures on consumption to an expansionary government spending shock, consequently producing a response of the aggregate level of output systematically greater than one argued by the Neoclassical model. Main theoretical gaps filled up and recent studies emphasized mainly to the financial crisis and related topics. A recent example is the study of Christiano et al. (2011) by developing a DSGE model along with the standard Taylor rule, monetary policy authors suggested that nominal interest rate increases as a simple response to an expansionary policy and reduces the magnitude of the fiscal multiplier, normally less than one. Their contribution mainly concerns the results generated by zero-lower-bound modeling where authors seen higher fiscal multipliers and nominal interest rate does not respond to increase in government spending. By introducing accumulation of capital in the model, even with declining the probability for binding zero bound, the model produces a stronger and significant effects of fiscal spending; hence it results in a larger magnitude of the government-spending multiplier.

Considering a different approach in a research study by, Corsetti et al. (2012) focused on the spending reversals observed by the experts recently, described as, after an expansionary/positive spending, which triggers public debt level and cause to government spending decline lower to its long-term trend. They challenge their empirical outcomes, obtained by using a VAR model, with the theoretical outcomes obtained through a two-country New-Keynesian DSGE model. Using former model, they achieved standard empirical results: the positive and larger output response to government spending shock; even if private consumption expenditures present same pattern as the response by output, the crowding-in investment effect is small; the interest rate follows an increasing trend substantially on impact, but its behavior in midterm rapidly decline after two quarters, in conclusion, the volume of public debt displays a

tenacious as well as increasing dynamics and reaches its crowning point after 5 years. In sum, the important point to highlight is that output responses to short-term fiscal stimulus is contingent to the specific policy measure, information and expectations about upcoming fiscal policy as well as role of monetary policy. To end, the authors defined as; crowding-in effects on consumption are primarily driven by the inter-temporal substitution if, the expansionary fiscal shock is strong enough to elevate expectations about decline in future interest rate.

It is very important to refer that although the efforts to improve the theoretical models align them with empirical results, but it's clear that here is little agreement regarding the policy advising aspect. The results mentioned before, mainly depend upon the nature of limitations, assumptions, calibrations and policy specifications assumed by the researchers. As Leeper et al. (2012) stated, the assumptions and specifications imposed to develop a model "a very tight range for the multiplier before the models are engaged into data". Nonetheless, it seems that the efforts to build economic models which are very close to the reality depicted the crucial role that specifications or assumptions, such as assuming nominal rigidities (sticky wages and prices), consumers following a "regulation of thumb" or even different open-economy specifications, have replaced in current modeling approaches. While different specifications of open-economy inclined to thin out the impact of fiscal instruments and size of the fiscal multipliers, which is the result of substitution effect between consumption by internal and external sources, Nominal rigidities assumption imply that, for provision of long-run positive multipliers, approach of New Keynesian thoughts is indispensable.

In the light of theoretical effects, many writers have continued their studies in the light of theoretical issues and lead to the existing literature through empirical applications and handed to the diverse results. A most quoted research paper belongs to Blanchard and Perotti (2002). Using two specifications; deterministic trend and a stochastic trend approach, the author's main focus of this paper is the analysis of dynamic response of output and its components to fiscal expenditures and taxes shocks for the US economy. A survey produced results that an increase in taxes causes all individual factors of GDP to decline and a spending shock goes for the opposite result, but investment presents a less standard dynamics, where both fiscal shocks contribute to its crowding-out force. This effect is less standard if we consider the Keynesian approach where the magnitude of the investment response is dependent on the response of the

interest rate. A structural model proposed by Blanchard and Perotti's (2002) which is further extended by Perotti (2005) measure the fiscal multipliers in response to fiscal shocks, considering five countries for pre and post-1980 periods. The Major result of the study concerned to a lower spending multiplier. Nonlinear and heterogeneous fiscal multipliers for the majority of countries in the sample, adequately positive multipliers found only in Germany and USA and have strong impacts in the pre-1980 period where the output (GDP) and expenditures on consumption respond positively, whereas investment expenditures results in a depressed response. While analyzing the sample from the post-1980 period he finds evidence of an adverse response from expenditures on individual use of goods and services as well as from investment and an increase in the real interest rate. Finally, the author defends that both effects on GDP and its components as a response to both fiscal shocks decreased over time, mainly due to a change in the transmission mechanism, which also contributed to the observed decline of GDP variance in the post-1980 period.

Researchers have attempted to empirically analyze output responses to fiscal shocks and study different countries. They used different data sets by utilizing various econometric techniques and produced controversial results about the role of fiscal policy and its positive or negative effects for the economy, as Martin and Salotti (2011) found that increase in government spending had a significantly positive effect on consumption and investment of private sector for the European Union covering period 1970-2006, furthermore they argued that these effects ended up gradually (faster in case of private consumption), another study which produced the same results by James et al. (2011), quarterly data for Slovenia's taxes and government spending from 1995:1 to 2010:4 is used. They found positive responses of output to government spending stimulus shocks, but shocks became insignificant for next periods. On the other hand, tax shocks had negative effect on impact and shock also became insignificant in next periods. Bose and Bhanumurthy (2015) estimated positive expenditure multipliers from 1991-2012 for Indian economy where tax multipliers were in the range of -1 . On the same lines Silva et al. (2013) concluded that the public spending stimulus package had a negative effect on output, but the effect is positive in cumulative perspective. On the other hand, taxes had an overall adverse effect on output, for a panel of the Euro area from 1998-2008. For Mediterranean countries Minea and Mustea (2015) analyzed positive and significant responses of output on impact by giving shock in government use of goods and services and investment. But after one year

government investment became three times larger than government consumption multipliers. Studies as well demonstrate that fiscal multipliers are small and short lived for instance; Trezzi et al. (2010) estimated short lived and small fiscal multipliers for Argentina, based on the data from 1993Q4-2004Q3. On the same pattern Parkyn and Vehbi (2014) investigated positive, but small fiscal multipliers for short-run in the case of New Zealand. These small and short lived multipliers might be due to some leakages from the economies. As Espinoza and Senhadji (2011), Silva et al. (2013) and Gonzalez-Garcia et al. (2013) accessed weak and below unity value of multipliers due to substantial leakages through remittances, imports and degree of openness.

