IMPACT OF FISCAL POLICY UNCERTAINTY ON MACROECONOMIC

PERFORMANCE

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<u>CERTIFICATE</u>

This is to certify that this thesis entitled: **"Impact of Fiscal Policy Uncertainty on Macroeconomic Performance."** submitted by **Ms. Amna Riaz** is accepted in its present form by the School of Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in Master of Philosophy in Economics and Finance.

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ABSTRACT

I empirically investigate the impacts of government spending uncertainty on private investment using panel autoregression (PVAR). Firstly, I untangled public spending and public spending volatility shock by using GARCH (1) process and examined the impacts of government spending volatility shocks on private investment and on other macroeconomic variables by using PVAR. I also have checked the impacts of fiscal variables (Government expenditure, Government debt and tax receipts) on key macroeconomic performance by using fixed effect and random effect models. I considered panel data for 122 countries according to their income level. I divided countries in 2 groups, upper-middle-income countries and low- middle income countries respectively. The sample Period is annual and range from 2000FY to 2019FY. Employing analysis of panel data technique with random effect and fixed effect model, I investigated that fiscal variable negatively affecting macroeconomic performance. In the whole sample all the variables decline due to uncertainty in fiscal variables. Moreover, employing analysis of Panel vector autoregression on panel data to find out the impact of government spending uncertainty shocks on private investment, I documented that in overall sample private investment decreases due to uncertainty shocks in government expenditure. Private Investment decreases due to one standard deviation shock in government spending expenditure. Results from upper-middle-income countries also revealed that due to one standard deviation shock in government spending uncertainty, private investment falls. Although in low middle-income countries uncertainty in government expenditure has a positive impact on private investment. I also examined that in the overall sample and in upper-middle-income countries private investment and inflation decrease due to uncertainty shocks in government expenditure. While in lower-middle-income countries consumption and inflation decreases due to uncertainty shocks in government spending. Briefly, I find that the impact of Government spending uncertainty on private investment is not negligible, uncertainty in government spending significantly lower Private investment, consumption, and inflation.

Keywords: Government spending volatility shocks, Panel autoregression (PVAR), Private investment, Fiscal variables, Macroeconomic performance.

Author's Declaration

I Amna Riaz hereby state that my MPhil thesis titled "Impact of fiscal policy uncertainty on macroeconomic performance" is my own work and has not been submitted previously by me for taking any degree from Pakistan Institute of Development Economics or anywhere else in the country/world.

At any time if statement is found to be incorrect even after my Graduation the university has right to withdraw my MPhil degree.

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Amna Riaz.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

There are many macros as well as microeconomic variables that create uncertainty in the fiscal policy. Taxes and the Expenditures are the two main tools of the Fiscal policy. To take fiscal policy in the right direction Government may adjust these two tools. The government budget as a whole is affected by the fiscal budget, leading to changes in key macroeconomic variables such as inflation, unemployment, interest rates and GDP (Serfraz and Anwar 2009).

Fiscal policy affects the country's overall economy. To stabilize the economy, the government can save more money to be used in better places, such as investing in infrastructure to promote FDI, which may lead to employment, multilateral or bilateral trade, etc. And if the government fails to save money and has a deficit budget, in that case, the government has to go for short-term and long-term loans.

Fiscal policy is the combination of Government revenue through tax or tax cut and Government spending, to influence the country's economy. Uncertainty in Fiscal policy affect Government expenditure, Government revenue and causes instability in Government budget which lessen the growth of the country. Fiscal Uncertainty may bring out the household to postpone consumption and enlarge savings. But the natural question is how this uncertainty emerges and how this uncertainty affects the outcomes. Due to recent financial crises and recession many economists put greater stress on recognizing uncertainty about fiscal and monetary policies as a significant factor which determine outcome of the economy. First, we need to look at what the actual policy rules are and whether the change in these policy rules is temporary or permanent. According to

(Baker, Bloom et al. 2012) to extricate the permanent change from the temporary change in fiscal policy is recognized as basic source of uncertainty in fiscal policy. He used tax code expiration date as an index to measure uncertainty in fiscal policy.

Since financial crises of 2007 to 2009 interest in impacts of uncertainty shocks has been growing and in literature the uncertainty importance for business cycle has been established.

(Bloom 2009) turned his attention towards uncertainty and documented that, shocks of volatility to aggregate productivity generate fluctuation in employment and output and these fluctuations are large enough. Nonetheless, few studies are there that focus on fiscal policy uncertainty, but precisely, impacts of fiscal policy uncertainty on real activities still remain unknown.

In counteract of global recession 2000, many governments have renewed interest rate in fiscal policy analysis by the implementation of fiscal packages but still there is an argument concerning fiscal policy uncertainty on economic growth, although there is a big literature available on the effect of fiscal shocks on economic activities. For example, fiscal shocks have destructive impacts on output of economy, when central bank is forced by zero lower bond then the impacts of these fiscal shocks louden more Fernández-Villaverde, Guerrón-Quintana et al. (2015). Contrasted, (Born and Pfeifer 2014) gives the more opposite results by debating that uncertainty in fiscal shocks is not enough considerable in business cycle contribution. Both of these papers use quantitative New Keynesian Models.

Economic theories more commonly explains that, Uncertainty can in some cases be a key factor in explaining economic fluctuations. For instance, by decreasing its investment and hiring, firm may respond to uncertain surroundings, financial intermediaries may oppose to lend more, propensity to save of households may be increases, as supported in literature (Bloom 2014).

For number of reasons fiscal policy may represent an uncertainty source for economic agents. Economies which are not sustainable in public finance, public expenditure and household spending, may supposed to change in future expenditures or for change in future tax programs but they are not sure about the magnitude of these changes as well as timing of changes in these factors. However, in the economies where there are sustainable public finances, household spending but still fiscal policy uncertainty is high in that economies, this uncertainty in fiscal policy is due to political instability and because of these political contradictions there are weak fiscal framework as well (Perotti and Kontopoulos 2002). In those economies political uncertainty cause changes in fiscal policy because changes in partnership of governments and switches in governments leads to unpredictable and unexpected changes in fiscal policy.

One famous example of fiscal uncertainty is 1st October, 2013 when the federal government of United States shutdown due to the political instability over operational spending. Many other cases such as Tax relief Act of 2010 created uncertainty. This Act include many other taxes and many economic related measures deliberated to activate new effects in economy of United States. Impact of different policies such as lower interest rate also create fiscal uncertainty. When the economy has zero lower bound mean when economy has very low nominal interest rate (which is case in United States most of the time) so then increase in fiscal uncertainty is especially large this reason is because at very low nominal interest rate real interest rate never falls to ameliorate the contractionary effect of unexpected changes in fiscal volatility shocks, as happen when the economy is outside the zero lower bound condition.

Intense Fiscal policy uncertainty may lead to stagflation. Heightened fiscal uncertainty creates inflation while the output of the economy decreases. As mentioned above, Fiscal policy basically is the collection of Government revenue through tax or tax cut and Government spending to

influence the economy of the country. Fiscal volatility shocks mean a greater chance of a big change in tax policy or Government spending policy. On capital income most of the greater uncertainty about the future tax work through the effects of fiscal volatility shocks. So, prediction of marginal cost become harder. In addition, volatility of demand also increases due to increase in fiscal policy uncertainty which may leads for firm to lose more by making mistakes in pricing.

Fiscal volatility shocks and fiscal policy shocks are having first order impacts on economic activities. Taxation and public spending can affect consumption and saving behavior of households, borrowing and investment choices of corporates, and key macroeconomic variables for instance inflation. In economics, studies about fiscal policy encompasses a broad area of literature. Most of the studies focuses on public spending or optimal taxation and their effects on consumption or output multiplier. Likewise, government spending uncertainty or tax rate uncertainty can adjust the process of decision making faced by firms and economic agents. (Bloom 2009) estimates uncertainty shocks in productivity can produce large fluctuations in employment and aggregate output. Lately, (Fernández-Villaverde, Guerrón-Quintana et al. 2015) find that unexpected rise in return on uncertainty of capital tax rate has significant negative effect on output. Uncertainty in fiscal policy also decreases the activities of the Economy such as consumption, output, and investment. Because in the Keynesian model prices are rigid in short run so prices can not entirely accommodate, fall in demand set off when increased uncertainty creates precautionary decrease in demand. In contrast increase uncertainty in fiscal policy cause firm to upraise prices because low cost and reasonable bargain reduces their profit more than that of very high prices. This adjustment of price when combines with uncertainty poke the firms toward the higher prices. This is the mechanism that how consumption, investment and output decrease with increase in fiscal uncertainty.

(Belianska, Eyquem et al. 2018) performed analysis to find out the key factors that alter transmission channel of uncertainty shocks of government spending on investment. Expectedly, the key determinant is substitutability between public bond and capital. On investment the impact of uncertainty shocks is amplified when it is high that portfolio investors have to adjust portfolio very costly since the impact of negative wealth is strong. Interestingly, transmission channels of shocks are strongly affected by the behavior of central bank. Particularly, when monetary policy is slightly active then fall in investment is highly prominent. In latter case when central banks do not react to inflation, uncertainty shocks lead to recession and creates strong deflation which magnifies sovereign debt cost through fisher effect. so, this channel of debt inflation in turn generates reduction in investment and magnifies the rise default of portfolio investor.

Fiscal policy in developing countries differs sharply from that of industrial countries in following key respects: public revenue-GDP ratios are much smaller and significantly more volatile, countries with more variable revenue ratios support lower average debt ratios, the cyclical variability of government expenditures exceeds that of private expenditures by large margins, and fiscal policy follows a cyclical or procyclical patterns, with GDP correlations of the primary balance (government expenditures) close to zero or slightly negative (positive). (Bevan 2010) explain that there is a large empirical literature that finds fiscal policy in developing countries to be highly procyclical, in contrast to high-income countries where it is usually found to be countercyclical. It seems that it is very difficult to design and implement policies that are countercyclical in these countries, and all too easy to do the converse.

In beginning we already noted the contribution of (Fernández-Villaverde, Guerrón-Quintana et al. 2015)and (Born and Pfeifer 2014)in the analysis of uncertainty in fiscal policy, their study reaches on contrary results (Fernández-Villaverde, Guerrón-Quintana et al. 2015) claims that effect of

fiscal policy uncertainty is not negligible while according to (Born and Pfeifer 2014) it does. So, we will contribute in above literature in the way that we are trying to check the impact of government expenditure policy uncertainty on macroeconomic variables. we will explore that whether the impact of fiscal uncertainty is negligible or not and we will also investigate that how private investment and other macro variable reacts in response to fiscal policy uncertainty. We are considering Panel data to untangle public spending and volatility shock in government spending by using GARCH (1) process including volatility process in it. After that we will apply panel vector autoregression (PVAR) to estimate volatility shocks of government spending volatility on consumption, investment and on other key macroeconomic variables as well.

1.2 OBJECTIVES OF STUDY

The core objective of my study is to investigate the effect of government spending uncertainty on private investment. I'm using panel data to document the impact of fiscal uncertainty. Panel is divided into 2 groups such as Low middle-income countries, and upper middle-income countries.

- I shall explore that the impact of government spending uncertainty on private investment is negligible or not. I shall document either positive or negative impact on private investment in response to uncertainty shocks in government expenditure.

- Firstly, I shall measure Government spending uncertainty and analyze it for each country in panel. I shall evaluate GARCH (1) model to find out uncertainty in government spending.

- Secondly, I shall estimate the effects of government spending volatility shocks on macroeconomic variables using a panel vector auto regression (PVAR) model.

- Thirdly, I shall document the impact of fiscal variable (government expenditure, tax receipts and government debt) on performance of key macroeconomic variables by using random effect and fixed effect model.

1.3 RESEARCH HYPOTHESIS

The analysis seeks to test empirically the following hypothesis which are based on objectives of study. Hypothesis are stated as:

H_0: Government spending uncertainty will have significantly negative impact on private investment in the sample overall.

H_1: Government spending uncertainty will not have significant negative impact on private investment in the sample overall.

1.4 SIGNIFICANCE OF STUDY

For several decades, most of the theoretical and empirical studies have focused extensively on government spending uncertainty and economic growth in general. However, there are very less studies, on the relationship between government spending uncertainty and the macroeconomic performance specially for different income Countries. Most of the studies incorporated impact of fiscal policy uncertainty on private investment for particular area or economy. While, this study stands to differ and add to the limited studies by incorporating the impact of government spending uncertainty on private investment for upper middle-income countries and lower middle-income countries respectively. Moreover, most of the studies of fiscal policy only incorporated government expenditure shocks on macro variables, and other fiscal variable like Government debt, tax receipts and transfer payment effects are not fully exposed. This study stands to differ and add to the limited studies on government spending uncertainty and macro variables performance, and also consider government debt and tax receipts along with government

expenditure to disclose the full effects of fiscal variables on consumption, investment, inflation, unemployment and GDP in upper middle income and lower middle-income countries.

1.5 ORGANIZATION OF STUDY

The study will be sectioned into 5 chapters, and it is organized as follows. Chapter one presents the introduction of the study followed by chapter two which presents extensive literature. The methodology employed and the data used are described in chapter three and chapter four discusses the empirical results from the data analysis. Finally, chapter five concludes the main findings of the research with policy recommendation and future research direction.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 2 of my study is based on the previous literature to fill gap for my study. This chapter is based on 2 sections. In first section we will review the overall literature across globe and then in stage 2 we review the studies that used DSGE model.

2.2 THEORETICAL REVIEW

The federal government bodies and economists always give importance and concerned with the monetary policy. So, it is also important to focus on the impact of fiscal policy and its uncertainty impacts on the economies. In our research we will concerned about the impact of fiscal policy uncertainty on different economic variables on the basis of previous researches. This study will relate the literature on the impact of fiscal uncertainty on the economic activities. Although there are few studies that shows the impact of uncertainty in policy, but precisely, the impact of fiscal uncertainty on real activities of the economy remains unknown.

Fiscal policy is one of the important policies used by Government of any country. The main agenda of the fiscal policy is to generate revenues to meet the expenditures of the Government such as defense, Infrastructure, and civil services etc. Government collects taxes (direct or indirect) and uses those taxes to carry out the Government Expenditures. If the Government expenditures are more than the government revenues then this is called Expansionary fiscal policy which mean government have budget deficits and if the Government revenues are greater than the expenditures

then that is the situation of contractionary fiscal policy which means budget surplus. In budget surplus public revenues are always more than the public expenditure.

Fiscal Policy is used as a tool by the governments to set the country on right direct and general revenue by adjusting taxes and expenditures. Fiscal policy plays an important role in attracting foreign direct investment in the country. It has the power to increase economic output by saving money from the budget and diverting it on the development of infrastructure or reduce the economic output if the government has more expenditures than income. All the macroeconomic variables should be kept in view while devising fiscal policy because it can either improve or damage the economy of the country. It is the need of the hour to better tax policies and reduce expenses in order to avoid deficit in the budget. Economy can only be stabilized if the tax laws and policies are improved and implemented in transparent way. In addition to this, state should discontinue subsidies and reduce state expenditures to improve fiscal position of the country. Moreover, the local currency is devaluing due to trade deficit and external debts which can be strengthened by achieving self-sufficiency and by attracting foreign investment.

"Uncertainty" is an unformed concept. Uncertainty in minds of policymakers, households and managers is about future possible outcomes. It is a broader concept as well in a way of macro phenomena like growth of GDP, both micro and macro uncertainty appear to fall off in booms and rise in recessions. Uncertainty also includes the path over micro phenomena like firm's growth, and noneconomic incidence for instance, political instability, climate change, War, jumps of oil prices etc. All of these conditions significantly rise uncertainty. (Knight Frank 1921) defined uncertainty in a modern way. He started his definition in contrast with concept of risk and argued that people's incapacity to predict the possibility of events occurring is referred to as uncertainty

for instance, the total number of coins ever made by humans is uncertain. So, a task in which people don't know how to begin even, is uncertainty.

Later on (Bloom 2014) mixed risk with uncertainty, by giving his broad definition of uncertainty, he said although there is no specific measure but a large number of proxies. GDP or stock market volatility is frequently used as an uncertainty measure because when there is a lot of volatility in data, forecasting of that data it is very difficult. Other uncertainty measures include uncertainty mentioned in news, disagreements of forecasters, firm's productivity shocks etc. He further explained that volatility of bond market, GDP growth, exchange rate and stock market all increases in recession steeply. In recession one explanation of rise in stock market is leverage effect. Firms formally take more loans in recession due to which volatility of their stock return increases. (Schwert 1989) calculated that leverage effect explain that in recession more than 10% increase in uncertainty.

(Sakai 2019) explained that (Keynes and Knight 1921) differentiated uncertainty from insurable risk. In contrast, both Knight and Keynes argued that the uncertainty about the future leads to under employment, as the individual are not able to confide their irreversible resources. (Bernanke 1983) investigate the opposite relationship between investment, employment and uncertainty. An example of a negative impact of uncertainty includes decrease in spending by households (Fernández-Villaverde et al., 2015). Furthermore, (Hassett and Metcalf 1999), concerned about the economic effects of uncertainty in fiscal, regulatory and monetary policies.

During recession unemployment increases, so volatility in consumers income also increases. (Meghir and Pistaferri 2004) and (Heathcote, Perri et al. 2010) explained, it is expected that during recession those who are employed even there is volatility in their income as well. This is true

explanation for the lower income labors. Hence, in recession rising volatility of macro, firms, plant and industry outcomes cause higher volatility of employ's wages.

In Regions low-income countries like south America and Africa have to bear higher volatility in their stock market, GDP growth and exchange rates. (Publications 2013) reported that, "Risk and opportunity" focus that how firms and households faces a variety of micro and macro level risks in developing countries. (Bloom 2014)in panel of sixty countries with available financial data and growth he examined that those who have lower wages, they are having 12% higher volatility in stock market, almost 50% higher of growth rate volatility, and 35% of higher volatility of bond market. Hence, on macro level almost one third higher uncertainty is experienced by developing countries.