Further empirical developments focused on alternatives for the identification method such as the narrative approach as in Romer and Romer (2010) who studied the effects of tax multipliers on the economic activity and defended that an exogenous tax increase of one percent of GDP contributes to a decrease of the real GDP of approximately three percent. Further extensions also include panel data analysis, e.g. Ilzetzki et al. (2010) work, which state that future fiscal multipliers will tend to zero or even negative values due to country's high debt ratios. Among the author's main conclusions, their most robust result concerns the fact that government consumption (or investment) multipliers are country dependent. The multipliers don't only differ with country characteristics, but those characteristics are emphasized along with time: short-run multipliers reported small values are close to zero while medium-run and long-run variance. For instance, closed economies, fixed exchange rates, lower level of debts contributed to big fiscal multipliers, while open economies, flexible exchange rate regimes (closely related to the degree of response to shocks of monetary policy) or indebtedness states provided Nonlinear Fiscal Multiplier small multipliers and crowding-out effects. Similar results, concerning the heterogeneity and country dependent multipliers, can be found in Favero et al. (2011) who criticized the role of empirical research upon homogeneous fiscal multipliers and defended that the effect of fiscal multipliers differs across debt dynamics, degree of openness and fiscal reaction functions. Moreover, Hall (2009) highlighted the importance of the literature concerning the zero lower bound as a main source of nonlinearities, and he expressed this heterogeneity in multiplier phenomenon in these words:

"[Multipliers] are not fundamental structural parameters of the economy, invariant to the state of the economy. Quite the contrary, the multipliers are themselves endogenous. The state of the economy in 2009 is a perfect example. With extreme slack in the economy and the federal funds rate at essentially zero, there are good reasons to believe that the government purchases multipliers are higher than in normal times... [Rising] until 1.7 when monetary policies become passive with a zero nominal interest rate".

Their lines will make the crossing point of our next discussion concerning the research evolution towards heterogeneous multipliers.

3.2 Heterogeneous State Dependent Multiplier

In the light of recent idea of heterogeneity and state-dependent fiscal multiplier, a new approach has come forth due to criticisms of the limited role that a homogeneous multiplier would play in policy advising activities. Moreover a new question started to be regarded as a major component in a new research trend in macroeconomics: is the fiscal multiplier, despite being heterogeneous, dependent upon the business cycle position of the economic activity? This estimate has a Keynesian inspiration related to the counter-cyclical effects of financial policy and abides by the hint that one should consider the effects of an expansionary fiscal policy mainly during recessionary periods. The gist of the recent literature on this heterogeneity issue has effectively been to echo earlier Keynesian arguments that government spending is likely to have larger expansionary effects in recessions than in expansions. Intuitively, when the economy has slack, expansionary government spending shocks are less likely to crowd out private consumption or investment. To the extent discretionary fiscal policy is heavily used in recessions to stimulate aggregate demand, the key empirical question is how the effects of fiscal shocks vary over the business cycle. The answer to this question is not only interesting to policymakers in designing stabilization strategies, but it can also help the economics professionals to reconcile conflicting predictions about the effects of fiscal shocks across different types of macroeconomic models.

Naturally, this has a disadvantage, not only that researchers have less available data about deep recessions, but also because most of the work in economics are done under a linear approach, which is much less expensive in terms of computational and numerical methods. Parker (2011) was one of the first authors who highlighted this discussion, where he presented

the reasons for the lack of knowledge and a possible methodology for improving the estimate of the efficacy of fiscal policy in recessions. He pointed out two main drawbacks of the methodologies that are currently used to estimate the fiscal multiplier. In the first place there is a methodological problem. Both the DSGE and VAR models do not highlight the importance of the fiscal multiplier in recessions and the state fiscal multiplier is as effective in recessions as in expansions, because these methods do not allow for state dependence. The second problem concerns the measurement error, because even a researcher who seeks to calculate the fiscal multiplier in recessions is, in fact, calculating the margins and not the total multiplier, which will lead to biased results about the magnitude of the fiscal multiplier in response to a shock. In sum, Parker (2011) defended that researchers should invest their time on estimating the multiplier in a recessionary regime:

"We don't have a good measure of the effects of fiscal policy in a recession because the methods that we use to estimate the effects of fiscal policy, almost entirely ignore the state of the economy and estimate the government multiplier, which is presumably a weighted average of the one we care about the multiplier in a recession and one we care less about the multiplier in an expansion."

Evidence suggested that they tend to vary over time and across countries. They also depend on the state of the business cycle, the economic fundamentals, and the type of fiscal instrument used, among other factors. The empirical evidence is extensive for advanced economies but less so for MENAP countries. Estimates for advanced economies suggest that key determinants for the size of fiscal multipliers included the state of the business cycle, "leakages" through imports, the marginal propensity to consume, the prevalence of Ricardian Equivalence, and exchange rate flexibility. More recently, Christiano et al., (2010) argued that government spending multipliers tend to be higher under a binding zero lower bound on interest rates. Blanchard and Leigh (2013) suggested that fiscal multipliers may have actually been higher than previously estimated, particularly since the onset of the global financial crisis in advanced economies with binding zero-bound constraints on interest rates. Although MENAP countries have not faced a zero lower bound on interest rates, they exhibit other important characteristics which may imply larger fiscal multipliers. First, households tend to face binding liquidity constraints and have limited access to financial markets, which may imply that consumption

depends more on current income, and that investment depends more on current rather than future profits Eggertsson and Krugman (2012). Second, MENAP countries frequently exhibit sizable economic slack, as reflected in negative output gaps and high levels of unemployment. Both of these characteristics suggest that any crowding out of private sector activities due to government spending could be potentially limited, thus implying higher fiscal multipliers (Blanchard and Leigh 2013).

3.2.1 Theoretical Contributions

As presented, this new line of research rests upon (old) Keynesian views, when it defends that during a recession period the market fails and these failures can be (partially or fully) corrected by a temporary and expansionary fiscal policy, which will bring idle resources back to work. Usually, this would not happen during expansion periods, since Fiscal Policy would mainly raise price levels and interest rates, which would in turn crowd out private consumption and investment, as the Neoclassical models have systematically pointed out. Parker (2011) also explained how difficult it is to believe that a positive fiscal shock produces the same symmetric response on the economy as a negative fiscal shock, when the economy presents completely different characteristics affecting employment rates and capacity of utilization, respectively, low in recessions and higher in expansions. As Ramey (2011) stated, the key question in recent research is not how big fiscal multipliers are when the economy is in the steady state, but how big they are when it starts with idle resources. Nevertheless, to the best of our knowledge, few theoretical examples of this recent literature can be found yet. Castro et al. (2013) used a DSGE model in a small open European economy, obtaining different results for "normal times" versus "crisis times" after a negative fiscal shock. This work gains relative importance since it studies specifically the Portuguese fiscal multiplier during a period of crisis and budget consolidation, where it is assumed that the government implements a credible fiscal consolidation, implying a permanent decrease in the debt to GDP ratio in the long run. The authors "crisis time" definition concerned a significant set of calibrations which are representative of the "Great Recession Period". Their main result suggested that the fiscal multipliers in the short run are state dependent and that during the crisis times they equal approximately 2 for a consumption-based fiscal consolidation. In order to defend a state dependent fiscal multiplier the authors explained how during expansions the effect of an expansionary policy is more likely to be absorbed in