(Basu and Bundick 2017) used VAR and explored that uncertainty in data results, decrease in hours worked, consumption, investment and output. According to an assumption increase in future uncertainty persuade lower consumption and precautionary saving. Output will remain constant, if labor supply is inelastic, since technology and stock of capital do not change in result of uncertainty shock. Constant total output and decrease in consumption simultaneously suggest that investment must increase. If both leisure and consumption are normal goods and consumers can adjust their labor supply so then rise in uncertainty also persuade "precautionary labor supply" which mean higher uncertainty push households to increase in labor supply for any given level of wage. As stock of capital and level of technology stay constant, and competitive labor demand remain constant too. Hence increase in uncertainty decreases consumption, but increases investment, working hour and output. Simple neoclassical model suggests that there will be no comovement subject to fluctuation in uncertainty. Their study also proposed that Great recession was in result of increasing uncertainty about future. They identify an economic mechanism which

is applicable to a wide range of shocks that alter future expectations without affecting current fundamentals.

"The certainty of what each individual ought to pay is, in taxation, a matter of so great importance, that a very considerable degree of inequality it appears, is not near so great an evil as a very small degree of uncertainty".

Adam Smith, The wealth of Nations

According to Adam smith taxes uncertainty was very harmful, that an inequality in taxation could be justifiable if it was linked with decrease in uncertainty in tax levies. The concept that uncertainty is injurious is reflected by results that slowdown of investment is due to output prices randomness (Pindyck 1990) explains if combine Smith's views on uncertainty with pindyck's results, suggest that investment will be discouraged due to policy uncertainty. (Hassett and Metcalf 1999) in his study try to explored that whether due to increase in policy uncertainty does investment discouraged? In his study he constructed a simple investment model in which he considered uncertainty in tax policy as well as in output prices (demand uncertainty). He started historical statistics in United States on investment tax credit (ITC). Data shows that with respect to investment tax credit there is significant uncertainty. His results reveled that tax policy speed up or delays, investment is dependent on policy uncertainty. When uncertainty of tax policy leads to cost of capital and follow random walk, higher uncertainty cutdown investment. And when poisson process is followed by uncertainty, investment boosted due to increase in uncertainty.

Economist have highlighted that increase in economic uncertainty is the major factor to steady recovery in recession from 2007 to 2009. In previous years policy change like payroll tax cut 2010, contributed to increase in uncertainty. Economists suggest that for economic fluctuations uncertainty about future is an important driver. For instance, (Diamond 2014) explains that "What

is crucial in current period isn't the labor market's functioning, but the constraints on labor demand resulting from great attention on the part of both consumers and businesses due to the great uncertainty of what will happen next. (Bachmann and Bayer 2013) also find in their study that changes in uncertainty results fluctuations in macroeconomic variables.

(Baker, Bloom et al. 2016) build an index to measure economic uncertainty. They showed in their study that in beginning in 2008, there was overall increase in uncertainty. This uncertainty seems to driven due to increase in economic policies uncertainty. They created an index to measure economic policy uncertainty based on a large number of indicators including the repetition of policy uncertainty mentioned in newspaper. Their US index pikes around the general presidential election, after the 9/11 event, I and II Gulf War, during the debate of debt ceiling of 2011and the bankruptcy of Lehman brothers and other major fiscal policy battles. They used firm level data and explored that uncertainty in policy increase volatility of stock prices, and cut down employment and investment in the sectors which are policy sensitive for instance, construction of infrastructure, defense and healthcare. Innovations in policy uncertainty decreases output, employment and investment at macro level in US and 12 other important economies under the panel VAR. prolonging their index back to 1900, Economic policy uncertainty increased in 1930s and has been steadily rising since 1960s.

(Burnside, Eichenbaum et al. 2004) By post-World War II, they document the shocks in fiscal policy due to real wages and hour worked in United states and find out, these fiscal shocks were due to changes in military spending and also, they contend that these changes in military spending resulted in continuous rise in Government spending and taxes on labor and capital income,

continuous increase in worked hour and decrease in real wages as well. These shocks also lead to small rise in investment and little movements in Household consumption. They used standard neoclassical model to estimate consequences of shocks in fiscal policy in US.

(Auerbach and Hassett 2002) has discovered that economic policies can have a major impact on the economy, but that they frequently do so in unintended ways. This is most likely due to the political process making it difficult for policymakers to implement changes in a timely manner, as well as the fact that information about the current state of the economy at any given time is often insufficient. According To their research during the business cycle, government fiscal aggregates are frequently modified to offer counter-cyclical stimulus. Nondiscretionary changes, or so-called in-built stabilizers," also vary during the business cycle, in a way that is even more predictable than discretionary measures. Such measures introduce significant bidirectional relationship between policy and uncertainty. As long as, the design of optimal policy is highly dependent on degrees of uncertainty about the economy's short term and long-term status.

(Matthes and Sablik 2014) gives an economic brief on Learning about fiscal policy uncertainty. They explored two major questions in their brief about the role that might play by fiscal policy uncertainty in an economy. The first one was what are the effects of uncertainty economically and whether these economic effects of uncertainty are permanent or temporary. Secondly, they explored that how do households and firms learn about fiscal policy changes. They build a model on 'rational expectation framework' which assumes that household (an agent) and a firm are completely aware of economy's structure. If any event or any change occur in the economy they rationally and instantly incorporate new information into their expectations for their future. For instance, in recession from 2007 to 2009 government formulate numerous changes in fiscal policy to counterbalance negative economic shocks. The rational expectation framework assumes that

agents (household and firm) with approach to complete knowledge of structure of economy would expect to change in policies to improve economic conditions, and for future growth of economy they would instantly adjust their future expectation. Agents would not bother the negative economic shocks.

Some economists claimed that framework of rational expectation is not the realistic way to model how households and firm respond during the policy change period. It is not confirmed that agents have complete knowledge of economic policies or not especially when there are sudden changes in policies. So, those economists proposed a new model framework known as 'adaptive learning'. In adaptive learning framework it is assumes that house hold and firms are unaware and uncertain about the future and current structure of entire economy. Models under framework of adaptive learning predicts different results of policy change as compare to framework of rational expectation. Economic effects predicted under the adaptive learning from policies ultimately may be higher than the impact forecasted under framework of rational expectation, and maybe it takes long to adjust new equilibrium.

(Hollmayr and Matthes 2015) proposed a model to find out how uncertainty and learning affects economic responses to change in fiscal policy. They assume in their model that household and firm are well aware about the economy's structure but are completely uncertain about the fiscal policies which government sets in response to change in different economic factor and are unknow about the rule which government follows while setting fiscal policy.

So, (Hollmayr and Matthes 2015) proposed a model to estimate fiscal policy uncertainty. Model is named as RBC type model which is based on adaptive learning framework with government debt and distortionary taxation. In their model agents act as econometricians who all will upgrade their believes in every period about fiscal policy. All of these econometricians did previous

realizations of fiscal variables to find that whether changes in fiscal variables are permanent (derived from changes in fiscal policy parameters) or temporary (derived from exogenous shocks). Their results reveal that by assuming agent were not aware of fiscal policy rule which leads to more differences in outcomes and considerably more volatility in short run.

(Afonso and Sousa 2012) used Bayesian structural vector autoregression approach and estimate Macroeconomic impacts of fiscal policy. They estimate fiscal policy shocks and check its impact on output and asset market, government's debt feedback also included in it. They used quarterly data and empirically investigate evidence from UK, US, Italy and Germany. They find out that public spending shocks have a small impact on GDP, have diverse effect on housing prices and create fall in stock prices. Public revenue shock creates a mixed impact on housing prices and positive small impact on stock prices.

(Bloom 2009) also explores that due to different major events in past like 9/11 attack, OPEC oil prices shock, Cuban missile attack, uncertainty appears. The main objective of this study was to analysis the impact of these major events shocks. He used firm level data and estimated the shocks of macro uncertainty. He extended firm level model with second moment time varying and mixed cost of adjustment for labor and capital. According to bloom higher uncertainty leads to cut down the hiring and investment of the firm temporarily because due to nonconvex cost of adjustment model creates central region of inaction for both investment and hiring space. Whenever business conditions are good enough only then firm used to hire and invest, and firm disinvest and fire only in the case when firm are sufficiently in a bad condition. So, in the response of higher uncertainty firms take more cautions regarding busine conditions.

He used above model to find out the impact of temporary uncertainty shocks on employment, productivity and output. His results say due to large temporary uncertainty shocks, there is a rapid

drop in the above variables, after the uncertainty shocks hiring and investment falls. When investment and hiring decreases, across unit's reallocation also stops due to which growth in productivity decreases. So, uncertainty shocks create fast recoveries and recessions. Besides that, the secondary contribution of this research is to find out the adjustment costs of capital and labor by using vector auto regression (VAR). (Bloom 2009) give attention to uncertainty by showing fluctuations in employment and output due to volatility shocks but still the role of fiscal policy uncertainty on economic growth remains unknown.

(Gilchrist, Sim et al. 2013) analysis the macro and micro level evidences and explores that uncertainty have a great impact of investment. They find that regardless of level of uncertainty, uncertainty's impact on investment occurs due to fluctuation in credit spread. They used quantitative general equilibrium model showing firms, that faces capital adjustment cost, financial friction and time varying uncertainty. In their model they replicate financial shocks as well as uncertainty regarding macroeconomic implications. So, they show both of these uncertainties create procyclical and countercyclical credit spreads and exercise a great impact on investment. They take uncertainty in to account and showed its effect on investment but they also not talk about the role of fiscal uncertainty.

(Alfaro, Bloom et al. 2018) showed that how the impact of uncertainty shocks is amplified by the real and financial friction. They proposed a heterogenous firms' dynamic model and model have two extensions. First extension is, real and financial friction: on the finance side equity have fixed cost and on real side investment have fixed cost, second is, financing cost and uncertainty, and both of them are stochastic with temporary shocks. Their key results were by adding financial friction to the stochastic volatility model of uncertainty shocks the effect of uncertainty shock will roughly double on hiring and investment means hiring and investment will reduce by double. The

other results were financial shocks and uncertainty shocks have additive effect on output. Both of them decreases output, individually uncertainty shocks decrease output by 2.3% and financial shocks by 2.1% but jointly decreases output by 3.5%.

(Anzuini, Rossi et al. 2020) proposed new measure to find fiscal policy uncertainty. They investigate the effect of fiscal uncertainty on business cycle. They find that uncertainty in fiscal policy arises from fiscal policy decisions. They used time varying volatility shocks and measured fiscal reaction function. They came to know that an unexpected increase in our Fiscal policy uncertainty measure has a negative impact on the economy. One implication of this result is that the same change in the government budget can have different effects depending on whether it is associated with a reduction or an increase in fiscal policy uncertainty. Therefore, the neglect of fiscal policy uncertainty may partly explain why the size (and sign) of fiscal multipliers differs so much across existing empirical studies.

(Kim 2016) uses US time series data and investigates the effect of uncertainty of government expenditure policy on economic activity. He constructs uncertainty of public spending policy indexes based on forecast of SPF disagreement measure provided by the Govt of Philadelphia and the public spending uncertainty measure provided by Baker. There are two main findings. First, an increase in public spending policy uncertainty has negative, prolonged, and sizable effects on GDP, private consumption, private investment. Second, the usual recursive VAR model in literature can suffer from the endogeneity issue. The results with the recursive VAR tend to underestimate the adverse effects of public spending policy uncertainty on the economy. Uncertainty about the future path of government policy tends to increase in recession because government spending is one of the policy tools used to adjust business fluctuations. The indexes tend to rise during recession periods such as the recession in 1981 and that caused by the Financial

Crisis. additionally, Government spending policy uncertainty seems to affect private sectors' activity negatively as discussed in previous literature. The previous studies suggest that wait-and-see option channel and precautionary saving mainly reduce private investment and private consumption. An increase in uncertainty increases price levels except in the short-run, which implies that it generates future inflation.

(Davig and Foerster 2019) examine the impact of uncertainty of fiscal cliffs, in Japan in 1990 and 2010, or those in 2012 in united states. Their model highlighted that how future policy news mentioned as an uncertainty shock of fiscal cliff. It is also check that in decision of uncertainty how an economy respond and the probability of embracing new tax policy important for beginning adjustments. Although the Japan and US considered an increase in consumption tax and income. In this paper they developed a general framework in which they can consider multiple issues of fiscal policy for instance, changes in public spending, tax cut and level of debt management. Their results shows that long term uncertainty can affect an economy, even when low fiscal policy is there, by decrease in capital stock and output. Fiscal cliff possibilities can cutdown economic activities even in certainty period.

2.3 PREVIOUS STUDIES THAT USED DSGE MODEL AND PANEL VAR

Uncertainty regarding future policy is frequently blamed for macroeconomic evolutions, although the mechanism is generally left undefined. (Rankin 1998) analyzed and identified the mechanism and constructed dynamic stochastic general equilibrium (DSGE) model. Rankin's explored that current aggregate demand, and thus output level and current price, are likely to be depressed by future fiscal policy uncertainty. He showed this depression in aggregate demand through 3 different ways. Current output will decrease if there is fixed wage rate. Such uncertainty in fiscal policy is proposed as an explanation of Europe economic recovery in 1995 and 1996.

(Leduc and Liu 2016) presented some theoretical argument and evidences that shocks in uncertainty behave like negative shocks in aggregate demand due to which unemployment increases and inflation decreases. They used survey data from UK and USA to measure uncertainty. They used vector autoregression model (VAR) to estimate macroeconomic impacts of uncertainty shocks and showed that due to uncertainty shocks there will about 1% rise in rate of unemployment in Great Recession. They estimate dynamic stochastic general equilibrium (DSGE) model as well and document that in flexible price economy, shocks in uncertainty can be contractionary as compare to real business cycle model. They document that interactivity between nominal rigidity and search friction help to inflate the impacts of uncertainty shocks.

(Born and Pfeifer 2014) used new Keynesian model and study about the fiscal policy risk role by explaining fluctuations in the business cycles as well as technology's uncertainty. From aggregate time series they measure uncertainty and estimate that pure uncertainty effects of the fiscal policy risk in not playing a great role in business cycle volatilities and output effective are comparably less because of the two reasons. Policy risk are too small as well as not magnified. They showed the impact of uncertainty in fiscal policy on business cycle.

(Fernandez-Villaverde, Guerron-Quintana et al. 2011) explains the future fiscal policy uncertainty on the economic activities. Because of the financial crises there were rapid increase in the government debt and fiscal deficits. They have ignored the long-term budgetary issues and through zero lower bond they interpreted their results that there will about 0.15 % points decrease in output due to the uncertainty. Moreover, they find increase in tax and spending risk due to fiscal volatility shocks.

(Fernández-Villaverde, Guerrón-Quintana et al. 2015) firstly explores the tax and spending process for the US with time varying volatility model. Then they find the tax and spending process of US

with new Keynesian DSGE model. Both the models show the negative impact due to unexpected changes in fiscal policies on the tax and spending process of US economy. As i noted in beginning in my study that (Fernández-Villaverde, Guerrón-Quintana et al. 2015) and (Born and Pfeifer 2014) participated to the study of uncertainty of fiscal policy. Both of these comes to the contradiction results as for the fiscal policy uncertainty role in creating business cycle fluctuations. (Bretscher, Hsu et al. 2017) documented New Keynesian model to study the impact of fiscal volatility shocks on bond risk premia and interest rate. Firstly, the showed that government expenditures create positive correlation between inflation and consumption. Secondly, they documented that changes in real term premium leads to fluctuations in nominal term premium while risk premium of inflation is constant over time. After that they analysis the impact of government expenditures volatility shocks is magnified at zero lower bond. Tamoni creates the model where variations in term premia is caused by the fiscal uncertainty. But they do not focus on the impact of fiscal uncertainty on private investment, and GDP.

(Johannsen 2014) used new Keynesian model with accumulation of endogenous capital. He showed that fiscal policy uncertainty brings a big decrease in investment, output and consumption with the tie up of zero lower bond (ZLB), but it has little consequences when monetary authorities are not bound by zero lower bond (ZLB). He studied uncertainty about taxes and uncertainty about public spending on investment, capital income, consumption and wages. In his model public spending uncertainty and uncertainty of wage tax rate has significant impacts. His study reveals that when nominal interest rate is on peak of zero lower bond then impact of fiscal policy uncertainty is very high, and fiscal uncertainty effect only diminishes when uncertainty occur after zero lower bond no prolonger binds.

(Belianska, Eyquem et al. 2018) investigates that if the financial markets are not perfect then government spending uncertainty will have negative impact on private investment. They find that uncertainty in government spending will significantly lower consumption, investment, output and inflation in VAR for the EURO area. This paper basically shows the impact of fiscal policy uncertainty on investment.

Then they build a new Keynesian model extend with imperfect substitutability between the sovereign bond and capital. This study is more related to my research. Belianska, poilly (2018) documented the role of fiscal uncertainty on Private investment, also they take into account the role of financial friction due to fiscal uncertainty and they incorporate the spread of corporate and sovereign bond.

Government spending is one of the policy tools used to adjust economic fluctuations, uncertainty about the future path of government policy tends to rise during a recession. Except in the short run, an increase in uncertainty raises price levels, implying that it causes future inflation. An increase in spending policy uncertainty induces future inflation, which is consistent to Born and Pfeifer (2014) and Fernandez-Villaverde et al.'s (2015) baseline DSGE. Private investment falls in response of Government spending uncertainty. Portfolio investors have encouragement to substitute government bonds towards physical capital, due to which in portfolio the share of capital increases which should drive up investment. But, as portfolio adjustment cost is faced by portfolio investors It is expensive for them to change the portfolio composition, showing that the substitution effect is insufficient. Due to the imperfect substitutability of corporate and Pubic bonds, portfolio managers hold more corporate bonds on one side, while sovereign bonds are not much attractive in times of fiscal uncertainty. Portfolio investors, on the other hand, are more likely to default,

limiting the holdings of private capital credit and, as a result, private investment falls, which in turn lead to a strong recession.

2.3.1   For what Panel VAR have been used?

Panel Vector autoregression (PVAR) is used to address different issues of interest to policy makers and macroeconomists. In business cycle domain (Canova and Ciccarelli 2013) has employed PVAR to estimate similarities differences among G7 cycles. They employed panel VAR to investigate cross-sectional dynamic of business cycle. (Canova and Ciccarelli 2013) estimate heterogeneity in financial linkages across high income economies and compare transference of financial and real shocks with emphasis on recent recession. Panel Var also used to investigate the extent of convergence club and heterogeneity to group units endogenously or characterize differences between them (Canova and Ciccarelli 2004). (De Graeve and Karas 2014) used Panel Var and estimate that interest rate and deposits of "bad" or "good" banks is different is response to shocks in bank run. They showed that important matter is whether banks are insured or not by regulatory bodies rather than difference in their balance sheets.

2.4 RESEARCH GAP

There seem to exist limited studies that shows the relationship between government spending uncertainty and the macroeconomic performance especially for panel data. Our contribution in above literature is that we will document the impact of government spending uncertainty on private investment and other macro variables for different income countries. Firstly, we will estimate government spending volatility shocks by using GARCH (1) process, and investigate the impact of Government spending uncertainty shocks on private investment, consumption, inflation, unemployment and GDP by using panel Vector autoregression (PVAR). Besides, we will also investigate the impact of fiscal variables, including government expenditure, tax revenue and

government debt on performance of macroeconomic variables for Upper middle income and lower

middle-income countries.

CHAPTER 3

DATA AND METHODOLOGY

3.1 INTRODUCTION

Chapter 3 of my study is based on 2 sections, data and methodology. In data section I shall briefly discuss all the variables that I have taken in research. After that I shall explain methodology, As discussed in objectives, my methodology analysis consists of two steps. In step 1 I shall check the impacts of fiscal variables on macroeconomic performance. Step 2 is divided in to two stages. At first stage I shall estimate uncertainty in fiscal policy and after that in 2nd stage, I shall document the empirical effects of fiscal volatility shocks on investment and consumption and on other macroeconomic variables as well which are discussed in data section below.

3.2 DATA AND VARIABLES

I am considering panel data for 122 countries according to their income level. I divided countries into 2 groups, upper middle-income countries and low-middle income countries respectively. High income countries and upper middle-income countries are merged in one group and group is named as upper middle-income countries. Upper middle-income countries included 77 countries named as Albania, Armenia, Australia, Austria, Azerbaijan, Bahamas The, Bahrain, Barbados, Belarus, Belgium, Brazil, Brunei Darussalam, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Estonia, Fiji, Finland, France, Georgia, Germany, Greece, Guatemala, Hongkong, Hungary, Iceland, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Korea Rep, Latvia, Lebanon, Lithuania, Luxembourg, Macao SAR, Malaysia, Malta, Mauritius, Mexico, Moldova, Namibia, Netherlands, New Zealand, North Macedonia, Norway, Oman, Panama, Paraguay, Peru, Poland, Portugal, Romania, Russian

Federation, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom and United States respectively. We dropped rest of the countries due to unavailability of data of relevant variables.

Likewise, low-income countries and middle-income countries are merged in a group and group is named as low middle-income countries. Low Middle income countries included 45 countries such as Angola , Bangladesh, Benin, Bhutan, Bolivia, Burkina Faso, Cambodia, Cameroon, Chad, Comoros, Congo Rep, El Salvador, Eswatini, Gambia The, Ghana, Guinea-Bissau, Haiti, Honduras, India, Indonesia, Iran Islamic Republic, Kenya, Kyrgyz Republic, Lao PDR, Madagascar, Mali, Mauritania, Morocco, Mozambique, Nepal, Nicaragua, Niger, Pakistan, Philippines, Rwanda, Senegal, Sierra Leone, Sri Lanka, Sudan, Tajikistan, Tanzania, Tunisia, Uganda, Ukraine and Vietnam. Others are dropped because of non-availability of data.

The sample Period is annual and ranges from 2000FY to 2019FY using Panel Annual data. Macroeconomic variables include, GDP per capita, private investment, final consumption expenditure, inflation consumer price and unemployment rate.

Final consumption

It is the sum of total household consumption (private consumption) and general total government consumption (public consumption). Final consumption expenditure is expressed as percent of GDP and obtained from "World development index" (WDI).

Private Investment

Private investment includes total outlays by private sector. Private investment is in percent of GDP and obtained from WDI.

GDP per capita

GDP per capita is expressed in annual percentage. It is gross domestic product divided by population. It is also taken from world development index.

Inflation consumer price

inflation consumer price is expressed in Annual Percentage. It reflects annual percent change in cost of basket of goods and services which is acquired by average consumer. It may be changed or fixed yearly.

Unemployment rate

Unemployment rate is in the form of percentage of total labor force and data is come from World Development index. Unemployment rate is referred as a labor force share that is not working but available to work and seeking for employment.

Fiscal variable includes Government expenditure, total tax receipts and government debt. First one is come from WDI and rest of the two variables comes from International Financial statistics (IFS). Fiscal Variables are in the form of percentage of GDP as well.

Government consumption expenditure

It includes all level of government current spending for good and services' purchases, it also includes spending on security and national defense and excludes government military spending, government military spending are included in government capital formation.

Tax receipts

Tax receipts is another fiscal variable which includes all the level of government current tax receipts, which refers to obligatory transfers to the federal government for public determinations. Transfers like penalties, social security contributions and fines are excluded.

Government debt

Public debt included all liabilities that involve payment or payments of interest, debt liabilities are in form of debt securities, SDRs, loans, currency and deposits, pensions, insurance, and other account payables. Hence, all liabilities are debt, except for financial derivatives, investment and equity fund and employee stock options.

3.3 METHODOLOGY

My methodology section is a parted into 2 steps. In first step I will check the impacts of fiscal variables on key macroeconomic performance by using fixed effect and random effect model. I will check that how fiscal variables effects the performance of macroeconomic variables Three fiscal variables are defined in my study such as Government expenditure, tax receipts and Government debt respectively. I will document the effects of fiscal variables on macroeconomic performance by using Fixed effect and random effect model. Firstly, I will investigate the impacts of fiscal variables on upper middle-income countries, then on low middle-income countries and then on overall sample.

Step 2 is my main objective; in this step I will estimate uncertainty shocks in government spending and then I will document its impacts on private investment and on other macroeconomic variables. Step 2 is splits in to two stages, in stage 1 I am using GARCH (1) process to estimate volatility shocks in public spending. I am calibrating this model on each country of panel data to find government expenditure uncertainty shocks. After that in stage 2 I will estimate the effects of fiscal volatility shocks on macroeconomic variables using a panel vector auto regression (PVAR) model.

3.3.1 STEP #1

I. MACROECONOMIC EFFECTS OF FISCAL VARIABLES

Step1 of this section is about the macroeconomic effects of fiscal variables, that how macroeconomic performance is being affected by fiscal variables. Basically, in step 1 we are trying to find out the fiscal variable reaction function on macroeconomic performance. We will use fixed effect model and random effect model to document the impact of fiscal variable on macroeconomic performance.

According to Blanchard and Perotti (2002), government expenditure has a long-term effect on private consumption, which is consistent with Keynesian models but not with the neoclassical approach. Furthermore, there is new literature on the theory of 'expansionary fiscal contraction,' according to which a reduction in the provision of those public goods that are in the utility function of households, due to reductions in government expenditures that may leads to increased spending by households to close the gap, and thus components of aggregate demand rise. The fiscal reaction functions are mainly useful in estimating how governments react to public debt changes. The fiscal reaction functions are most useful for predicting how governments react to changes in public debt. Government fiscal policy is administered sustainably, according to empirical study, by either raising or decreasing the primary surplus or deficit in response to mounting debt. The response of the primary balance expenditure or revenue to changes in lagged debt is often reflected in the fiscal reaction function. So here, we estimated the reaction of the fiscal variables on macro variables. The determination of fiscal variables is the reaction of macroeconomics variables. An Increase or decrease in the fiscal variables are the policy reaction of macroeconomic variables. We are trying to find out, after the reaction of macro variables, when fiscal variables change (determined) then again what are the impacts of these fiscal variables on macroeconomic performance.

METHOD

A. FIXED EFFECT MODEL

Fixed effect model assumes that differences among cross sections can accommodate from differences among their intercepts. This model assumption is that for each cross section it produces constant intercept and time examine less realistic. Here this model allows for heterogeneity or individuality between 122 countries (over all sample), then between 77 countries (upper middle-income countries) and at last among 45 countries (lower middle-income countries) by allowing to have its own intercept value. Fixed effect is due to fact that although intercept may differ across countries, but intercept does not vary over time, which means it is time invariant.

FIXED EFFECT REGREESION EQUATION FOR PANEL DATA IS:

$$y_{it} = \alpha_0 + \beta X_{it} + \varepsilon_{it}$$

i is number of cross section countries where t is time period for cross section.

B. RANDOM EFFECT MODEL

In random effect model intercept differences for each country is accommodated by error terms. Random effect model eliminates heteroscedasticity.

In this model all countries have common mean value for intercept.

RANDOM EFFECT REGREESION EQUATION FOR PANEL DATA IS:

$$y_{it} = \alpha_0 + \beta X_{it} + v_i + \varepsilon_{it}$$

II. REGRESSION MODEL FOR MACROECONOMIC VARIABLES

REGRESSION EQUATION FOR GDP

$$GDP_{it} = \alpha_0 + \alpha_1 Ge_{it} + \alpha_2 GD_{it} + \alpha_3 TR_{it} + \varepsilon_{it}$$

Where, GE, GD and TR are fiscal variables.

REGRESSION EQUATION FOR CONSUMPTION

$$CONS_{it} = \beta_0 + \beta_1 Ge_{it} + \beta_2 GD_{it} + \beta_3 TR_{it} + \varepsilon_{it}$$

REGRESSION EQUATION FOR INVESTMENT

$$INV_{it} = \gamma_0 + \gamma_1 Ge_{it} + \gamma_2 GD_{it} + \gamma_3 TR_{it} + \varepsilon_{it}$$

REGRESSION EQUATION FOR INFLATION

$$INF_{it} = \lambda_0 + \lambda_1 Ge_{it} + \lambda_2 GD_{it} + \lambda_3 TR_{it} + \varepsilon_{it}$$

REGRESSION EQUATION FOR UNEMPLOYMENT

$$UN_{it} = \eta_0 + \eta_1 Ge_{it} + \eta_2 GD_{it} + \eta_3 TR_{it} + \varepsilon_{it}$$

We will document the impact of fiscal variable of each macroeconomic variable one by one.

3.3.2   : STEP # 2

GOVERNMENT SPENDING UNCERTAINTY SHOCKS

In this section, we investigate stochastic volatility process on government spending to evaluate volatility shocks in government expenditure. Then we estimate the impacts of fiscal volatility shocks on macroeconomic variables by using PVAR model.

I. STAGE 1: ESTIMATION OF VOLATILITY SHOCKS

As there are different methods to find the uncertainty in fiscal policy but in current study, we will use following method.

METHOD

 (Born and Pfeifer 2014) (Fernandez-Villaverde, Guerron-Quintana et al. 2011) and (Belianska, Eyquem et al. 2018) evaluate public expenditure uncertainty shocks by resorting to stochastic volatility model. We will suppose that public spending shocks use GARCH (1) process, so

$$\hat{g}_t = \rho_g \widehat{ge}_{t-1} + \sigma_t^g \varepsilon_t^g,$$

$$\sigma_t^g = (1 - \rho\sigma^g)\,\sigma^g + \rho\sigma^g \sigma_{t-1}^g + \eta\sigma^g \varepsilon_t^{\sigma^g},$$

Where $\boldsymbol{\varepsilon}_t^g \sim \mathbf{N}\,(0,\,1)$ and $\boldsymbol{\varepsilon}_t^{\sigma^g} \sim \mathbf{N}\,(0,\,1)$ are iid (independent and identically distributed random variables) shocks

$\boldsymbol{\sigma}_t^g$ is used to estimate fiscal policy uncertainty.

$\boldsymbol{\rho}_g$ used to find the level of public spending shocks

$\boldsymbol{\rho\sigma^g}$ finds the volatility of public spending shocks.

$\boldsymbol{\eta\sigma^g}$ estimates the magnitude of the uncertainty shocks of the public spending.

$\widehat{\boldsymbol{ge}}_t$ is the series of public expenditure

For public spending we are using GARCH (1) process with time varying volatility. This process will be investigated panel data for overall sample (122 counties we have taken for panel), upper middle-income countries and low- middle income countries from 2000FY to 2019FY.

Public spending shocks used GARCH (1) process so various four models AR, MA, ARMA and GARCH are briefly described here.

a. Autoregressive (AR) process

AR model for order "p" is the current values of variable and their lagged value plus a random error term. Equation is written as:

$$g_t = \delta + \sum_{j=1}^{P} \theta_j\, g_{t-j} + \varepsilon_t$$

Where $\boldsymbol{\varepsilon}_t \sim \mathbf{N}\,(0,\,\sigma^2)$, $\boldsymbol{\delta}$ is intercept. $\boldsymbol{\theta}_j$ is unknown parameter of AR process and $\boldsymbol{\varepsilon}_t$ is an error term which is uncorrelated.

Autoregressive model considers that at time t is a linear combination of p previous realization and noise term.

For $p = 0$, $g_t = \varepsilon_t$ and there is no autoregression.

Lag operation is denoted by "L", it is used to express lagged value so,

$$L\, g_t = g_{t-1},\, L^2 g_t = g_{t-2},\, L^3 g_t = g_{t-3} \ldots\ldots\ldots\ldots\ldots L^x g_t = g_{t-x}$$

If we define

$$\theta(L) = 1 - \sum_{j=1}^{P} \theta_j\, L^j = 1 - \theta_1 L - \theta_2 L^2 - \cdots - \theta_p L^p$$

Equation gives AR process

$$\theta(L)g_t = \varepsilon_t \; ; t = 1, \ldots, n$$

$\theta(L)$ denoted as characteristics polynomial of AR process and its roots tells when AR process is stationary or nonstationary.

b. Moving Average (MA) Process

In Moving average process order "q" is the current values of variables used in study and error term with its lagged values plus random distribution term. Equation is written as

$$g_t = \delta + \sum_{i=1}^{q} \theta_i e_{i-1} + \varepsilon_t$$

Here δ is the intercept, θ_i are the unknown parameters of MA process and ε_t is an uncorrelated error term.

Moving Average (q) defines correlation of noise structure and errors are iid.

In Lag operation the MA (q) process is,

$$g_t = \theta\,(L)\delta_t \text{ where } \theta\,(L) = 1 + \sum_{i=1}^{q} \theta_i\, L^i.$$

c. Autoregressive moving average process (ARMA)

The auto regressive moving average process (ARMA) is order of p and q and written as ARMA (p, q) when combines both AR and MA models and its equation written as

$$g_t = \delta + \sum_{j=1}^{p} \theta_j \, g_{t-j} + \sum_{i=1}^{q} \theta_i \, e_{i-1} + \varepsilon_t$$

Here $\boldsymbol{\delta}$ is the intercept, $\boldsymbol{\theta_j}$ are unknown parameters of AR process, $\boldsymbol{\theta_i}$ are unknown parameters of

MA process and $\boldsymbol{\varepsilon_t}$ is a random error term which is uncorrelated.

In Lag operation ARMA (*p, q*) process is,

$$\theta \, (L) \, g_t = \theta \, (L) \, \varepsilon_t, t = 1, \ldots, n$$

d. Generalized Autoregressive conditional Heteroscedasticity (GARCH) process

GARCH model is the extension of ARCH model. GARCH (*p, q*) model takes the components of

both AR and MA in form of Heteroscedasticity. GARCH (*1, 1*) equation written as

$$h_t = \alpha_0 + \alpha_1 \varepsilon_{t-i}^2 + \beta_1 h_{t-1}$$

GARCH (*1, 1*) is stationary if $\alpha_1 + \beta_1 < 1 \; where \; \alpha_1 \; and \; \beta_1$ is nonnegative.

Model describes uncertainty of government expenditure at time t by using GRCH process as we

discussed in beginning of this chapter.

$$g_t = \mu + \rho \sigma_t^g \varepsilon_t$$

$\boldsymbol{\rho \sigma_t^g}$ is stochastic process which is nonnegative.

$\boldsymbol{\varepsilon_t}$ is i.i.d sequence.

Volatility of government spending is denoted by $\rho \sigma_t^g$. g_t and $\rho \sigma_t^g$ (volatility) are stationary and

μ must be zero.

GARCH (*p, q*) model is,

$$g_t = \mu + \rho \sigma_t^g \varepsilon_t$$

$$\rho \sigma_t^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \, g_{t-i}^2 + \sum_{j=1}^{p} \beta_j \, \rho \sigma_{t-j}^2$$

Here *p, q* are orders of GARCH which are the number of lags in actual.

Parameters are α_0, α_i and β_j respectively. They are assumed as nonnegative and are weight of

lagged terms.

In GARCH approach parameters are estimated by (MLE) Maximum likelihood estimation

method

Volatility of Government expenditure can be estimated by using GARCH (*1, 1*)

Equation is:

$$g_t = \mu + \rho\sigma_t^g \varepsilon_t$$

$$\rho\sigma_t^2 = \alpha_0 + \alpha_1 g_{t-1}^2 + \beta_1 \rho\sigma_{t-1}^2$$

g_{t-1}^2 and σ_{t-1}^2 are residual square.

Volatility of Government spending is derived as:

$$\rho\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \rho\sigma_{t-1}^2$$

$\alpha_0 = \varphi V$ where φ is weight of variance V.

$\varphi + \alpha_1 + \beta_1 = 1$ $implies$ $that,$ $\varphi = 1 - \alpha_1 - \beta_1$

So,

$V = \frac{\alpha_0}{1-\alpha_1-\beta_1}$ it means as number of lags increases the forecast variance converge into variance

unconditional.

II.   STAGE 2: EMPERICAL EFFECTS OF FISCAL VOLATILITY SHOCKS

In stage 2 I will investigate the above estimating variables in panel vector autoregression (PVAR)

with monte Carlo simulation. We included macroeconomic variables like, investment,

consumption, CPI inflation, GDP per capita and unemployment.

$$X_t = [gdp_t \ cons_t \ inv_t \ un_t \ inf_t^{cpi} \ \varepsilon_t^{\sigma^g} \ ]$$

Here variable GDP is at annual percentage

$cons_t$ is expenditure of final consumption taken as percentage of GDP

inv_t is investment taken as percentage of GDP

inf_t^{cpi} is inflation consumer price at annual percentage

un_t is unemployment at percentage of total labor force

Models of VAR are very well established in field of macroeconomics. In this model all the parameters are treated as interdependent and endogenous, though some exogenous parameters could include as well. Let X_t is a $G \times 1$ vector of endogenous variable.