nominal terms, while in recessions its effects are of a real nature. The main argument is based on the existence of frictions in wages and prices in general. There are low frictions in a positive adjustment of wages, so in expansions the fiscal multiplier is observed by the nominal increase in the price of the labor market. On the other hand, wages, present some frictions when they have to adjust downwards, so there is a real effect on the adjustment process upon the level of employment. The authors generalized this argument for the whole economy, considering four main assumptions in their model (i) non-Ricardian agents (ii) strong nominal rigidities (iii) hand-to-mouth households and (iv) financial frictions. Thereby, suggesting not only a state-dependent fiscal multiplier but also a sufficiently positive one, since it nearly doubles in crisis times for expenditure-based fiscal consolidation and increases between 30 to 60 percent for revenue-based fiscal consolidations. In sum, the effects are large under an expenditure-based multiplier because it affects directly the level of GDP, while the revenue-based affects, in the first place, the available income and wealth and only later on it will indirectly affect the GDP level. Finally, the effects are also more persistent during crisis times since the nominal rigidities are high enough to create real rigidities. While their work is focused on negative short run effects to achieve a credible fiscal consolidation, Almeida et al. (2011) highlighted the tradeoff between the short-run costs with losses in output, consumption and welfare and the long-run benefits with significant increases in the level of output, consumption and welfare improvements. More recently, Michailat (2014) adapted a search and matching framework for a New Keynesian model and defended that the government multiplier doubles when the unemployment rate rises from 5 to 8 percentage points. However, this government multiplier only concerned the government spending on public-sector workforce, naming it by "public-employment multiplier", which will provide the information about how many workers are employed per one worker employed in the public sector. His main argument concerns the defense of a higher efficiency of government hiring during recession times, since the crowding-out effect is lower than in expansions. The results highlight two important conclusions. In the first place, the author reinforces how state-dependent the government multipliers seems to be, which implies that studying an average multiplier seems of little relevance in terms of policy implications. In the second place, the author found a significant heterogeneity in different types of spending multipliers, which suggests the need for a closer look at this issue when it comes to policy making.

3.2. 2 Empirical Contributions

One of the first authors who addressed this topic with an empirical approach are Auerbach and Gorodnichenko (2012). These authors, by defending the importance of studying the magnitude of the fiscal multiplier in recessions, provided two main results which started a new research trend. In the first place, they implemented a regime-switching model (STVAR) to study the magnitude of the fiscal multiplier, concluding that although the multipliers are similar in terms of impact (either in recessions and expansions), the impulse responses imply different cumulative multipliers that go from 0 to 0.5 in expansions and from 1 to 1.5 during recessions for the US economy, over a significant sample period between 1950 and 2010. This paper by showing how the different dynamics of macroeconomic variables are under a linear and nonlinear models, showed the importance of this line of research for short run analysis and policymaking. Thereby, together with the discussion paper of Parker (2011) and these new results of AG12, a literature that studies the heterogeneity, state dependency and country specific fiscal multipliers were reborn.

In line with the traditional Keynesian theory, given slack resources in the economy, fiscal expansions may be more effective at increasing output in recessions than during normal times. Conversely, it has been claimed that fiscal consolidation can have a deeper negative impact on output during recessions. For instance, the effect of nominal price and wage rigidities may be greater during recessions than during boom periods, as prices and wages tend to adjust downwards more slowly on account of institutional factors, among other factors. Greater nominal rigidities generally lead to larger fiscal multipliers, as adjustment of weaker demand occurs through output and employment instead. In another work Auerbach and Gorodnichenko (2012) the same two authors used a direct projection method to estimate the multipliers for a panel of countries, concluding that government spending shocks crowd out private consumption and private investment in expansions but stimulate them in recessions. Also, they reported a negative response of exports and a positive response of imports which are marginally positive in the recessionary regime. Along with these results they also estimated an "employment multiplier", the results of which are comparable to the ones presented by Michailat (2014). The results reported for the labor market wages are also consistent with Castro et al. (2013) assumptions about real and nominal rigidities, since the authors defended that a positive expenditure shock is absorbed by a higher employment level in recessions and by a higher labor wage in expansions. Another important issue to be highlighted, concerned the output response to

the government debt: higher government debt leads to a smaller response in the output. In sum, this paper strengthened the recent conclusions that spending multipliers vary across the business cycle, thus in order to achieve a higher efficiency, policy makers should take into account that the fiscal multiplier seems to be much larger in recessions than in expansions. Moreover, the trade-off effects of this policy, like the crowding-out effect of private investment or the inflationary pressure, are also less likely to happen under deep recessionary regimes than in expansion times. Further evidence for the US economy can be found, for example, in the work of Mittnik and Semmler (2012), who estimated a regime dependent VAR with two regimes. The authors found clear evidence that the "timing" is crucial for policymakers, since there are significant differences in the responses of output and employment to demand and labor supply shocks. A positive demand shock, in a below average growth regime, produces a multiplier effect on output and on employment growth that is higher when compared to the situation of a high-growth regime.

Because the recent financial crisis is a complex phenomenon, Cos and Moral-Benito (2013) disaggregated the concept of crisis to match the problems of the Spanish economy. By using a STVAR analysis similar to AG12, they began by analyzing, in the first place, the traditional expansion/recession dichotomy, reaching standard conclusions that are the spending multiplier is larger during recessions, but irrelevant during expansions as well as a low crowding-out effect for private consumption and investment during recessions. Secondly, as part of the disaggregate analysis, they analyzed two different fiscal scenarios: "good" and "bad". One important debate concerned the role of expectations when there is a weak public finance situation, which is also a characteristic of the Portuguese financial case. Is it possible that an expansionary fiscal multiplier during bad fiscal times contributes to change the sign and magnitude of the fiscal multiplier? The answer is yes. The authors found out, that under a bad financial situation, the effect of government spending shock becomes close to zero, which is in line with the results previously defended by Corsetti et al. (2012). Moreover, the authors also provided results for the dichotomy of banking stress versus no banking stress, where the spending multipliers are found to be larger during periods of banking stress but smaller than 1 for government spending. Finally, after studying all three situations separately, the authors combined them to create a proxy for turbulent times, concluding that despite the financial situation contribution to decreasing the cumulative spending multiplier, it is still sufficiently positive in

turbulent times. As a result of the possible benefits of policy advising, several researchers are now studying their own and different other countries' specific fiscal multipliers and obtaining standard results, with the output response to a government spending shock being higher during recessions than in expansions, as well as the crowding-out effect of private consumption or investment being less likely to happen during recession periods.

Studies on fiscal multipliers support the argument of state dependency of multipliers as Raq and Zeufack (2012) provided empirical evidence for Malaysia state-dependent fiscal multiplier. Monokroussos and Thomakos (2012) provided evidence for Greece in order to understand the potential output losses due to the austerity program the Greek economy is under since 2010. Herbert (2014), by following the AG12 approach, reproduced their results for the US, but also reported results for Italy, Germany and France. This former author found a strong evidence that the spending multiplier was strong during downturns in the US and France, the results had a low magnitude for Germany and were found inconclusive in Italy. Baum et al. (2012) found larger government spending and revenue multipliers when output gap was negative as compared to positive output gaps for six of the G7 economies. De Cos and Moral-Benito (2016) assessed specific multipliers from Spain that depend upon conditions of public finances, the health of the banking sector and the business cycle by using data from 1986-2010. They estimated spending multipliers were around 1.4 during crises situations and 0.6 during normal times. In a study closer to ours, Silva et al. (2013) also investigated positive spending multipliers for recessions and smaller even negative for expansions. Chouliarakis et al. (2013) found that during the negative output gap the impact multipliers was above 0.5 (and also significant) and during positive output gap the value of spending multipliers was very low and statistically insignificant. Ramey and Zubairy (2014, 2016) adopted the local projections method in a state-dependent model to examine the possibility of a different response of government spending changes in periods of recessions compared to expansions. Ramey and Zubairys' results showed that there is no evidence of heterogeneity. They both focus, on government spending shocks. However, it is important to mention that while the state variable for Auerbach and Gorodnichenko is a function of an endogenous variable (moving average of GDP), for Ramey and Zubairy their state is a dummy variable (which is 1 if the unemployment rate is above a specific threshold, i.e. 6.5%). The importance of this point will be cleared when the use of the local projections method is discussed. Barnichon and Matthes (2016), for example, study

whether the sign of a government spending shock matters. They find that an expansionary multiplier is below one, while the contractionary is above 1. Our paper (Which paper) contributes to the empirical literature of the study of fiscal multipliers by examining the potential for heterogeneous effects when one considers three dimensions of non-linearities related to "how", the "when" and the "initial condition" that an episode of scale adjustment is implemented. Several studies (e.g. Favero and Giavazzi (2007), Ilzetzi, Mendoza and Vegh (2013), Corsetti, Meier and Miller (2013)) have highlighted the importance of the government's fiscal position of a country. Omitting this dimension can bias the effects of fiscal shocks. Nickel and Tudyka (2014) estimated fiscal multipliers and take into account the country's fiscal position. They use an interacted panel vector auto-regression in a sample of European countries. Using a panel of 17 OECD countries, Corsetti et al. (2012) found that Fiscal multipliers are typically larger in countries with a fixed exchange rate regime, suffering a financial crisis, or under sound public finances. Along these lines, Ilzetzi et al. (2013) construct quarterly series of government spending for a panel of 44 countries and they found that the output effect of an increase in government consumption is larger in economies operating under fixed exchange rates. Ilzetzi et al. (2013) also found that negative multipliers can be observed in high-debt countries. Huidrom, Kose, Lim and Ohnsorge (2016) are a very recent paper that jointly accounts for the fiscal position and the business cycle, as we do (????). The main differences relied on the fact that I include debt endogenously in my model, and on the composition of the stabilization episodes. They use a Blanchard and Perotti (2002) identification scheme. Fiscal policy shocks have a reduced effect on the economic activity in emerging market. Mirdala (2009) evaluate the fiscal policy dynamic for six emerging economies: Czech Republic, Hungary, Poland, the Slovak Republic, Bulgaria and Romania in the period 2000-2008 and find fiscal multipliers positive, but small, while Cuaresma et.al (2011) also find fiscal multipliers small with different sign for Czech Republic, Hungary, Poland, the Slovak Republic.

Exchange rate regimes also affect the size of fiscal multipliers as Ilzetzi et al. (2013) and Chouliarakis et al. (2013) found larger multipliers for economies having fixed exchange rates than that of floating exchange rate regimes. Fiscal multipliers also vary from country to country and it depends upon different characteristics of the countries for instance, empirical estimations of Ilzetzi et al. (2013) for 144 countries (24 are developing countries) from 1960-2007 showed that government consumption multipliers were larger in industrial than in developing countries,

open economies had lower fiscal multipliers than closed economies, fiscal multipliers for high debt countries were also zero and finally government investment multipliers were larger than government consumption multipliers.

Thus, it seems to be well grounded that symmetric shocks have asymmetric effects depending on the fundamentals of the economy, for instance the business cycle position for advanced countries and the rate of growth in developing countries. From existing literature, it also seems that there is no consensus as to the size or the magnitude of the fiscal multiplier and therefore no consensus on the role of the fiscal policy as an efficient instrument. Even if one considers that researchers accept nonlinear elasticities, assuming that the multiplier is always higher during recessions than in expansions, is also a source of disagreement. The selected model, the way researchers report their results or even the transformation process from elasticities to multipliers constitute points of disagreement among researchers. Nevertheless, the results seem to point to higher multipliers in the short-run and medium-run during recessionary periods when compared to normal times. A more difficult point to formulate, which itself deserves a separate research, concerns the transmission channel of the fiscal shock. What exactly drives the fiscal shock to increasing output during recession periods that does not happen in normal times? Finally, the last point of disagreement concerns the crowding-out effects of private investment and consumption, and the long term effects on the welfare and sustainability of Debt-to-GDP ratio. This is the point where it seems that most researchers failed to find not only a consensus but also an empirical trend. Most papers, previously discussed, point out to a crowding-out effect on investment and consumption, lower during recessionary periods than in expansions. The articles addressing the sustainability of Debt-to-GDP ratio usually concludes that countries, which have higher ratios, usually present lower fiscal multipliers when compared to the ones who do not Cos and Moral-Benito (2013). These articles also concluded that the size of the output multiplier under recessions is crucial to succeed with an expansionary fiscal consolidation and to avoid a self-destructive austerity Castro et al. (2013).

Such studies are subject to several drawbacks. First, as pointed out in Parker (2011), there is a “lack of data” – deep recessions are few in most studies and related non-linearities hard to measure using macroeconomic data. Second, given that the non-linear models are

computationally more expensive, the reduced-form VARs are generally very simple and thus prone to omitted variable bias and other estimation challenges, such as the “fiscal-foresight problem” Leeper et al. (2008). Most VAR studies use only (non-adjusted) fiscal shocks (total spending and net taxes) and output. By omitting the channel of government debt accumulation, for instance, such studies may find over-estimated multipliers in recessions, in particular in highly indebted countries. Moreover, looking only at exogenous government spending in an extension of Ramey’s (2011) military news series for a period covering the 20th century in the United States, Owyang et al. (2013) did not find evidence that multipliers are greater during periods of high unemployment in the United States. The estimated multipliers are also below unity. Third, results are subject to sizeable uncertainty, particularly in studies using threshold VAR in which the threshold variable (e.g. Potential output) is in itself subject to uncertainty and data revisions. This can add significant noise to the regime switching and complicate the already difficult task of computing non-linear impulse reaction functions after a fiscal shock.