The VAR for X_t is

$$X_t = A_0(t) + A(l)X_{t-1} + \varepsilon_t, \ \varepsilon_t \sim iid(0, \epsilon_\varepsilon)$$

Panel VAR has exactly same structure like VAR model, in sense that all the parameters are treated as interdependent and exogenous, but in representation cross sectional dimension is included in it. Hence, assume X_t is staked version of x_{it}, then vector of G for every unit $i = 1, \dots, n$ so, $X_t = (x_{1t}, x_{2t}, \dots, x_{Nt})$. The "$i$" indicates sectors, markets, countries or combination of them. Panel VAR is

$$x_{it} = A_{0i}(t) + A_i(l)X_{t-1} + \varepsilon_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T$$

ε_{it} is $G \times 1$ random distribution vector.

CHAPTER 4

ESTIMATION AND INTERPRETAION

4.1 INTRODUCTION

This chapter presents descriptive statistics on variables that I have taken in analysis for regression. Empirical results of stochastic volatility model and Panel VAR are included. Estimation of random and fixed effect and impulse response of government spending uncertainty are being discussed and interpreted here in this chapter.

4.2 DESCRIPTIVE STATISTICS

This chapter starts with the analysis of descriptive statistics of all the variables to inspect the characteristics of variables which are used for our analysis.

Table 1 is presenting summary statistics of variables that we are using in our analysis. Statistics are for the overall 122 countries in sample. The sample of overall 122 countries include 77 upper middle-income countries and 45 lower middle-income countries respectively. These group of countries are selected on the bases of data availability, especially for independent variables and dependent variables of interest. Government expenditure as a percentage of GDP averaged 12.72% over the period and standard deviation of 4.43 in low middle-income countries. In upper middle-income countries Government expenditure averaged 16.87% over period with 4.50 of standard deviation. Over the period mean of upper middle-income countries is higher than low middle income. Government expenditure of overall sample, over the period averaged 15.34% with standard deviation of 4.90. As overall sample contain both upper middle and lower middle countries so its mean value is less than upper middle-income countries but more than low middle-income countries over the period.

Table No. 4.1
Descriptive Statistics Low Middle Income Countries

	GDPpc	CONS	UN	GE	INF	INV	TR	GD	UC
Mean	2.71	85.26	6.12	12.72	7.36	23.28	13.78	54.11	0.02
St. Error	0.12	0.46	0.17	0.15	0.47	0.31	0.23	1.12	0.04
Median	2.96	86.25	4.35	12.62	5.22	21.91	11.89	46.55	0.00
St. Dev	3.65	13.83	5.11	4.43	14.24	9.37	6.98	33.49	1.26
Kurtosis	8.13	1.27	3.30	-0.54	291.78	6.14	1.73	6.68	4.99
Skewness	-0.25	-0.45	1.66	0.22	14.50	1.73	1.35	2.12	0.19
Range	50.99	105.74	28.11	23.01	343.11	79.95	40.31	225.35	13.2
Minimum	-22.31	35.07	0.13	3.46	-18.11	1.10	3.67	8.37	-7.10
Maximum	28.68	140.81	28.24	26.47	325.00	81.05	43.98	233.72	6.16
Sum	2437	76731.9	5510.15	11449.08	6622.37	20952.3	12403.39	48699.66	15.66
Count	900	900	900	900	900	900	900	900	900
Descriptive Statistics Over All Sample									
Mean	2.56	79.16	7.38	15.34	5.17	23.09	21.82	52.56	0.02
St. Error	0.08	0.29	0.11	0.10	0.21	0.14	0.23	0.73	0.02
Median	2.40	79.08	6.00	15.44	3.29	22.22	19.66	44.12	0.00
St. Dev	3.78	14.19	5.49	4.90	10.47	7.08	11.43	36.17	1.05
Kurtosis	7.81	0.94	4.50	-0.59	407.87	8.84	-0.93	4.64	6.77
Skewness	0.42	-0.30	1.83	0.06	16.09	1.87	0.37	1.74	0.37
Range	56.04	114.77	37.12	26.53	343.11	79.95	48.66	237.69	13.88
Minimum	-23.04	26.04	0.13	3.46	-18.11	1.10	0.83	0.00	-7.10
Maximum	33.00	140.81	37.25	29.99	325.00	81.05	49.49	237.69	6.78
Sum	6258.4	193147.53	18017.22	37432.60	12621.02	56334.13	53205.05	128241.29	57.42
Count	2440.00	2440.00	2440.00	2440.00	2440.00	2440.00	2438.00	2440.00	2440.0
Descriptive Statistics Upper Middle-Income Countries									
Mean	2.48	75.59	8.12	16.87	3.90	22.98	26.52	51.65	0.03
St. Error	0.10	0.34	0.14	0.11	0.18	0.14	0.28	0.96	0.02
Median	2.16	76.32	6.63	17.25	2.58	22.31	27.43	42.59	0.00
St. Dev	3.85	13.15	5.58	4.50	7.12	5.31	10.89	37.64	0.91
Kurtosis	7.75	1.24	4.99	-0.67	216.71	4.12	-0.76	3.80	7.57
Skewness	0.76	-0.43	1.97	0.04	11.70	1.36	-0.13	1.59	0.62
Range	56.04	87.85	37.04	23.49	173.10	48.50	48.66	237.69	12.46
Minimum	-23.04	26.04	0.21	6.50	-4.48	9.21	0.83	0.00	-5.69
Maximum	33.00	113.89	37.25	29.99	168.62	57.71	49.49	237.69	6.78
Sum	3820.69	116415.6	12507.0	25983.51	5998.6	35381.7	40813.26	79487.31	41.76
Count	1540	1540	1540	1540	1540	1540	1539	1539	1540

GDP per capita growth annual percent averaged 2.71% with standard deviation of 3.65 for low-income countries while upper middle income averaged 2.48% and its standard deviation is 3.85. Mean average GDP growth is high in low middle income. GDP growth annual percent of overall

countries averaged 2.56% with S.D of 3.78. Private investment percentage of GDP have mean average of 23.09% in overall countries with standard deviation of 7.08. Upper middle income and low middle income averaged 22.98% and 23.23% with standard deviations of 5.31 and 6.98 over the period respectively. Mean average of private investment is higher in low middle-income countries. Uncertainty of government spending also averaged 0.02% in low middle income over period and higher in upper middle income with mean average of 0.03% and standard deviation is 0.91.

Kurtosis and Skewness values are used to evaluate normality distribution of variables. All the variables in overall sample are positively skewed aside consumption. Consumption shows negative skewness. In upper middle-income countries consumption and tax revenue are showing negative skewness value while in low middle-income countries all variables show positive skewness but GDP growth and Consumption are negatively skewed. Consumption showed negative skewness value in each group.

Kurtosis suggest that for the evidence of normality a value should below 3. Value above 3 is the evidence of non-normality. All the variables in low middle income but consumption and Tax revenue is distributed normally. Consumption is also normally distributed in overall countries. Upper middle-income countries have all nonnormally distributed variables other than consumption. Its mean that consumption is negatively skewed normal distribution. Government expenditure have negative kurtosis value in each case. Distribution which has negative kurt0sis value reveals that tail of distribution is lighter than the normal distribution. (Kim 2013) recommends that if the sample size is more than 300 observations then this criterion is unreliable. He suggested that standard kurtosis value above 7 is non normality evidence. If we follow this criterion then all are normally distributed but GDP growth and inflation is nonnormally distribution

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in low middle-income countries. In upper middle income per capita growth, inflation and government expenditure uncertainty are distributed non normally. GDP per capita growth, inflation and investment is non normally distributed in overall countries according to above criterion.

4.3 RESULT AND INTERPRETATION OF MODELS

This section of chapter 4 of my analysis is based on results and its interpretation. I have explained and interpreted all of the results of my above methodology and variables here in this section. I investigated the impact of fiscal variables on macroeconomic performance by using fixed effect and random effect model, and then I estimated public spending volatility shocks by using GARCH (1) process and documented the impact of public spending volatility shocks on macroeconomic variables specifically on private investment. I estimated all these impacts on lower middle income and on upper middle income one by one and then on over all panel countries.

4.3.1 ESTIMATION AND INTERPRETATION OF FISCAL VARIABLES IMPACT ON MACROECONOMIC PERFORMANCE

In this section we will estimate random and fixed effect model to check the impact of fiscal variables on macroeconomic performance.

I. FISCAL VARIABLES IMPACT FOR OVER ALL COUNTIRES

Results of random effect and fixed effect models are shown below in Table 4.2 and all the standard errors are in parentheses. This table will show the impact of fiscal variable on performance of macroeconomic variables.

C	GDP	CONS	UN	INF	INV
GE	-0.264 (0.031)	1.214 (0.051)	0.151 (0.025)	-0.064 (0.111)	-0.113 (0.051)
TR	0.064 (0.015)	-0.279 (0.041)	-0.162 (0.017)	0.295 (.079)	-0.049 (0.032)
GD	-0.018 (.003)	0.027 (0.005)	0.026 (0.002)	0.058 (0.009)	-0.083 (0.006)

Std. Err are in parentheses

INTERPRETATION

The objective of my analysis is to measure the effects of fiscal variables on macroeconomic performance. For this purpose, major fiscal variables are government consumption expenditure, tax revenue and government debt. Hausman specification test will recommend that which model is appropriate for each variable either fixed effect or random effect model. Table 4.2 is interpreted below by column vise.

Table 4.2 shows the regression results of fiscal variables fluctuation on macroeconomic variables for overall panel countries. We used fixed effect and random effect model to see the impact of fiscal variables. We run Hausman test to select which model is appropriate. Null hypothesis of Hausman test is Random effect model is appropriate. If p value is less than 0.05 then we reject the null and if p value is greater than 0.05 than we do not reject the null hypothesis. If p value is less than 0.05 its mean that fixed effect model is appropriate model to investigate the impact of fiscal variables uncertainty on macroeconomic variables. And if p value is more than 5% its mean that we are going to use random effect model.

Table 4.2 reports the fiscal variables estimated coefficients and their standard errors in parentheses. Results show that Government expenditure creates statistically significant decrease in GDP per capita. Government expenditures is formally divided into two categories, Government

consumption expenditure and government investment expenditure. In my study I have taken government consumption expenditure. So, when government consumption expenditure increases, growth of GDP decreases. According to results 1% increase in government expenditure leads to 0.26 % decrease in GDP per capita growth. (Butkiewicz and Yanikkaya 2011) documented that government expenditure estimated negative effects on GDP per capita growth in developed as well as developing countries. Random effect model is used to check the impact of government expenditure fluctuation on GDP per capita growth. P value of Hausman test is 0.129 which is very large and more than 5% so we cannot reject the null hypothesis and used Random effect model.

Tax receipts showed significantly positive impact on growth. 1% increase in tax revenue will increase the GDP growth by 0.06%. Tax revenue actually includes the revenues which are from taxes on goods and services, taxes on income, payroll taxes, taxes on transfer of property and on ownership. So, tax revenue is the part of economy's GDP. As it is the percentage of GDP, it specifies the share of economy's output that is generated through the taxes. So, if there will increase in tax collection, it means tax revenue increases, that will lead to increase in GDP growth. Government debt leads to statistically significant decrease in GDP growth. Results explain that if there will 1% increase in government debt, GDP growth will decrease by 0.018%. as the government debt increases, GDP growth will decrease by 2% approximately.

Second column of Table 4.2 explains the effects of fiscal variables on total consumption. Results shows that if there will 1% increase in the Government expenditure, total consumption will increase by 1.21%. Government expenditure have statistically significant positive impact on total consumption. Basic ISLM model suggested that an increase in government expenditure leads to increase in consumption. Increase in consumption is due to higher disposable income created from government expenditure's direct effect on economic activity, joint with assumed dependency of

consumption on disposable income. Tax receipts significantly decreases consumption. When government's tax revenue increases its mean that more tax is collected by the government so consumptions fall. Results showed that there is 0.28% decrease in consumption as result in 1% increase in tax revenue. Consumption will increase by 0.027% in response to increase in government debt by 1%. According to (Kormendi 1983) consumption remains stable or expected to increase in response to government debt. An increase in government debt is encountered with responses of consumer because it is expected that increasing debt is followed by future taxes. Fixed effect model is used here to find out the impacts of fiscal variables on consumption. P value of Hausman test is 0.00 which is less than 5% so we reject the null and used fixed effect model.

Third column of table 4.2 suggested that unemployment significantly increases in response to increase in government consumption expenditure and govt debt, while it decreases as a result of increase in tax revenue. All the fiscal variables are statistically significant here. Literature revealed that rise in government expenditure leads to increase in unemployment while increases in public investment encourage employment. In other words, government consumption expenditure creates unemployment and government investment expenditure creates employment. According to results unemployment is increased by 0.15% in response to 1% increase in Government expenditure, but unemployment decreases by 0.16% in the result of increased tax receipts. Our results are consistent with OECD report, 2011. In their report they argue that due to increase in taxes, employers' social security influence and payroll taxes for less skilled labour reduces, long term unemployed and older labors will decrease cost of hiring them. So, this will help in increasing demand for labour which lead to decrease in unemployment. We run random effect model to here to documents the effect of fiscal variables on unemployment.

Inflation is statistically insignificant at 5% and have negative relationship with government expenditure. When government expenditure increases, inflation consumer price is decreases by 0.064%. As the coefficient of investment and GDP per capita is negative in response to increase in government expenditure, inflation coefficient is also negative which indicates that government expenditure leads to fall in inflation. This is contrary to findings of (Fernandez-Villaverde, Guerron-Quintana et al. 2011) who investigates that uncertainty in fiscal policy have stagflationary effects by using new Keynesian business cycle model. Alternatively, it come out that government expenditure creates drag on aggregate demand due to which GDP per capita, inflation and investment pushes downward. Inflation has positive relationship with other two macroeconomic variables such as tax revenue and govt debt. If government debt is increases by 1% then inflation will increase by 0.06%. Government debt has significantly positive effect on inflation (Van Bon 2015) also suggest that inflation increases due to increase in level of government debt.

Last column of Table 4.2 showed the negative relation of investment with all the fiscal variables. It means that fiscal uncertainty has negative impact on investment. When fiscal variables fluctuates then investment decreases. All the fiscal variables are statistically significant and negatively related with investment. Investment will decrease by 0.11%, 0.05% and 0.08% in response to 1% increase in Government expenditure, total revenue, and government debt respectively. P value of Hausman test is 0.000 which is less than 5%, so we are rejecting the null hypothesis and using fixed effect model.

II. FISCAL VARIABLES IMPACT ON UPPER MIDDLE INCOME COUNTIRES

Table 4.3 is showing the results of fixed effect and random effect model for upper middle-income countries.

TABLE N0 4.3: UPPER MIDDLE-INCOME COUNTRIES

C	GDP	CONS	UN	INF	INV
GE	-0.557 (0.058)	1.639 (0.061)	0.367 (0.039)	-0.306 (0.085)	-0.137 (0.062)
TR	0.124 (0.040)	-0.167 (0.043)	-0.044 (0.072)	0.090 (0.041)	-0.135 (0.044)
GD	-0.026 (0.006)	0.026 (0.006)	0.539 (0.006)	-0.017 (0.008)	-0.102 (0.006)

Std. Err are in parentheses

Table 4.3 shows the impact of fiscal variables on macroeconomic performance for upper middle-income countries. Government expenditure, government debt and tax revenue are the fiscal variables. we used fixed effect and random effect to estimate their impacts. And then we applied Hausman test to find out which model is good. Column 1 show that Tax revenue and government debt is statistically significant at 5%. Government expenditure and government debt have negative coefficients which means both are negatively related to GDP while coefficient of tax revenue is positive. Government expenditure explains that 1% increase in government spending will decrease GDP per capita growth by 0.56%, furthermore, 1% increase in Tax revenue and government debt will lead to increase GDP per capita growth by 0.12% and decreases growth by 0.03% respectively. GDP growth follows fixed effect model. As p value of Hausman test is 0.003 which is less than 0.05 so we rejected the null and follows fixed effect model. As taxes are the part of GDP so when there will increase in taxes, Total Consumption of upper middle-income countries increases in response to increase in government debt and government expenditure, while tax revenue has significantly negative effect on total consumption. Rise in taxes put less money in the hand of

consumer due to which consumption fall. Results reveals that 1% increase in Tax revenue will decrease total consumption by 0.17%.

Unemployment in middle income countries is following same pattern as in overall countries. Unemployment significantly increases due to increase in government debt and government expenditure while it decreases in response to increase in tax revenue. Table 4.3 shows that unemployment significantly increases by 0.36% due to increase in government consumption expenditure and 0.54% increase due to increase in government debt. Fixed effect model is appropriate model to estimate the impact of fiscal variables on unemployment. Investment is also following fixed effect model while for inflation random effect model is suitable because p value of Hausman test for inflation is 0.863 which is very high so we will go for random effect model.

All the fiscal variables have statistically significant negative effect on investment. Due to any increase in fiscal variables private investment will significantly decreases. Our results are consistent with the literate that, investment falls in the response of fiscal fluctuations. Column 4 of table 4.3 suggest that inflation decreases in response to increase in government consumption expenditure and government debt on the other hand it increases by 0.90% if tax revenue increases. Tax revenue has significant positive impact on inflation. Public debt in table 4.2 showed that in overall countries public debt has significantly positive impact on inflation while in upper middle-income countries it is showing negative effect on inflation. Inflation falls by 0.017% if public debt increases. The relationship between inflation and government debt can either be negative or positive, argued by (Nastansky and Strohe 2015) It is positive when central bank buys government bond while relationship is negative when government bond is demanded by the private sector. It may be negative as well when public bonds are demanded by banking sector. Our results are consistent with (Aimola and Odhiambo 2021) they used ARDL framework and explored that

government debt has direct relationship with inflation in case of Ghana. Inflation will increase in response to positive public debt.

III.   FISCAL VARIABLES IMPACT ON LOW MIDDLE INCOME COUNTIRES

Table 4.4 is showing the results of fixed effect and random effect model for lower middle-income countries.