While studying literature on the mentioned area there are few studies about the investigation of fiscal policy effects and size of multipliers, but they lack research on state dependent fiscal multipliers especially in Pakistan economy. Javid and Arif (2009) traced the dynamic effects of government spending on economic activity in Pakistan. Using a vector autoregressive model for data set for a period of 1971-2008 they documented results as, change in government spending is negatively related to consumption and output. Expansionary fiscal policy leads to increase in interest rate. While the exchange rate appreciated when there is an increase in government spending. Hayat and Qadeer (2016) studied about the size and impact of fiscal multipliers in selected South Asian countries including Pakistan. They used the panel autoregressive method to obtain accumulated impulse response function for the period 1982-2014. Their study revealed that government spending has significant positive impact on output. Furthermore, the study found that government investment multipliers are higher than government consumption multipliers. The study suggested that government expenditures have greater multiplier value in recession as compared to expansion or boom.

CHAPTER 3

CHAPTER 3

Methodology and Model Specification

This chapter will discuss about the adopted methodology and its specifications. The main objective of this study to check the influence of fiscal policy measures tax revenue and final expenditure on output in two states of the economy e.g. high and low growth state. First, ordinary least square (OLS) model is used for estimating the relationship among the variables. Second, a categorical variable is introduced in above regression for the identification of regime shift. Third, interactive terms included in the above regression for estimation of influence of these variables in different regimes. Forth, To estimate impulse responses Jorda's (2005) local projection method is used.

In literature unemployment rate, capacity utilization, growth rate and the output gap are used to measure the slackness of the economy. Like Auerbach and Gorodnichenko (2012) and Cebi and Ozdemir (2016) we use average (median) of the real GDP growth rate as a threshold to determine the state of the economy

The median of growth rate series of Pakistan economy is taken as threshold in this study to distinguish the low growth and high growth state of economy. It is supposed that if the average of real gdp growth rate is greater than the particular year real gdp growth rate, it will be the low growth year and vice versa. There are three different frameworks for the identification of fiscal policy shocks. These frameworks are VAR based fiscal shocks, forecast error for growth rate of govt spending and narrative approach, based on the news related to expected spending. In our study to model fiscal shock we used three variables VAR based framework according to Cholesky decomposition.

3.1 Ordinary Least Square (OLS) Model

Ordinary least square (OLS) model is most practiced technique to find out the association between the variables. Ordinary least square model can be used when we have categorical

variable as an independent variable. We will use OLS model to estimate the magnitude of association between the variables.

The general form of ordinary least square model is following

$$Y_t = \beta_0 + \beta_i \sum_{i=1}^n X_i + \varepsilon_t \dots\dots\dots (1)$$

Where $i = 1, 2 \dots n$

In equation Y_t is representing the dependent variable and X_i is for the independent variable. ε_t is for the error term. β_0 and β_i are showing the parameters.

In our study, we have three growth series in which GDP growth rate (GDPG) is dependent and tax revenue (TRG) and final expenditure (FEG) growth series are independent.

The functional form for our study is

$$GDPG = f(TRG, FEG) \dots\dots\dots (2)$$

So the econometric model for our study is

$$GDPG_t = \beta_0 + \beta_1 TRG_t + \beta_2 FEG_t + \varepsilon_t \dots\dots\dots (3)$$

3.2 Ordinary Least Square Model with Regime Shift Dummy

One of the main objective of our study is to identify the regime shift in GDP growth series, for this purpose, we introduce a categorical variable in our regression model. We divide the GDP growth series into two regimes, high and low growth regimes.

The categorical variable is indicating

$$D_i \begin{cases} 1 & \text{low growth} \\ 0 & \text{high growth} \end{cases}$$

We introduce this dummy variable into the equation (3)

$$GDPG_t = \beta_0 + \beta_1 TRG_t + \beta_2 FEG_t + \delta_1 D_i + \varepsilon_t \dots\dots\dots (4)$$

Now if the dummy is zero equation will be

$$GDPG_t = \beta_0 + \beta_1 TRG_t + \beta_2 FEG_t + \varepsilon_t \dots\dots\dots (5)$$

When ($D_i = 0$) then the average rate of growth is measured by the value of (β_0) which is representing the mean value of regression when all the independent variables are going to zero.

If the dummy is 1 then the equation will be

$$GDPG_t = \beta_0 + \beta_1 TRG_t + \beta_2 FEG_t + \delta_1 D_i + \varepsilon_t \dots\dots\dots (6)$$

But when ($D_i = 1$) then the average rate of growth is measured by the sum of dummy coefficient and constant values ($\beta_0 + \delta_1$).

3.3 Ordinary Least Square Model with Interaction Terms

The main objective of this study to analyze the impact of fiscal policy tools on GDP growth in different regimes. We introduce the interaction terms of both independent variable in our regression model. We multiply the dummy variable with both independent variables. We measure the influence of these fiscal policy tools in low and high growth regimes.

$$GDPG_t = \beta_0 + \beta_1 TRG_t \times D_i + \beta_2 FEG_t \times D_i + \varepsilon_t \dots\dots\dots (7)$$

These interaction terms indicate us about the influence of these fiscal policy measures in both regimes.

3.4 Impulse Response Function

The econometric tools are commonly used to estimate the stochastic associations between the different economic variables. The impulse response function is mostly used to find a dynamic relationship between the variables and specially, for projections. Impulse response function involved many steps. First, vector autoregressive (VAR) model, second, lag length selection and at the third impulse response function.

3.4.1 Jorda's Local Projection Method

This methodology is being used in recent research like Auerbach and Gorodnichenko (2013) to estimate state dependent fiscal multipliers. Similarly, Owyang et al. (2013) and Ramey and

Zubairy (2014) applied this technique to calculate regime dependent fiscal multipliers. The same technique is also used by the Erba et al. (2014) for the estimation of state dependent fiscal multipliers. Auerbach and Gorodnichenko (2013) and Ramey and Zubairy (2014) mentioned that local projection method has the following advantages as compared to other techniques. In this method; First, we can simply familiarize non-linearity in model to calculate state dependent fiscal multipliers. Secondly, this method does not restrict the shape of the impulse response function. Thirdly, this method uses parsimonious specification so there is no need to estimate the equation of dependent variables that are not the focus of the particular study. This method also allows government expenditures to change the regime of high growth state to low growth state and vice versa. Also, there is no need that variable on the both sides of the equation to have a similar form as like in the VAR.

The generalized form of VAR (p) model at P_{th} lag is

$$Y_t = B_0 + B_1Y_{t-1} + B_2Y_{t-2} + \dots + B_pY_{t-p} + e_t \dots\dots\dots (8)$$

Y_t is a Kx1 column vector of variables. B_0 is the column vector of constants. B_i is time invariant coefficient matrix of K x K order. e_t is K x 1 column vector of error terms.

Now for our study the VAR (1) model is

$$\begin{bmatrix} GDPG_t \\ TRG_t \\ FEG_t \end{bmatrix} = \begin{bmatrix} \delta_{10} \\ \delta_{20} \\ \delta_{30} \end{bmatrix} + \begin{bmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{bmatrix} \begin{bmatrix} GDPG_{t-1} \\ TRG_{t-1} \\ FEG_{t-1} \end{bmatrix} + \begin{bmatrix} e_{GDPG,t} \\ e_{TRG,t} \\ e_{FEG,t} \end{bmatrix} \dots\dots\dots (9)$$

The true lag length can be determined after estimations. The reduced form of this VAR model is

$$Y_t = \delta_0 + B_1Y_{t-1} + e_t \dots\dots\dots (10)$$

State dependent model is given as follows

$$x_{t+h} = I_{t-1} [\alpha_{A,h} + \Psi_{A,h} (L)y_{t-1} + \beta_{A,h} shock_t] + (1 - I_{t-1}) [\alpha_{B,h} + \Psi_{B,h} (L)y_{t-1} + \beta_{B,h} shock_t] + \text{linear trend } \varepsilon_{t+h}$$

Variables of interest of this study are shown by the x while “y” denotes the vector control variables. L is the polynomial of order 4, and shock in this study is the Vector autoregressive based government spending shock. Variable x consists on the output and government spending.

Lags of the log values of the output, the y . shows government spending, and taxes. To capture the state of the economy dummy I is used.

At time $t+h$ the coefficient β shows the response of variable x to the shock at time period t . so we can construct the impulse responses for each horizon by estimating a set of regressions. In this model, we have constants ($\alpha_{A,h}$ and $\alpha_{B,h}$) and linear trend. Model given in the above equation allows to change in the coefficients as per the state of the economy. To remove the possibility of possibility of serial correlation in the error terms, following the Ramey and Zubairy (2014) we use the Newey West correction for the standard error.

3.4.2 Lag Length Selection Criteria

There are different criteria prevailed for lag length selection, but it is not easy to select a proper lag length. The most common criteria are AIC, SBC, HQ, FPE and LR. We choose our lag length on the basis of these criteria. If we find any contradiction then we will select lag length on the basis of language multiplier (autocorrelation) test. We use language multiplier test for lag selection, if we found contradiction among the different lag selection criteria, it could be more effective and easy to select a lag value, where we get no autocorrelation in the model.

3.5 Data and its Description

Tax revenue, final expenditure and GDP in dollars and growth series of these variables is used in our analysis. The sample data is taken for the period of 1980 to 2015. We have 35 observations at hand. Data are taken from the reliable data portal of World Development Indicator (WDI). Data in dollars is converted into a log form to use in Jorda's Local projection Method and obtain Local Impulse Responses. The growth rates are estimated from this formula

$$\text{Growth rate} = \frac{y_t - y_{t-1}}{y_{t-1}}$$

Y_t is the current value.

Y_{t-1} is the previous value.

CHAPTER 4

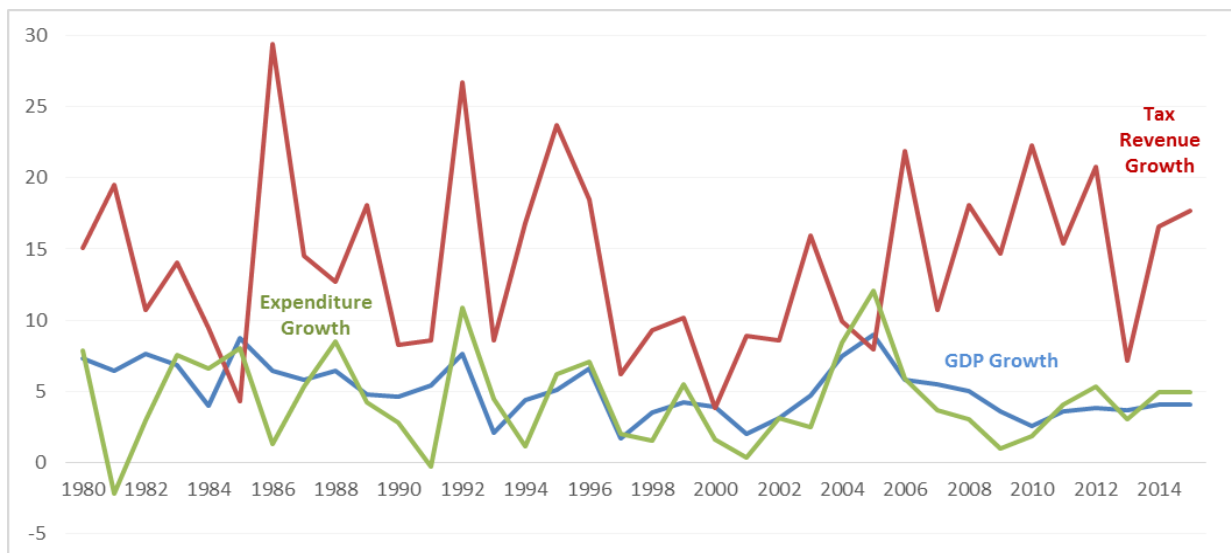
Estimations and Analysis

In this chapter estimations and analysis of the variables are presented. These estimations are providing for the justification of the objectives of the study. After analyzing the results, this study concluded that fiscal policy variables impact the GDP growth, also explored that the series of GDP growth is experiencing with regime shifting. Furthermore study found that the fiscal policy variables are more effective in low growth regime as compared to the high growth regime in Pakistan economy. The conclusion is that, authorities could use fiscal policy for stimulating and stabilizing growth rate in the economy especially in the period of low growth.

4.1 Graphical analysis

We have data from the period of 1980 to 2015 on annual percentage Growth rates. The data contain growth series of final expenditure, tax revenue and GDP.

Graph 1: Growth series



The graph 1 shows the growth (annual %) series of tax revenue, final expenditure and gross domestic product. All the series are moving around the mean value, in other words, they have mean reversion behavior that is why they would be stationary.

4.2 Summary of Statistics

Table 1 shows the descriptive statistics of growth series of tax revenue, final expenditure and GDP, which reveal some indications about the nature of growth series. The distributions of the growth series are seeming normal. Mean value shows the average value, so the average growth rate of tax revenue, GDP and final expenditure are 14.021, 5.036 and 4.361 percent respectively.

Table 1: Summary Statistics of growth series

Series	Tax Revenue	GDP	Final Expenditure
Mean	14.021	5.036	4.361
Maximum	29.412	9.000	12.086
Minimum	3.806	1.700	-2.179
Std. Dev.	6.278	1.854	3.153
Skewness	0.495	0.263	0.373
Kurtosis	2.594	2.389	2.862
Jarque-Bera	1.722	0.975	0.866

The standard deviation shows the deviation from the mean value, so the tax revenue series is more deviating from the mean as compare to other series. Skewness indicates about the asymmetry of distribution, its value is close to zero, it means distribution is symmetric. Kurtosis deals with peak of the distribution, its value is close to 3 it means distribution peaks are normal. Jarque-Bera is normality test, the results are insignificant which indicates that the series are normal.