TABLE N0 4.4: LOWER MIDDLE-INCOME COUNTRIES

C	GDP	CONS	UN	INF	INV
GE	-0.049	0.784	-0.074	-0.076	0.435
	(0.059)	(0.193)	(0.024)	(0.183)	(0.094)
TR	-0.088	-0.373	-0.031	0.507	0.439
	(0.044)	(0.076)	(0.018)	(0.126)	(0.069)
GD	-0.020	0.027	0.011	0.1003	-0.063
	(0.005)	(0.008)	(0.002)	(0.017)	(0.008)

Std. Err are in parentheses

Table 4.4 show that fiscal variables have indirect effect on GDP growth. GDP growth falls in response to increase in government consumption expenditure, tax receipts and public debt. GDP per capita growth is decreases by 0.049% if government expenditure increases. Government expenditure significantly affecting GDP per capita in low middle-income countries. If tax receipts increase by 1% then GDP will significantly decrease by 0.09% and if public debt is increasing then it will also affect GDP per capita negatively and GDP will decrease by 0.02%. Les picker (2008) argued in his article that exogenous increase in taxes lower GDP by 2 to 3%. Changes in taxes which are used to promote growth in long run or to reduce deficit budgeting, in contrast, are assumed for reasons which are essentially not related to other factors that are influencing output. However, investigating the output behavior that are following these changes in taxes is likely to give reliable estimates of output effects which are due to changes in taxes. Therefore, results of this reliable test show that changes in taxes have large effect, exogenous increases in taxes of 1

percent of GDP, decreases GDP by 2 to 3%. Hausman test show that fixed effect is appropriate model to check the impact of fiscal variables on GDP. P value of Hausman test is 0.02% which reveals that Fixed effect model is appropriate model.

Consumption of low middle-income countries is also following same pattern as in overall countries and in upper middle-income countries. Consumption has indirect relationship with taxes on the other hand government spending and public debt have direct and positive impact on consumption. When government expenditures increase by 1% it will lead to 0.78% rise in consumption. Consumption also rises by 0.027% due to 1% increase in public debt. Tax receipts decreases consumption in low middle-income countries as well. When government's tax revenue increases its mean that more tax is collected by the government and less money in the hand of consumer due to which consumption falls. Table show that if government tax receipts increases then final consumption will decline by 0.37%. Random effect model is appropriate model to estimate effects on consumption.

Unemployment falls by 0.074% due to increase in government consumption expenditure. (Brückner and Pappa 2012) documented that increase in government expenditure can increase employment and unemployment simultaneously by persuading increase in the participation of labor force. Our analysis is consistent with these results. Unemployment decreases in the result of increase in tax receipts. Unemployment falls in each group due to increase in tax revenue. Low middle-income countries reveal that 1% increase in tax revenue leads to 0.031% decrease in unemployment. Aside that unemployment in lower middle-income countries rises in response to rise in public debt just as in upper middle income and overall countries. Table 4.4 suggests that if there will increase in public debt by 1%, it will lead to increase in public debt by 0.01%. we investigate the impact of fiscal variables on unemployment by estimating Fixed effect model.

Fixed effect model is also appropriate for investment. Our results reveal that government debt have significant negative effect impact on investment. 1% increase in government debt leads to 0.06% decline in private investment. P value of Hausman test for inflation is 0.22 which is very large. So Hausman test indicates that for inflation Random effect model is appropriate. Results shows that inflation decreases in response to increase in government expenditure, as it also declined in overall countries and upper middle countries. 1% increase in government consumption expenditure will lead to decrease in inflation by 0.076%.

4.3.2 ESTIMATION AND INTERPRETATION OF FISCAL POLICY UNCERTAINTY

The principal objective of my analysis is to investigate the impact of fiscal policy uncertainty on private investment specifically, and on other macroeconomic as well for panel data. For this analysis, key fiscal policy tool is government spending uncertainty. I documented the impact of government spending volatility shocks on private investment and on other macroeconomic variables as well. I have estimated government spending volatility shocks for each country by using GARCH (1) process. We also have discussed the impulse responses of government spending uncertainty on other macro variables.

ESTIMATION AND INTERPRETATION FOR OVERALL SAMPLE

I. IMPACT OF FISCAL POLICY UNCERTAINTY ON INVESTMENT

TABLE N0 4.5: OVER ALL COUNTRIES

LAGS	UC	INV	CONS
UC (1)	0.048	-0.131	0.087
	(0.022)	(0.051)	(0.069)
INV (1)	0.009	0.755	-0.040
	(0.005)	(0.0140)	(0.016)
CONS (1)	-0.005	-0.041	0.706
	(0.005)	(0.0132)	(0.015)
RMSE	1.058	3.011	3.411
R -SQ	0.034	0.830	0.946

Std. Err are in parentheses

Impulse of UC-on-UC
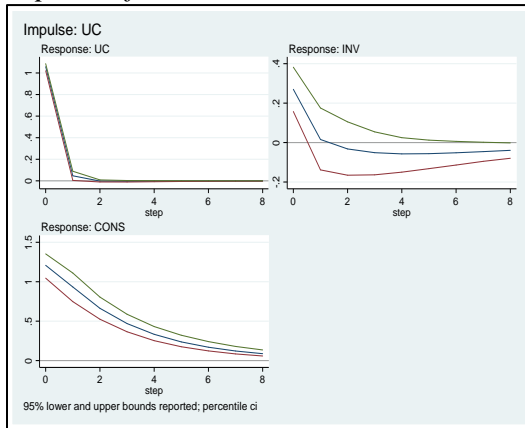
Impulse of UC on INV
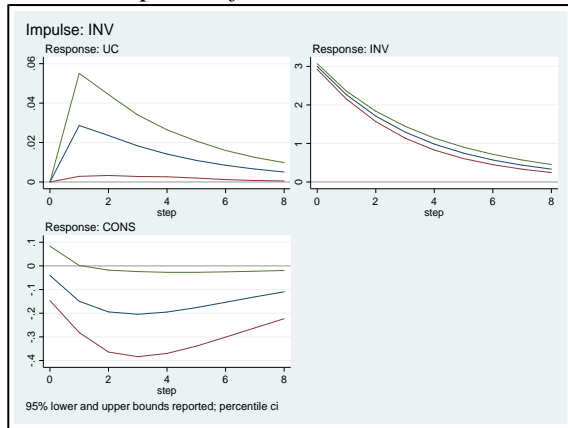
Impulse of UC on CONS
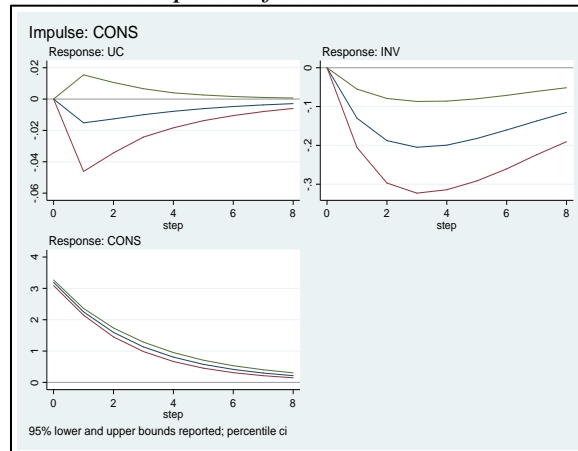
INTERPRETATION

Table 4.5 shows the impact of government spending uncertainty on private investment. Panel vector autoregression (PVAR) with monte Carlo simulation suggested that government spending uncertainty have negative impact on private investment. It is noticed that government spending uncertainty coefficient showed significant negative sign. This suggests that an increase in public spending uncertainty percentage of GDP leads to decrease in investment by 0.131%

Impulse response is a shock to Vector autoregression model (VAR). Impulse response analyzes the responsiveness of endogenous variable (dependent variable) in VAR model when shock is set to error term. Unit shock is put in to each variable and then see its impacts on VAR model. Impulse response given above shows the response of uncertainty to uncertainty in figure 1, then impulse response of investment to uncertainty in figure 2 and lastly response of consumption to uncertainty in figure 3. Our major objective is to investigate the response of private investment to uncertainty shocks in government spending. Blue line which is in middle indicates the impulse response function while the red lines which is upper and lower bound are reported 95% confidence intervals. So, our impulse response function always lies within the 95% confidence interval. We discussed here the response of investment to government spending uncertainty. Initially investment increases in period 1, but after period 1, private investment starts declining. It declines gradually till period 8. Its mean that due to uncertainty shocks in government expenditure, response of investment is declining. A one standard deviation changes in government spending uncertainty initially small rise in investment in period 1 and then from period 1 to period 8 investment gradually declines.

II. IMPACT OF FISCAL POLICY UNCERTAINTY ON MACROECONOMIC VARIABLES

TABLE N0 4.6: OVER ALL COUNTRIES

	UC	GDP	INV	INF	UN
UC (1)	0.038	0.074	-0.056	-0.019	0.090
	(0.022)	(0.065)	(0.061)	(0.080)	(0.019)
GDP (1)	-0.002	0.323	0.146	0.103	-0.061
	(0.007)	(0.021)	(0.019)	(0.025)	(0.006)
INV (1)	0.005	0.012	0.745	0.001	0.004
	(0.005)	(0.002)	(0.001)	(0.019)	(0.005)
INF (1)	0.009	-0.010	-0.004	0.456	0.004
	(0.003)	(0.008)	(0.007)	(0.009)	(0.002)
UN (1)	-0.043	0.238	-0.033	-0.037	0.879
	(0.011)	(0.034)	(0.032)	(0.009)	(0.010)
RMSE	1.052	3.200	2.978	3.922	0.949
R-SQ	0.045	0.329	0.834	0.721	0.971

Std. Err are in parentheses
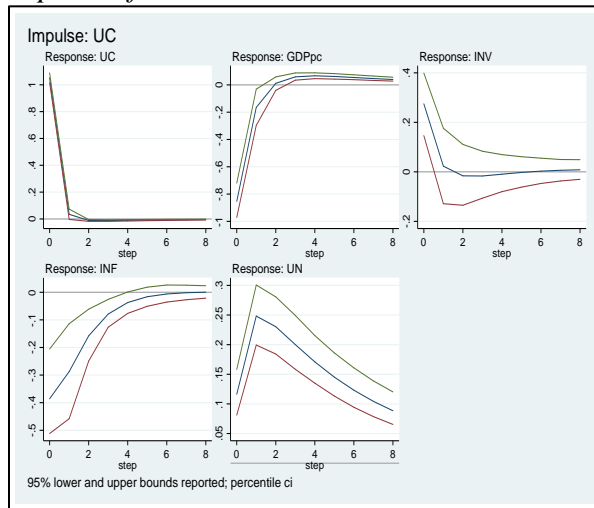
Impulse of UC-to-UC

Impulse of GDPpc to UC
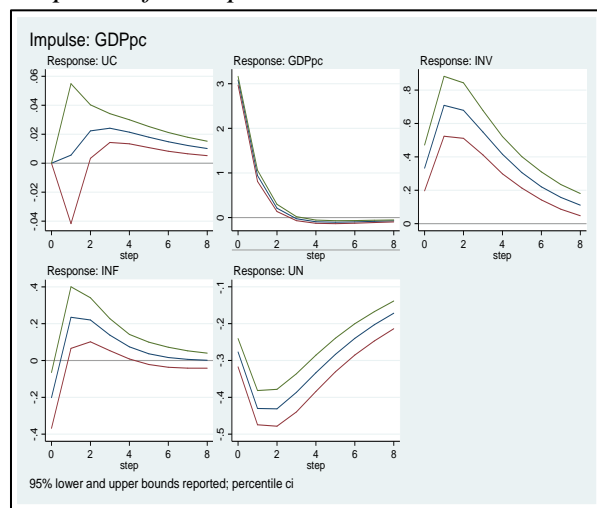
Impulse of INV to UC
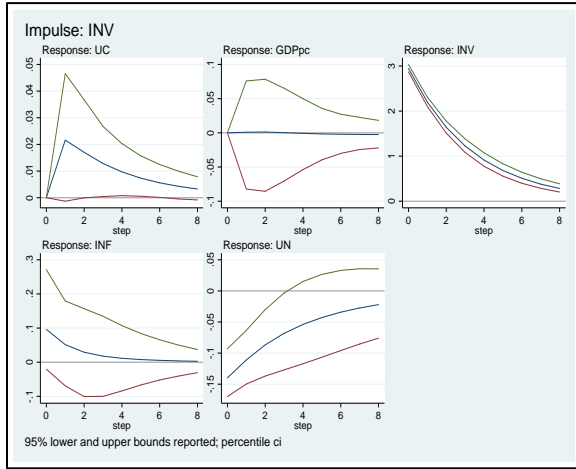
Impulse of INF to UC
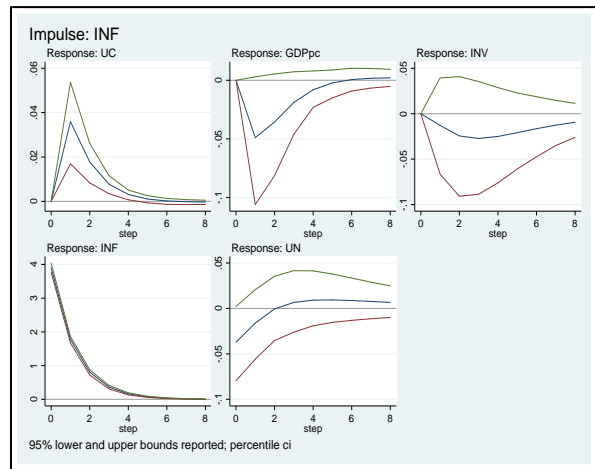
Impulse of UN to UC
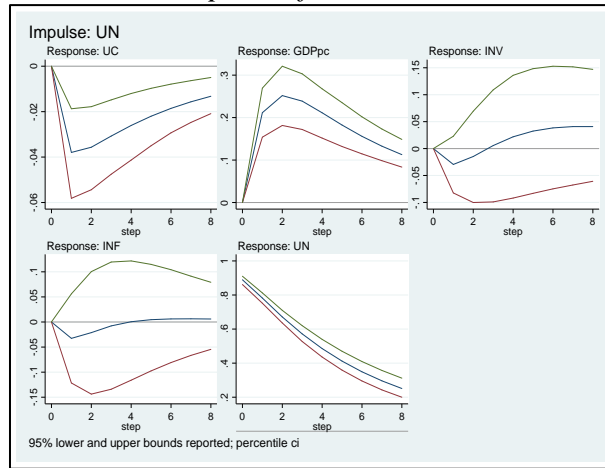
Table 4.6 shows the impact of government spending uncertainty shocks on macroeconomic variables. At first difference coefficient of uncertainty is negative with investment and inflation. Both are statistically significant at 10% level of significance. Results of panel VAR in table 4.6 indicates that due to shock in uncertainty investment and inflations falls at first difference. 1 standard deviation shock in government spending uncertainty as percentage of GDP will lead to decrease in inflation by 0.019%. While investment will decrease by 0.056% in response to government spending volatility shocks by 1 unit.

Impulse responses are the shock of VAR model. Figure 3 shows the impulse response of investment to uncertainty while figure 4 is response of inflation to government spending uncertainty. Blue line which is in middle shows the impulse response. Figure 4 indicate that one standard deviation changes in government spending uncertainty initially raises inflation in period 1. After period 1 it sharply declines and hits steady state at period 6. While figure 3 shows that when there is 1 standard deviation shock in government spending uncertainty then initially response of private investment is positive and increasing. From period 1 investment starts decline sharply and goes on declining. Response of private investment is declining in response to 1 standard deviation change in government spending volatility shocks. Impulse responses are actually analyzing the responsiveness of endogenous variable (dependent variable) in VAR model when shock is set to error term. Unit shock is put in to each variable and then see its impacts on VAR model.

Impulse response of GDPpc is also increasing initially till period 4. Then from period 4 to period 8 it declines gradually. It indicates that 1 standard deviation change in government spending volatility will affect GDPpc, initially it raises and then after period 4 it starts declining.

Table 4.6 shows the uncertainty impact of public expenditure as percentage of GDP on the key macroeconomic variables.

III. IMPACT OF FISCAL POLICY UNCERTAINTY ON MACROECONOMIC VARIABLES (WITH CONSUMPTION)

Table 4.7 shows the impact of government spending uncertainty shocks on macroeconomic variables.

TABLE N0 4.7: OVER ALLCOUNTRIES:

LAGS	UC	GDP	CONS	INF	UN
UC (1)	0.042	0.052	0.009	-0.061	0.086
	(0.022)	(0.067)	(0.070)	(0.082)	(0.019)
GDP (1)	-0.002	0.330	-0.056	0.109	-0.059
	(0.007)	(0.021)	(0.022)	(0.025)	(0.006)
CONS (1)	-0.002	0.026	0.705	0.042	0.005
	(0.005)	(0.014)	(0.015)	(0.017)	(0.004)
INF (1)	-0.045	0.220	0.048	0.456	0.004
	(0.011)	(0.033)	(0.008)	(0.009)	(0.002)
UN (1)	0.009	-0.010	0.027	-0.054	0.875
	(0.003)	(0.008)	(0.035)	(0.041)	(0.009)
RMSE	1.052	3.198	3.383	3.917	0.949
R-SQ	0.045	0.329	0.946	0.723	0.972

Std. Err are in parentheses

Impulse response of UC-to-UC
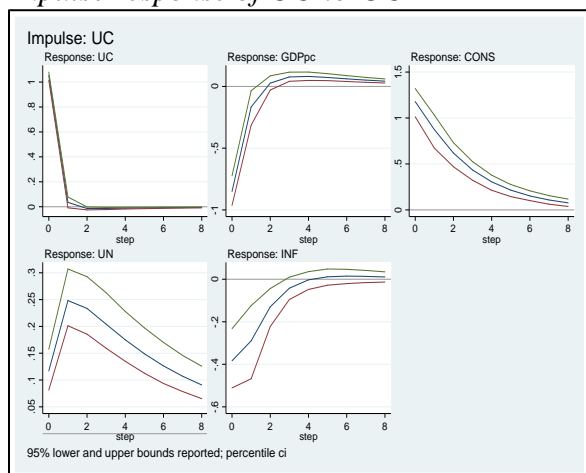
Response of GDP to UC
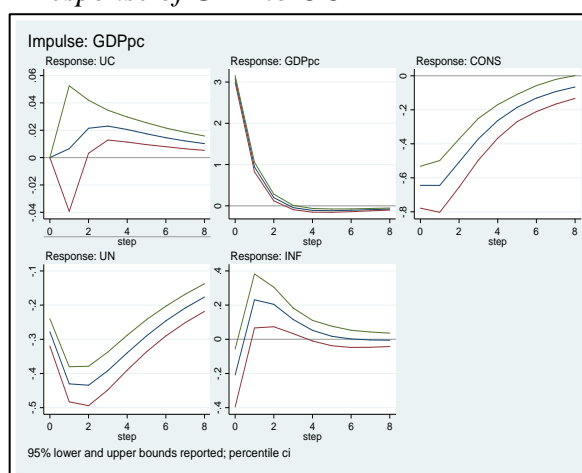
Response of CONS to UC
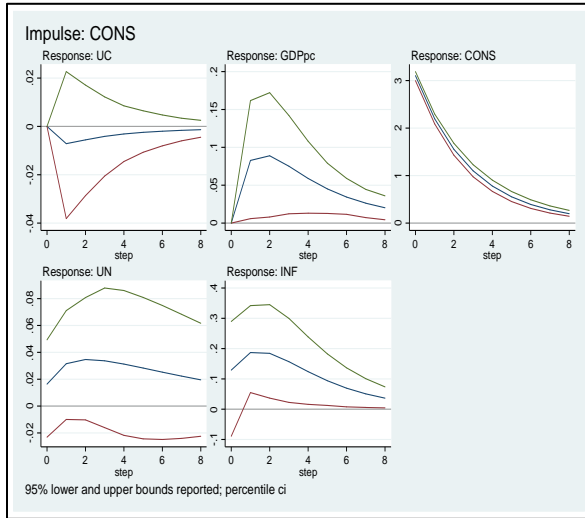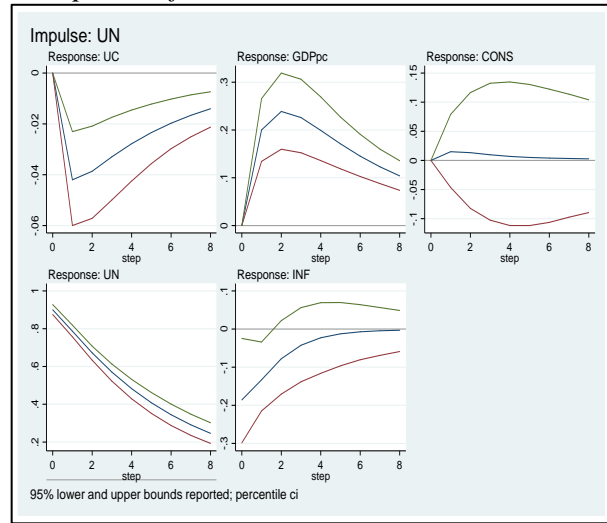
Response of UN to UC

Response of INF to UC
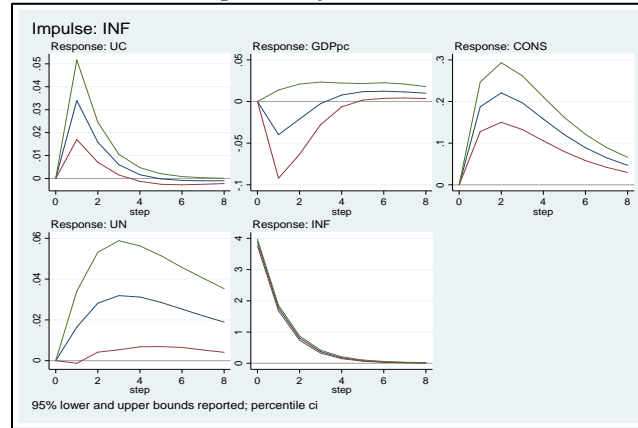
By using panel var with monte Carlo simulation we find that at first lag government spending uncertainty have negative impact on inflation. Coefficient of uncertainty is negative with 10% level of significance. It explains that 1 SD change in uncertainty lead to 0.06% decrease in inflation at first lag. All other variables having positive relationship with uncertainty at first difference. Figure 5 shows the impulse response of inflation to government spending uncertainty. Blue line which is in middle shows the impulse response. Figure 5 indicate that one standard deviation changes in government spending uncertainty initially raises inflation in period 1. After period 1 it sharply declines and hits steady state at period 4 and become negative after period 4. Response of inflation is sharply declining and becoming negative in response to 1 standard deviation change in

government spending volatility shocks. Response of unemployment is increasing in response to 1 standard deviation change in government spending volatility shocks. Initially it is decreasing and after period 1 it starts rising sharply. Impulse response of GDPpc is also increasing initially till period 4. Then from period 4 to period 8 it declines gradually. It shows that 1 standard deviation change in government spending volatility shock will affect GDPpc in a way that, initially it raises and then after period 4 it starts declining.

Impulse response of consumption is interesting which is shown in figures 4 above. It is below of steady state level and negative, when standard deviation of government spending uncertainty increases by 1 unit then consumption declines more but after first period it start increasing and come closer to steady state level and at point 8 it touches the steady state level.

ESTIMATION AND INTERPRETATION FOR UPPER MIDDLE-INCOME COUNTRIES

I.   IMPACT OF FISCAL POLICY UNCERTAINTY ON INVESTMENT

TABLE N0 4.8: UPPER MIDDLE-INCOME COUNTRIES.

LAGS	UC	CONS	INV
UC (1)	0.098	0.137	-0.307
	(0.028)	(0.074)	(0.068)
CONS (1)	-0.006	0.795	-0.019
	(0.006)	(0.016)	(0.015)
INV (1)	0.026	0.002	0.815
	(0.006)	(0.017)	(0.016)
RMSE	0.909	2.250	2.438
R-SQ	0.049	0.832	0.968

Std. Err are in parentheses
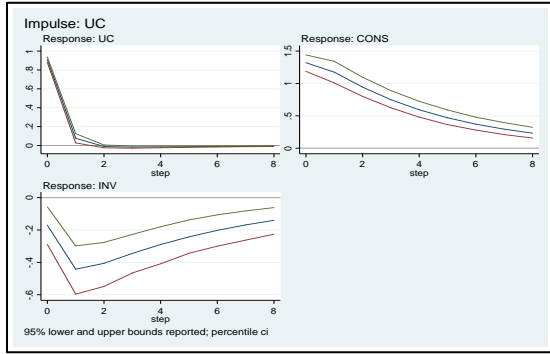
Response of UC-to-UC

Response of CONS to UC
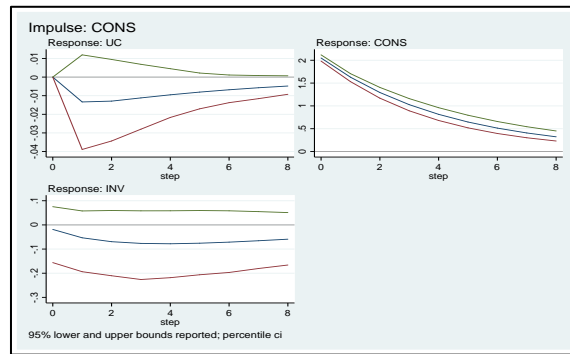
Response of INV to UC
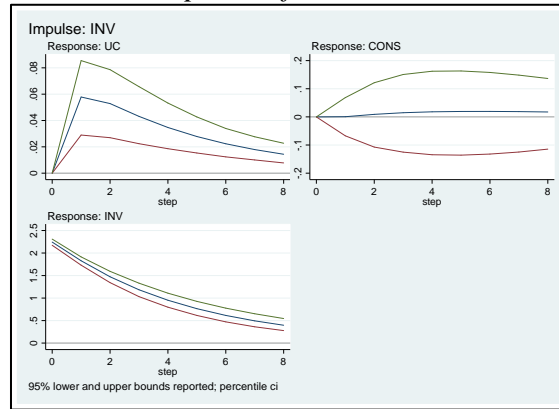
Table 4.8 shows the impact of government spending uncertainty on private investment for upper middle-income countries. Panel vector autoregression (PVAR) with monte Carlo simulation suggested that at first difference government spending uncertainty have negative impact on private investment for upper middle-income countries as well. It is noticed that government spending uncertainty coefficient showed significant negative sign. While consumption have positive response at first lag of government spending uncertainty.

Impulse response in above figures shows the response of uncertainty to uncertainty in figure 1, then impulse response of consumption to uncertainty in figure 2 and lastly response of investment to uncertainty in figure 3. Our major objective is to investigate the response of private investment to uncertainty shocks in government spending. Blue line which is in middle indicates the impulse response function while the red lines which is upper and lower bound are reported 95% confidence

intervals. So, our impulse response function always lies within the 95% confidence interval. Initially investment increases in period 1, but after period 1, private investment starts declining and declines gradually till period 8. Its mean that due to uncertainty shocks in government expenditure, response of investment is declining. A one standard deviation changes in government spending uncertainty initially small rise in investment in period 1, after that from period 1 to period 8 investment gradually declines
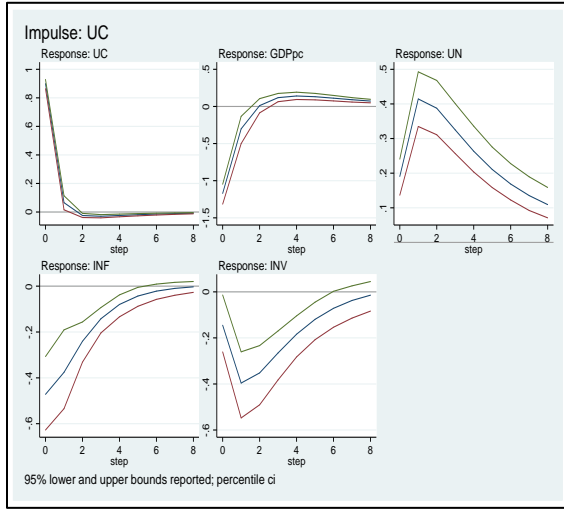
II.   IMPACT OF FISCAL UNCERTAINTY ON MACROECONOMIC VARIABLE

TABLE 4.9: UPPER MIDDLE-INCOME COUNTRIES:

LAGS	UC	GDP	UN	INF	INV
UC (1)	0.089	0.139	0.175	-0.034	-0.155
	(0.028)	(0.095)	(0.033)	(0.092)	(0.069)
GDP (1)	-0.003	0.425	-0.086	0.113	0.134
	(0.008)	(0.026)	(0.009)	(0.025)	(0.019)
UN (1)	-0.044	0.249	0.887	-0.049	0.012
	(0.011)	(0.037)	(0.013)	(0.035)	(0.026)
INF (1)	0.015	-0.040	0.020	0.407	-0.029
	(0.004)	(0.013)	(0.004)	(0.012)	(0.009)
INV (1)	0.019	-0.031	0.025	0.077	0.802
	(0.007)	(0.023)	(0.008)	(0.022)	(0.016)
RMSE	0.899	3.083	2.204	2.987	1.071
R-SQ	0.071	0.399	0.839	0.659	0.965

Std. Err are in parentheses

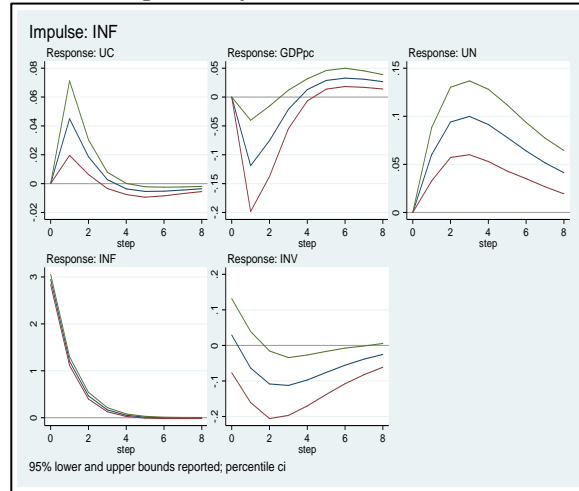*Response of UC-to-UC*

Response of GDPpc to UC
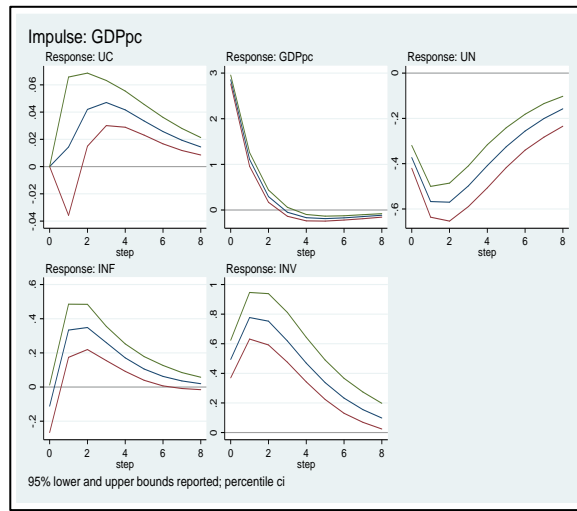
Response of UN to UC
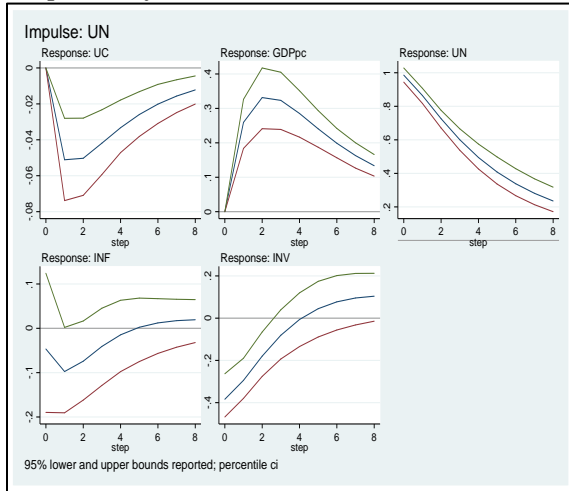
Response of INF to UC
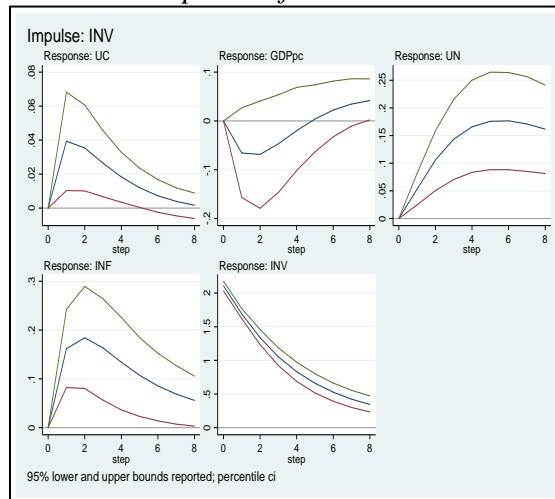

Response of INV to UC

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Table 4.9 shows the impact of government spending uncertainty shocks on macroeconomic variables. At first difference coefficient of uncertainty is negative with investment and inflation. Results of panel VAR indicates that due to increase in uncertainty investment and inflations falls at first difference. 1 SD change in government spending uncertainty shocks as percentage of GDP will lead to decrease in inflation by 0.034%. While investment will decrease by 0.155% in response to government spending volatility shocks in middle income countries

Above responses revealed that at first difference private investment and inflation falls due to uncertainty volatility shock. Figure 5 shows the impulse response of investment to uncertainty while figure 4 is response of inflation to government spending uncertainty. Blue line which is in middle shows the impulse response. Figure 4 indicate that one standard deviation changes in government spending uncertainty initially raises inflation in period 1. After period 1 it dies off and hits steady state at point 4. Inflation keeps decreasing after hitting steady state and become negative. While figure 5 shows that when there is 1 standard deviation shock in government spending uncertainty then initially response of private investment is positive and increasing. After period 1 investment starts decline sharply and touches steady state at point 8. Response of private investment is declining in response to 1 standard deviation change in government spending volatility shocks. Impulse response of GDPpc is also increasing initially till period 4. Then from period 4 to period 8 it declines gradually. It indicates that 1 standard deviation change in government spending volatility will affect GDPpc, initially it raises and then after period 4 it starts declining.