4.3 Unit root testing

To validate our visualization, we employed unit root testing. The results in table 1 shows that all the series is stationary at level.

Table 2: unit root testing of growth series

Series	Tax Revenue	GDP	Final Expenditure
At Level	-3.9579 (0.0043)	-5.4789 (0.0001)	-6.4224 (0.0000)
ADF H0: Series is non-stationary, Asymptotic significant values of ADF test are 1% (-2.56572), 5% (-1.94093) and 10% (-1.61663).			

The P-values are given in the parenthesis.

4.4 Regression analysis

We employ the linear regression model to find out the degree of association among the dependent variable GDP growth and independent variables tax revenue growth and final expenditure growth. The results are given in table 2, indicate that all the parameters are significant except tax revenue. The sign of the coefficient of final expenditure is positive, it means final expenditure is positively associated with GDP growth, which shows that if authorities use fiscal expenditure tool and increase expenditures, it will cause an increase in growth rate in the economy. The P-value of final expenditure is 0.001 which is less than level of significance 5%, it shows that final expenditure is statistically significant. The coefficient value of final expenditure is 0.295, which indicates that if we increase final expenditure 1 percent the GDP growth with increase 0.29 percent.

Table 3: Linear regression among growth series

Variable	Coefficient	Standard Error	T-value	P-value
Constant	2.145	0.882	2.429	0.021
Final Expenditure	0.295	0.083	3.517	0.001
Tax Revenue	0.020	0.041	0.485	0.630
GDP(-1)	0.254	0.143	1.770	0.086

The P-value of constant is 0.021 which is less than the level of significance 5%, it shows that constant is also statistically significant. The constant of regression shows that if all the independent variables are going to zero, then the mean value of regression is 2.145. The lag value of the dependent variable is insignificant at 5%, but significant at 10%. The lag value is added in regression for the treatment of autocorrelation. The R^2 value is 0.3925, it shows that the dependent variable is 40% explained by the independent variable final expenditure. The Durbin Watson test value is 1.80 which clearly indicates that there is no autocorrelation.

4.4.1 Residual analysis

For the validation of regression and Durbin Watson test results, we employed the langrage multiplier test for the detection of serial autocorrelation.

Table 4: langrage multiplier test for autocorrelation

Test	Estimated value	P-value
F-statistics	0.1391	0.870
Chi-square statistics	0.3326	0.846

The P-values of both tests are greater than the level of significance which means that we can't reject null hypothesis of there is no autocorrelation.

4.5 Regression with Regime Shifting dummy

After simple linear regression analysis a dummy variable is included in regression model. In dummy variable "1" means (low growth) and "0" shows (high growth). Dummy captures the regime shift effect in dependent variable and the threshold level is selected by calculating median of GDP growth series which is around 4.7 percent.

The results in table 5 shows that the dummy variable is significant which means that there is regime shift in GDP growth series. All the variables are significant except tax revenue. The P-

value of final expenditure is 0.003 which is less than level of significance 5%, it shows that final expenditure is statistically significant. The coefficient value of final expenditure is 0.174, which indicates that if we increase final expenditure 1 percent the GDP growth with increase 0.174 percent.

Table 5: linear regression with regime shift dummy

Variable	Coefficient	Standard Error	T-value	P-value
C	3.261	0.444	7.329	0.000
Final Expenditure	0.174	0.055	3.129	0.003
Tax Revenue	-0.022	0.026	-0.835	0.409
DG	2.655	0.362	7.334	0.000

The P-value of constant is 0.000 which is less than level of significance 5%, it shows that constant is also statistically significant. The P-value of dummy for low growth is 0.000 which is less than level of significance 5%, it shows that dummy for low GDP growth is also statistically significant. In this regression constant value shows the average shift in GDP growth in case of high growth which is 3.261 percent. But when growth is low there is a shift of $3.261+2.655=5.86$ on average. It means the magnitude of shifting is greater in case of low growth. This greater shift indicates the large impact of fiscal policy tools (Expenditures and Tax revenues) or simply large fiscal multipliers in low growth regime compared to the high growth period. Shift in GDP growth rate with significant magnitude in low growth is in support of Keynesian view point that when the economy has more idle resources or economic slack or positive output gap the effect of fiscal policy instruments (especially government spending) is greater and size of fiscal multiplier larger in comparison to a state of economy when here is no economic slack and economy is working at its full capacity. The R^2 value is 0.75, which means that the dependent variable 75% explained by the independent variables. The Durbin Watson test value is 2.13, means there is no autocorrelation.

4.5.1 Residual analysis

We employed the language multiplier test for the detection of serial autocorrelation. The results are given in table 6 given below

Table 6: language multiplier test for autocorrelation

Test	Estimated value	P-value
F-statistics	0.302	0.741
Chi-square statistics	0.711	0.700

The P-values of both tests are greater than the level of significance which means that we can't reject the null hypothesis, that there is no autocorrelation.

4.6 Linear regression with interaction terms

We introduced two interaction terms in the regression model to analyze the effect of independent variable tax revenue and final expenditure in low and high growth regimes. The results in table 7 show that the interaction terms are significant which means that the GDP is affected by the tax revenue and final expenditure in low and high regimes.

Table 7: Linear regression with interaction terms

Variable	Coefficient	Standard Error	T-value	P-value
C	3.787	0.253	14.938	0.000
DG x Tax Revenue	0.048	0.025	1.950	0.059
DG x Final Expenditure	0.308	0.060	5.099	0.000

The P-value of constant is 0.000 which is less than the level of significance 5%, it shows that constant is also statistically significant. The P-value of the interaction term of tax revenue is 0.059 which is greater than the level of significance 5%, it means it is insignificant at 5% but we can consider it significant at the 6% level of significance. The P-value of the interaction term of final expenditures is 0.000 which is less than the level of significance 5%, it means it is

significant at 5%. In this regression constant value shows the average shift in GDP growth in case of high growth which is 3.787 percent. In case of low growth the GDP growth is affected by the tax revenue $3.787+0.048 = 3.835$ percent and $3.787+0.308 = 4.095$ percent from final expenditure, which is a clear indication of high fiscal multipliers in low growth regime as compared to high growth and supporting the Kenysian view about the fiscal policy effectiveness in existence and lack of economic slack in the economy.

4.6.1 Residual analysis

We employed the langrage multiplier test for the detection of serial autocorrelation. The results are given in table 8 given below

Table 8: langrage multiplier test for autocorrelation

Test	Estimated value	P-value
F-statistics	1.454	0.249
Chi-square statistics	3.088	0.213

The P-values of both tests are greater than level of significance which means that we can't reject null hypothesis of there is no autocorrelation.