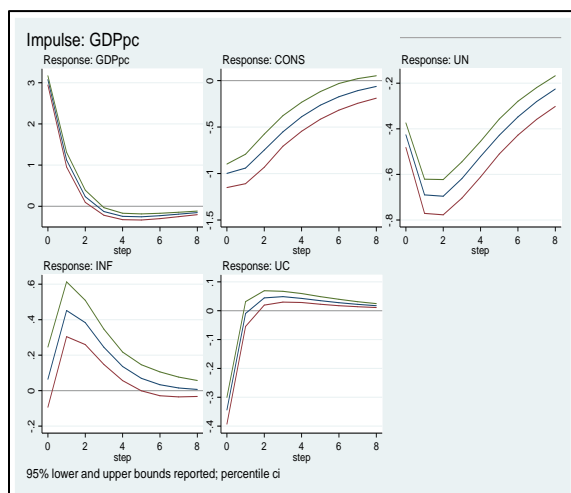## III. IMPACT OF FISCAL UNCERTAINTY ON MACROECONOMIC VARIABLES (WITH CONSUMPTION)

Table given below is showing the impact of government expenditure uncertainty on macroeconomic variables for upper middle-income countries.
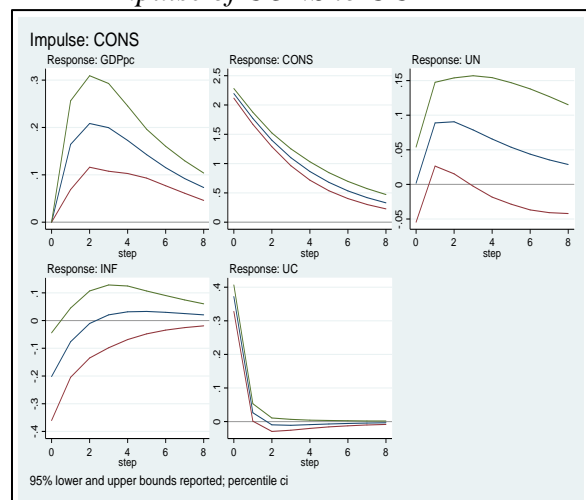
TABLE N0 4.10: UPPER MIDDLE-INCOME COUNTRIES

LAGS	UC	GDP	CONS	INF	UN
UC (1)	0.101	0.039	0.081	-0.012	0.166
	(0.029)	(0.099)	(0.078)	(0.096)	(0.035)
GDP (1)	-0.001	0.424	-0.045	0.126	-0.081
	(0.008)	(0.025)	(0.020)	(0.025)	(0.009)
CONS (1)	-0.004	0.064	0.797	0.005	0.014
	(0.006)	(0.020)	(0.016)	(0.020)	(0.007)
INF (1)	0.015	-0.041	0.052	0.407	0.019
	(0.004)	(0.013)	(0.010)	(0.013)	(0.005)
UN (1)	-0.052	0.237	-0.046	-0.091	0.869
	(0.004)	(0.036)	(0.035)	(0.013)	(0.013)
RMSE	0.902	3.075	2.412	2.999	1.074
R-SQ	0.066	0.402	0.969	0.656	0.965

Std. Err are in parentheses

Impulse of GDPpc to UC
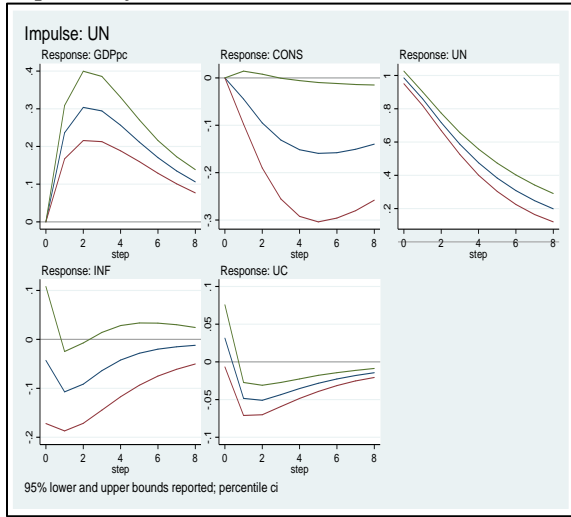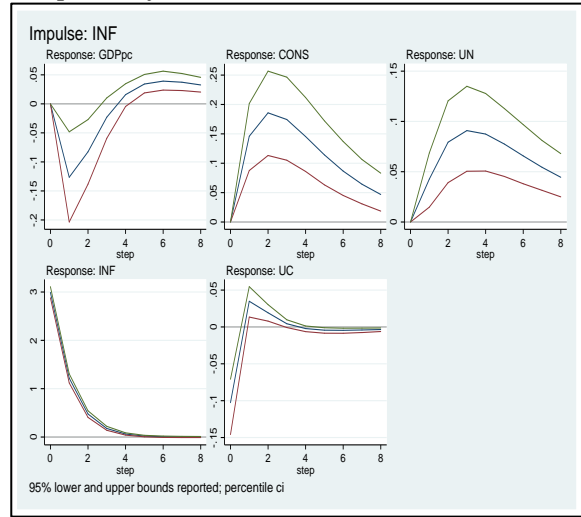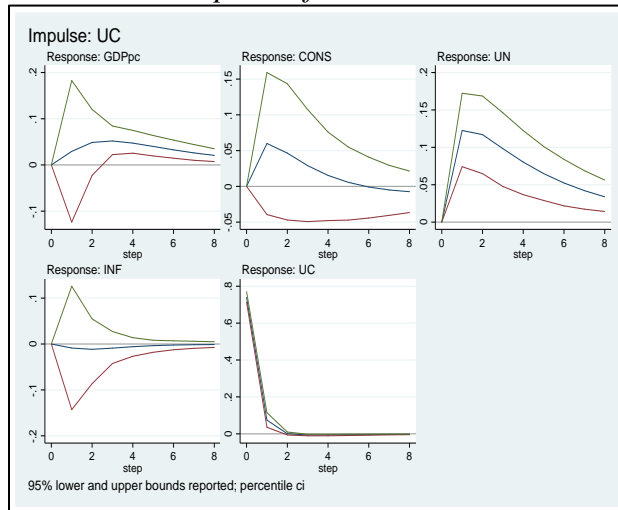
Impulse of CONS to UC

Table 4.10 shows the impact of government spending uncertainty on macroeconomic variables for upper middle-income countries. Government spending uncertainty have negative coefficient which suggests that a shock in government spending uncertainty leads to 0.012% decrease in inflation. All the other variables are increasing at first difference in response to shock in government uncertainty.

Response of inflation to government spending uncertainty. Results indicate that one standard deviation changes in government spending uncertainty initially lower inflation in period 1. After

period 1 it sharply rising and hits steady state at period 4, it goes above the steady state line after period 4, and become positive. Response of inflation is sharply rising and becoming positive in response to 1 standard deviation change in government spending volatility shocks. Response of unemployment is increasing in response to 1 standard deviation change in government spending volatility shocks. Initially it is decreasing and after period 1 it starts rising sharply. Impulse response of consumption is also increasing initially and reaches on its peak at point 2 and then after period 2 it starts falling. It shows that 1 standard deviation change in government spending volatility shock will affect consumption in a way that, initially it raises and then after period 2 it starts declining. Impulse response of GDPpc is shown in figures 1 above. It follows decreasing trend and reaches below the steady state level. It indicates that when standard deviation of government spending uncertainty increases by 1 unit then GDPpc declines more and will cross steady state level and become negative.

ESTIMATION AND INTERPRETATION FOR LOW MIDDLE-INCOME COUNTRIES
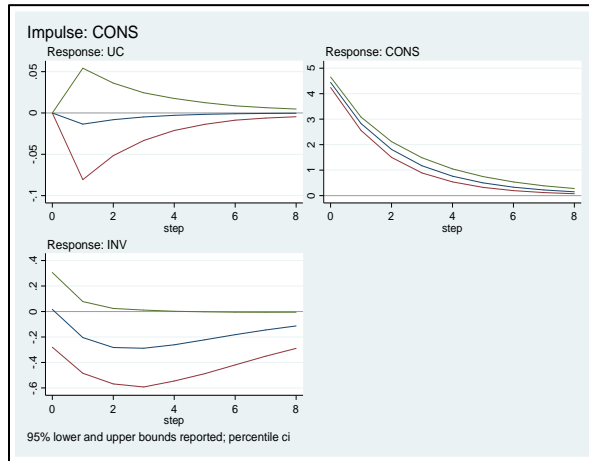
I.   IMPACT OF FISCAL POLICY UNCERTAINTY ON INVESTMEN

TABLE N0 4.11: LOW MIDDLE-INCOME COUNTRIES:

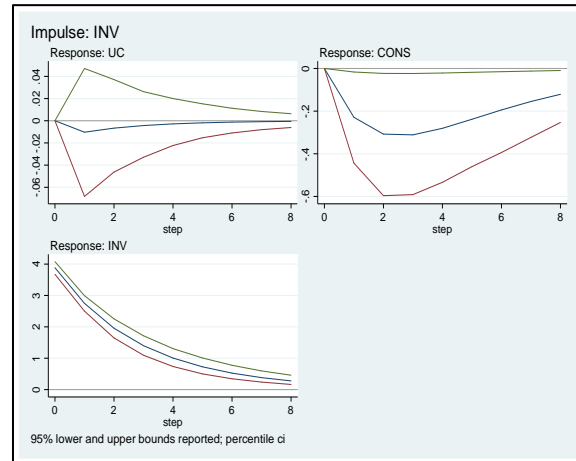| LAGS	UC	CONS	INV
UC (1)	0.007	-0.006	0.018
	(0.035)	(0.126)	(0.109)
CONS (1)	-0.003	0.637	-0.049
	(0.007)	(0.027)	(0.023)
INV (1)	-0.003	-0.059	0.708
	(0.008)	(0.028)	(0.025)
RMSE	1.267	4.574	3.967
R-SQ	0.031	0.896	0.832

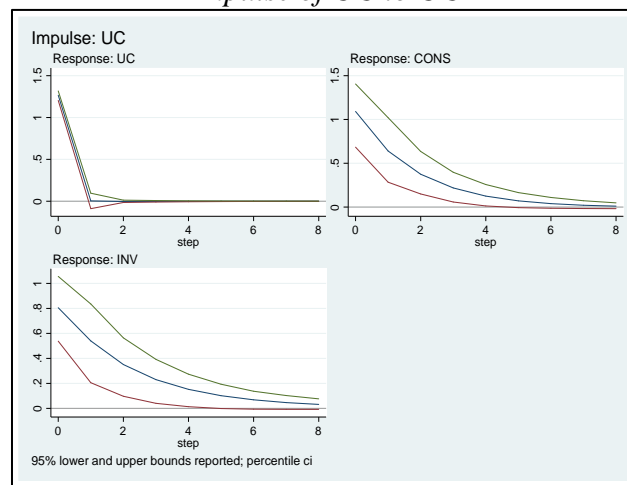*Std. Err are in parentheses*

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Impulse of CONS to UC   *Impulse of INV to UC*

Impulse of UC to UC

By using panel var our results show that in lower income counties investment is increasing in response to government expenditure uncertainty shocks at first lag. Results reveals that if there are shocks in uncertainty then private consumption will increases by 0.018% at first difference. But in lower income countries consumption decreases in response to government spending uncertainty shocks at first lag. Impulse responses show the response of consumption and private investment to government spending uncertainty. Figure 1 documented the Impulse response of consumption to uncertainty response and response of investment to uncertainty is in figure 2. Our main objective

is to investigate the response of private investment to uncertainty shocks in government spending. In lower middle-income countries investment lies below the steady state level which means that it lies in negative region. Initially investment decreases in period 1, but after period 1, private investment starts increasing and reaches on steady state level. Its mean that due to uncertainty shocks in government expenditure, response of investment is negative but rising. A one standard deviation changes in government spending uncertainty leads to, initially small decline in investment in period 1, after that from period 1 to period 8 investment increases and touches steady state level, but this increase is also very small.
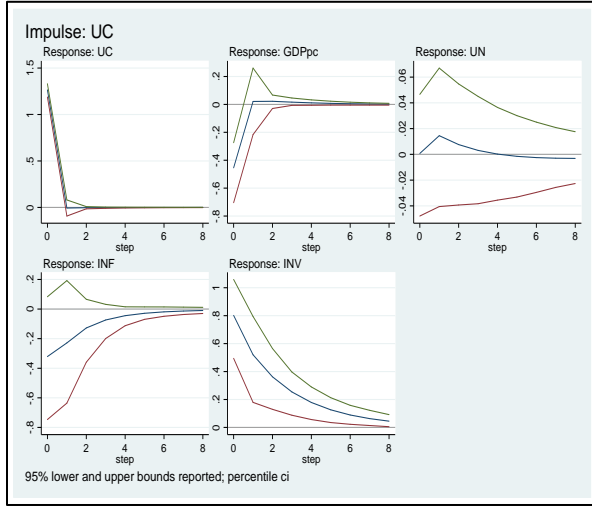
II.   IMPACT OF FISCAL UNCERTAINTY ON MACROECONOMIC VARIABLES

TABLE N0 4.12: LOW-INCOME COUNTRIES

| LAGS	UC	GDP	UN	INF	INV
UC (1)	-0.001	0.057	0.013	-0.011	0.022
	(0.035)	(0.091)	(0.017)	(0.139)	(0.108)
GDP (1)	0.003	0.169	-0.009	0.058	0.145
	(0.013)	(0.035)	(0.006)	(0.054)	(0.042)
UN (1)	-0.013	0.171	0.854	0.203	-0.169
	(0.034)	(0.088)	(0.016)	(0.136)	(0.105)
INF (1)	0.007	0.001	-0.001	0.476	0.005
	(0.004)	(0.001)	(0.002)	(0.014)	(0.011)
INV (1)	-0.003	0.032	-0.009	-0.044	0.699
	(0.008)	(0.021)	(0.004)	(0.033)	(0.026)
RMSE	1.265	3.312	0.608	5.091	3.947
R-SQ	0.035	0.234	0.987	0.736	0.834

Std. Err are in parentheses
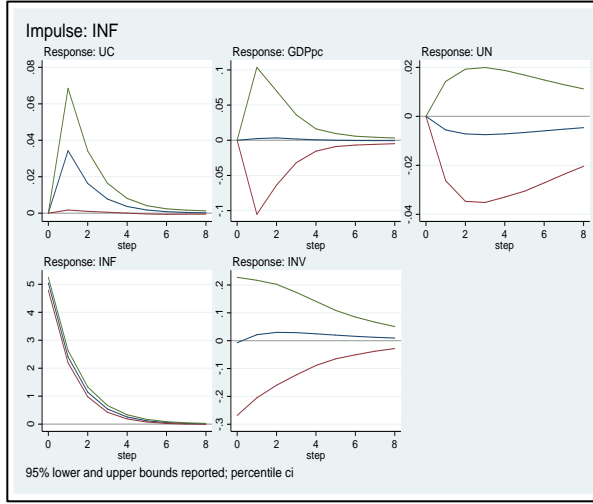
Impulse of UC-to-UC

Impulse of GDPpc to Uc
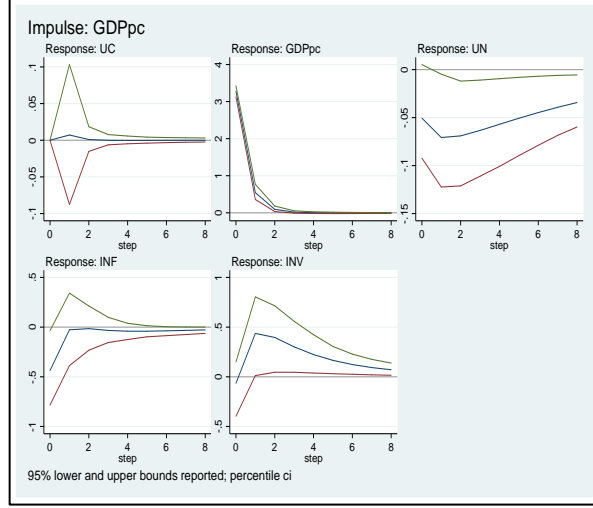
Impulse of UN to UC
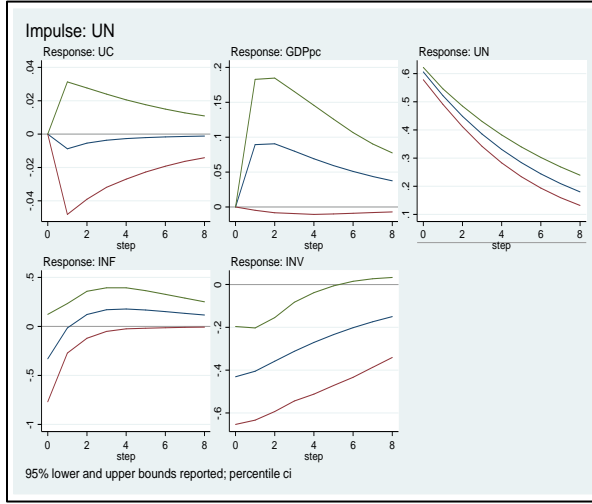
Impulse of INF to UC
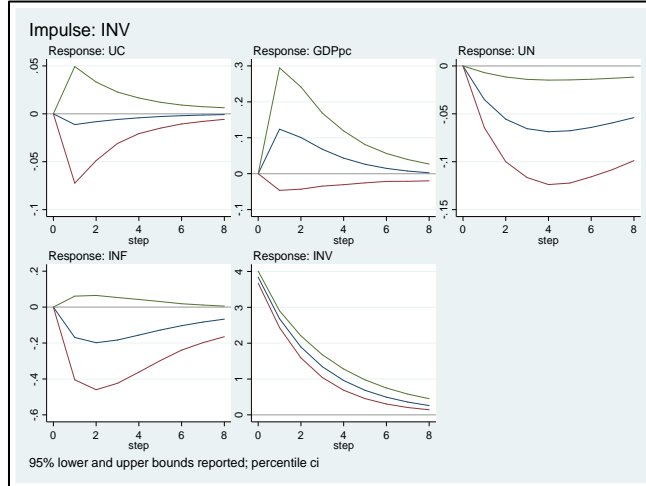

Impulse of INV to UC

Table 4.12 shows the impact of government spending uncertainty shocks on macroeconomic variables in low middle-income countries. Results of panel VAR indicates that due to shock in uncertainty investment increases while inflations fall at first difference in low middle-income countries. Above responses revealed that at first difference private investment rises while inflation falls due to uncertainty volatility shock. Figure 5 shows the impulse response of investment to uncertainty and figure 4 is response of inflation to government spending uncertainty. Inflation response indicate that one standard deviation changes in government spending uncertainty initially raises inflation in period 1. After period 1 it dies off and hits steady state at point 6. In low-income countries investment lies below the steady state level which means that it lies in negative region. Initially investment decreases in period 1, but after period 1, private investment starts increasing and reaches on steady state level. Its mean that due to uncertainty shocks in government expenditure, response of investment is negative but rising. A one standard deviation changes in government spending uncertainty leads to initially small decline in investment in period 1, after that from period 1 to period 8 investment increases, but this increase is also very small.

III.   IMPACT OF FISCAL UNCERTAINTY ON MACROECONOMIC VARIABLES

(WITH CONSUMPTION)

TABLE N0 4.13: LOW MIDDLE-INCOME
COUNTRIES

| *LAGS*	UC	GDP	UN	INF	CONS
UC (1)	-0.001	0.082	0.009	-0.011	-0.0900
	(0.035)	(0.092)	(0.017)	(0.139)	(0.141)
GDP (1)	0.002	0.166	-0.009	0.058	0.078
	(0.014)	(0.035)	(0.006)	(0.054)	(0.054)
UN (1)	-0.009	0.135	0.865	0.203	0.238
	(0.032)	(0.085)	(0.016)	(0.136)	(0.129)
INF (1)	0.007	-0.001	-0.001	0.476	0.478
	(0.004)	(0.009)	(0.002)	(0.014)	(0.014)
CONS (1)	-0.002	-0.012	-0.001	-0.044	0.072
	(0.007)	(0.019)	(0.004)	(0.033)	(0.030)
RMSE	1.265	3.316	0.610	5.079	4.539
R-SQ	0.035	0.232	0.987	0.737	0.898

Std. Err are in parentheses
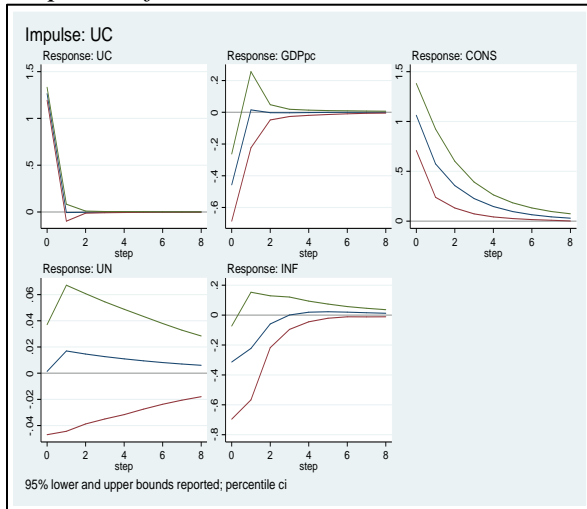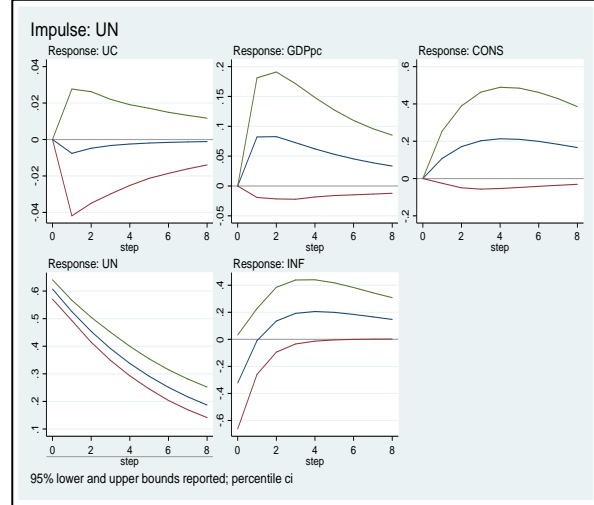
Response of UC-to-UC

Response of GDPpc to UC
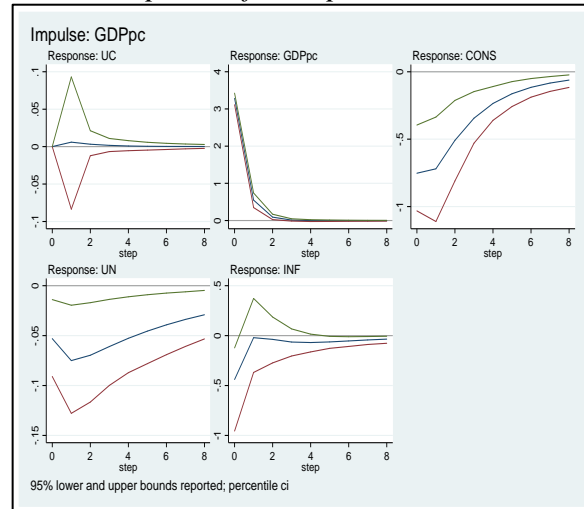
Response of CONS to UC
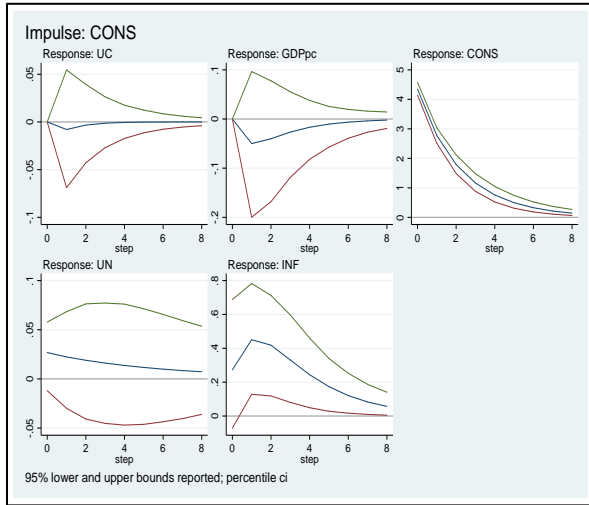
Response of UN to UC

Response of INF to UC
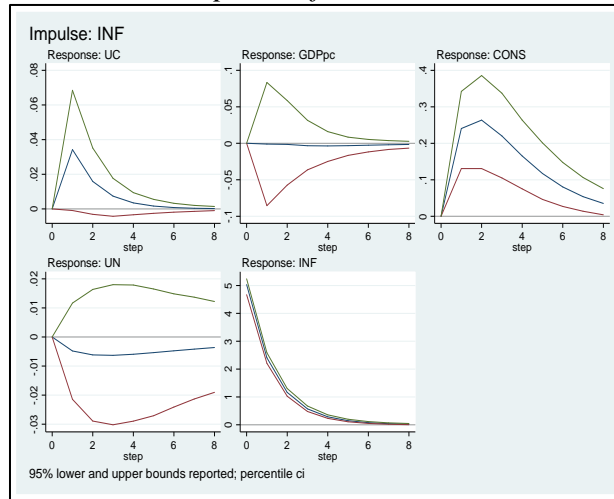
Figure 5 shows the impulse response of inflation to government spending uncertainty. Results indicate that one standard deviation changes in government spending uncertainty initially increases inflation in period 1. After period 1 it starts decreasing and reach at steady state at period 6. Consumption lies below the steady state level mean it is in negative region. Due to 1 standard deviation change in uncertainty consumption slightly decrease and increases again sharply, and reaches on steady state level.

CHAPTER 5

QUALITATIVE ANALYSIS

5.1 INTRODUCTION

This chapter is based on qualitative research methods which include the policy documents, analysis of acts and regulation, expert opinion and, interviews of officials from relevant and concerned ministerial departments.

5.2 INTERVIEW OF OFFICIAL FROM MINISTRY OF FINANCE

Interview were conducted with senior officials of Ministry of finance. Finance Ministry plays a key role in implementing fiscal policy. I visited the ministry of finance and interviewed "Dr. Imtiaz Ahmad" the Economic adviser to better understand the framework, impacts, pros, and cons of fiscal policy uncertainty. A questionnaire was designed to conduct these interviews.

Dr Imtiaz mentioned that fiscal policy tools are either tax collection which is the revenue side of the economy. Revenues maybe Tax revenue or non-tax revenues. While the other tool is the expenditures of the government which is subdivided as either Development Expenditures or Non-Development Expenditures also named as current expenditure which is higher in case of Pakistan as it involves salaries, interest payments, debt repayments etc. As for this study the focus is accumulated government expenditures using the panel data of both developing and less income earning countries and developed or higher income earning countries. Coming to the Fiscal policy, the Ministry of Finance plays its driving role in formulating the fiscal policy while it's implemented by FBR in the same way monetary policy is formulated and implemented by State Bank of Pakistan.

Upon inquiry on what makes government expenditures uncertain, Dr Imtiaz replied that the government spending depends on multiple factors which may be economic, administrative,

political as well as external factors. Government spending is effected by the revenue collection as government can spend while considering their position of revenues they have collected, similarly there may be certain factors in system which can bring uncertainty which can directly and indirectly effect the government spending or there may be some political uncertainty that can impact the government spending as when government change, new governments come into power with new focus and different polices just for the sake of discussion in case of Pakistan, the previous governments had more focus on building more infrastructure such as Highways, power projects, hospitals etc. which can be categorized as hard infrastructure. While on the other hand, the present regime seems to focus on social sector through projects such as Ehsaas which can be categorized in form of soft infrastructure. So, it is clear that the fiscal policy doesn't remain certain when government changes.

Similarly there is another variable that can impact the government spending is the external factors specifically when we talk about international donor agencies or developed economies with which we are integrated, any shock in those economies can result in failure to fulfil the commitment of providing assistance in form of debt or aid, for instance the present case of Ukraine Russia war in which Pakistan has been facing external pressure to raise voice against Russia or otherwise sanctions may even be implemented or EU may cancel the GSP+ status of Pakistan in such case. Moreover, in case of developing countries, weak institutions are also a hurdle for government to ensure smooth and certainty in government's behavior. To explain this matter through an example one can, note that a major hurdle in governments spending is court decisions on different projects has impacted the project's completion period such as the case of orange line bus and Reko Diq project etc. where the decision of court had impacted governments spending as well. In addition

to that, due to failure for institutions to ensure coordination another factor that creates uncertainty for the system

Dr Imtiaz was inquired about how he thinks government can tackle uncertainty in government expenditures. He argued that government expenditure depends on revenues of the government which is either through tax collection which has been discussed before or it may be through borrowing by government. Now the government borrows from multiple sources which is either borrowing domestically from State Bank or from commercial banks or even soft loans are raised through National Savings and T Bills etc. or it may be through foreign sources which can be categorized as bilateral (countries aid such as recently from KSA or China) or multilateral (donor agencies such as World Bank or IMF). This is helpful in tackling uncertainty in government spending but it can be reduced by reducing reliance on all forms of borrowings, and focusing on generation of more tax revenues. Similarly, uncertainty in government spending can also be reduced or tackled if the decision making is transparent, rules based, and time is managed efficiently which can also minimize uncertainty. And finally, it is also necessary to ensure that government policy uncertainty is minimized as it can also lead to uncertain environment in economy.

It was also brought under discussion that what would be the impact of different policies especially the monetary policy in Pakistan on government's fiscal behavior and its policy. Dr Imtiaz answered that as the interest rate is a tool for monetary policy which is reviewed in every quarter as SBP announced new policy, the focus is on inflation rate and nominal interest rate which is always kept higher than inflation rate. The government and monetary regulator change interest rate by considering inflation and aggregate demand of the economy. Coming to how it impacts fiscal policy, the very first impact is on the government's borrowing behavior as interest payments

increase that raises fiscal deficit. Hence the non-development or current expenditures of the government will rise which is met by cutting development expenditure or PSDP (Public Sector Development Programme). This can result in higher non-development spending and lower development expenditures that can actually impact the overall development and growth of economy.

Another important matter to discuss was as how does political instability leads to fiscal uncertainty. Dr Imtiaz believed that as most of the economies have their own charters of economy which in case of Pakistan does not exist as in case of Pakistan the opposition and government has a consensus with each other and in many a times, they have their own political commitments so priority changes creating uncertainty especially when there is regime change in the country.

So, question is as how uncertainty in fiscal variables impact Pakistan economy? He argued that fiscal uncertainty can lead to disturbance in government borrowing or debt, disturbance in tax collections and as discussed, it can also disturb the government spending. In case let's assume that due to uncertainty or de-stability the government cuts development expenditure for a given year such as funds are not released for completion of a hospital, school, power generation unit, a dam or a highway that will result in delay in its completion. This will result in delays in its post completion benefits such as the employment that it would create would be delayed or the revenue that it would generate will also be delayed. Hence due to postponing of any expenditures, the impact will be on the project cycle which will also cause the cost to go up which can also disturb other macroeconomic variables; badly impacting economy.

Additionally, he added that when government debt increases in case, it is necessary to understand its terms and conditions and amount which define its impact. The good or bad impact of debt is defined by the utilization of debt such as it may be utilized for any project that can earn revenue

(roads, dams and power projects) which will help repay it. So, for a good debt, it's necessary that it is utilized for productive utilization that will surely not create problem if government debt increases. In the same way there may be good tax system which include taxes that support businesses, its welfare losses are low, and its benefits are more than its costs.

Finally, Dr Imtiaz discussed the results of my research by arguing when the government spending is uncertain then the private investor will postpone their investment spending and go in wait and see position. Private investor will always wait for government to take the leap and provide an environment that is fit for their investments to bear fruit. That maybe through fiscal incentives otherwise investments in the country will fall, which is a component of aggregate demand which can impact prices. Hence market demand will fall. While if we think in case of low-income countries, as the results show that their consumption in falling which is due to spending uncertainty of the government. As it is already discussed that the poor segment of society spends majority of their income rather than saving it. With lower incomes arising due to lower government spending, there will be less job opportunities and so consumption will fall.

CHAPTER 6

CONCLUSION AND POLICY RECOMMENDATION

6.1 INTRODUCTION

Chapter 6 is divided into two sections. First section will show summary and conclusion of the research findings and the second section will present the policy recommendations which are based on empirical results.

6.2 SUMMARY AND CONCLUSION

Fiscal volatility shocks and fiscal policy shocks are having first order impacts on economic activities. Taxation and public spending can affect consumption and saving behavior of household, borrowing and investment choices of corporates, and key macroeconomic variables for instance inflation. In economics, studies about fiscal policy encompasses a broad area of literature. Most of the studies focuses on public spending or optimal taxation and their effects on consumption or output multiplier. likewise, government spending uncertainty or tax rate uncertainty can adjust the process of decision making faced by firms and economic agents. However, this research investigated the impact of government spending uncertainty on private investment and impact of fiscal variables on macroeconomic performance for panel data.

Employing analysis of panel data technique with random effect and fixed effect model to find out the impacts of fiscal variable on macroeconomic performance and then for the same panel data we estimated panel var and investigated the impacts of government spending volatility shocks on private investment. Based on these models it is found that uncertainty in the fiscal variable effect macroeconomic performance negatively. In the whole sample all the variables decline due to uncertainty in fiscal variables. Uncertainty in Government Expenditure and government debt have

significant negative impact on GDP per capita at 5% level of significance. Consumption and unemployment decrease due to fluctuations in tax receipts. At 5% level of significance, Government expenditure negatively effects inflation in overall sample. All the fiscal variables have statistically significant indirect relationship with investment at 5%.

In upper middle-income countries government expenditure and government debt effecting inflation and GDP per capita growth negatively. At 5% level of significance, fiscal variables significantly declining private investment in upper middle-income countries. Consumption and unemployment decrease in response to tax receipts in both, upper middle income and lower middle-income countries significantly at 5% and 10% level of significance. In lower middle-income countries unemployment and inflation decrease due to increase in government consumption expenditure, while investment decreases due to rise in government debt. Fiscal variables also affecting GDP per capita growth negatively.

In overall sample and upper middle-income countries, investment is declining in the response to each fiscal variable. On the other hand, in low middle-income countries investment is significantly declining in response to Government debt only. Likewise, GDP per capita growth falls in result to government expenditure and government debt in overall sample and in upper middle-income countries. However, in lower middle-income countries GDP decreases concerning all fiscal variables. Tax receipts negatively affecting unemployment in upper middle-income countries and in overall sample. On the other hand, in low middle-income countries unemployment is declining because of increase in government expenditure and tax revenue. Hence, this comparison shows that for these macro variables (investment, unemployment and GDP per capita) upper middle-income countries are consistent with the overall sample. Consumption is negatively affected by increasing in tax receipts, in upper middle income, low middle income and in overall sample as

well. Anymore addressing inflation, low middle-income countries are consistent with overall sample. Government expenditure have negative impact on inflation in overall sample and in low middle-income countries. However, in middle income countries inflation decrease because of government expenditure and government debt.

Employing analysis of Panel vector autoregression on panel data to find out the impact of government spending uncertainty shocks on private investment. We documented that in overall sample private investment decreases due to uncertainty shocks in government consumption expenditure. Private Investment decreases due to one standard deviation shock in government spending expenditure. Results from upper middle-income countries also revealed that due to one standard deviation shock in government spending uncertainty, private investment falls. Although in low middle-income countries uncertainty in government expenditure have positive impact on private investment. Our results of overall sample and upper middle-income countries for private investment are consistent with (Belianska, Eyquem et al. 2018). They find that uncertainty in government spending will significantly lower consumption, investment, and inflation in VAR for the EURO area. This paper basically shows the impact of fiscal policy uncertainty on investment. In case of low middle-income countries our results are consistent with (Belianska, Eyquem et al. 2018) for consumption. Our results revealed that in low middle-income countries, consumption decreases due to one standard deviation change in government spending uncertainty. Although inflation decreases in response to one SD change in uncertainty in upper middle income, low middle-income countries and in overall sample. Hence, we concluded that effect of government spending uncertainty is not negligible, it decreases private investment, inflation and total consumption in panel data.

Results are varied across income groups because developing countries have higher volatility in GDP growth, exchange rates and stocks markets than developed countries. In developing countries firms and households faces huge variety of micro and macro risks. Fiscal policy is slightly procyclical or a cyclical in developing countries while in upper income economies fiscal policy is counter cyclical. Specifically, correlation between GDP and fiscal balance is positive over business cycle in industrial countries while in low-income countries GDP correlation of primary balance is close to zero or slightly negative. Additionally, political instability, fear of war, oil prices fluctuations and debt burden are higher in low-income countries due to which the impact of uncertainty varies in both groups.

6.3 POLICY RECOMMENDATION

A policy recommendation is proposed which is grounded on analysis of my research. As public spending policy is an important fiscal policy tool of economy Private sector needs clear communications to alleviate the adverse impact of uncertainty. Clear guidance and counselling about future paths of government spending can help to alleviate the adverse impacts of uncertainty. Pre-proclamation of spending plans should propose. There is need to ensure political stability in the country to boost the confidence of investors and households. Furthermore, major fiscal policy uncertainty sources are government debt, uncertainty about future payments etc. To intensify the impact of fiscal stimulant plans, it is necessary to reduce public debt. Government debt should be allowed to increase as a percentage of GDP. Because allowing government debt to stay high up would crowd out private investment and reduces fiscal space for unforeseen developments.

6.4 LIMITATION AND FUTURE RESEACH DIRECTION

I have taken three fiscal variables (government expenditure, government debt and tax receipts) and investigated their effect on macro variables like GDP per capita, private investment, total consumption, unemployment, and inflation consumer price, for panel data of 122 countries and time period of 20 years from 2000FY to 2019FY. Limitation of my study is that we dropped transfer payments which is one of the fiscal variables. We dropped this variable due to unavailability of data for my panel countries. So, for the future research transfer payment could be taken with other three mentioned variables and then their impact on major economic variables could be checked for panel data.

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