4.7 Impulse response function

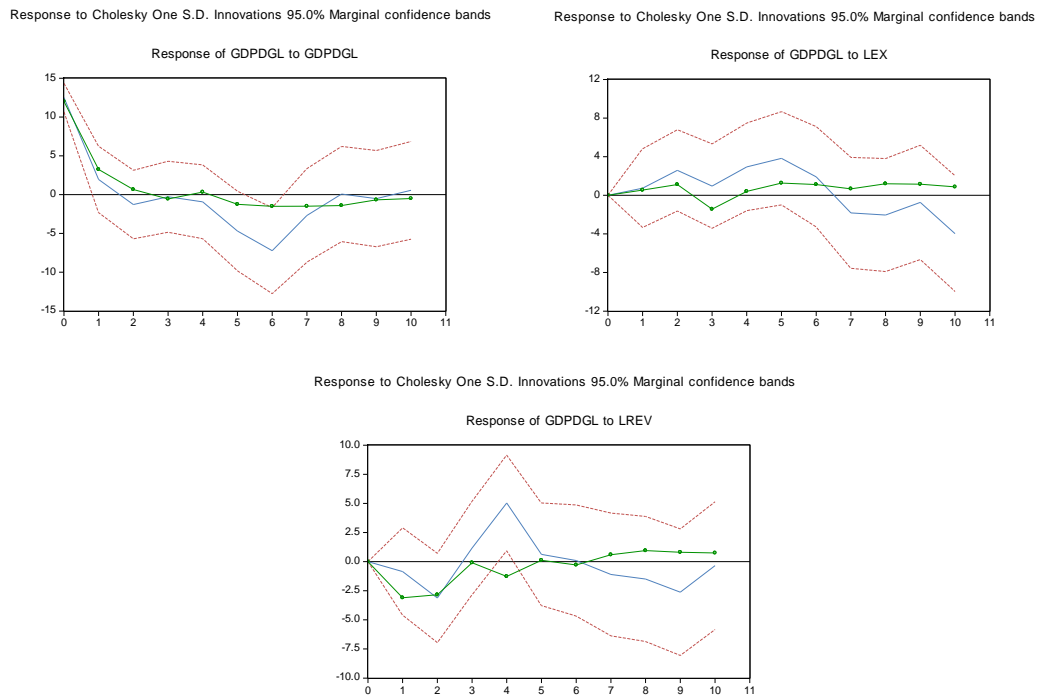
The econometric techniques are employed to evaluate the stochastic relationships among the economic variables. Few steps are involved in impulse response evolution. First, run vector autoregressive (VAR) model. Second, lag length selection and at third stage the local impulse response function. First, we employed a VAR model to check the interdependence among the selected variables. We got interdependence among the variable at some extent. Second, we used langrage multiplier test for lag selection, due to the contradiction among the different lag selection criteria, it could be more effective and easy to select a lag values, where we get no autocorrelation in the model. That is why we selected four lag value and residual analysis indicated that there is no autocorrelation in the model. Third, after validation of our VAR model

results, we employed Jorda’s local impulse response function and graphical results are given in sections below .

Graph 2: Graphical presentation of Impulse Response function

1. Local Impulse Responses in Low Growth State

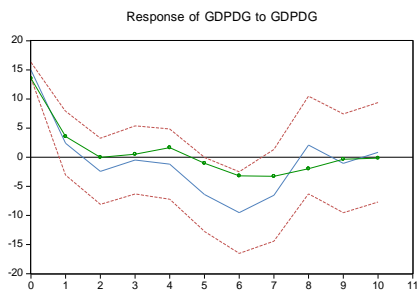
Impulse responses of the variables indicate the response to one standard deviation shock to the system. In this section, we have analyzed the response of GDP to one standard deviation shock in government final expenditures and Tax revenues in low growth periods. Graphs of impulse response show that if there is a shock given to government expenditure causing the GDP to increase for 6 periods and peaks at 4th year. Furthermore, it starts decreasing after 6 periods. While a shock to Tax revenue cause to decline in GDP for 3 periods, then become positive for 4th period and again tends toward a declining trend. After 6th period, GDP again becomes negative. These impulse responses show that a shock to both the fiscal policy tools affect the GDP significantly in low growth periods of Pakistan economy or alternatively we can say large fiscal multipliers are indicated by these results in periods when the economy has an economic slack.



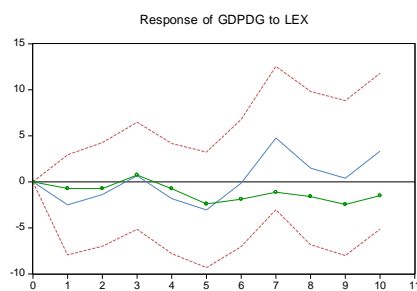
2. Local Impulse Responses in High Growth State

In this section impulse responses of GDP to fiscal policy tools are presented, while considering the periods of high growth in Pakistan economy. Graph of GDP response to government expenditure here indicates that, if one standard deviation shock given to expenditures in high growth periods will cause to a decline in GDP significantly, this can be due to a reason that the economy is working at its capacity. In a situation when the economy has no slack, then spending becomes a cause of crowding out and decline in output. Similarly, taxes act accordingly and prove to be less effective in high growth regimes compared to that of high growth periods we discussed in the previous section. If one standard deviation shock is given to tax revenues will cause to decline, GDP initially, then increase and then decrease for 2 periods and ultimately causing a positive impact on GDP after 4th period.

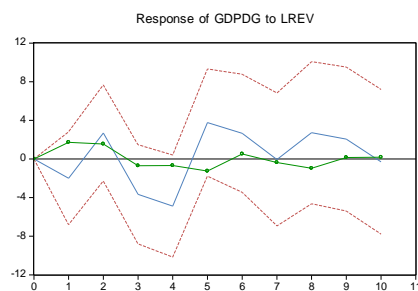
Response to Cholesky One S.D. Innovations 95.0% Marginal confidence bands



Response to Cholesky One S.D. Innovations 95.0% Marginal confidence bands



Response to Cholesky One S.D. Innovations 95.0% Marginal confidence bands



While making a comparison of results produced with low growth and high growth regimes we can see that the impact of fiscal policy tools in low growth periods (when the economy has a slack or potential) is very high and significant as compared to the impact of these policy tools in

high growth periods (in which economy has not significant economic slack) and become a cause of reduction in output, which can be attributed to the crowding out effect of fiscal policy tools.

After the analysis of all the results, we concluded that GDP growth has relation with different fiscal policy measures. We found that GDP growth series is experiencing with regime shifting. We also found that the variables are affecting more in low growth regime as compared to high growth regime. The conclusion is that we can use these measures as a tool for stimulating our economic growth particularly in low growth periods.