The economic cost of the fiscal policy uncertainty in Pakistan

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PIDE2018FMPHILECO17

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(2020)

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CERTIFICATE

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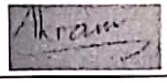

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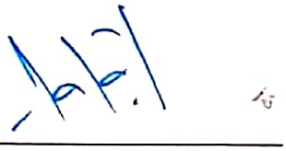

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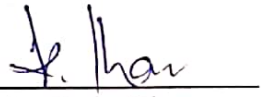

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I Sheeba Waheed solemnly declare and affirm on oath that I myself have authored this MPhil Thesis with my own work and means, and I have not used any additional means except those I have explicitly mentioned in this report. All items copied from internet or other written sources have been properly mentioned in quotation marks and with a reference to the source of citation.

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Acknowledgement

First, I would like to thanks to Almighty Allah who has given me this opportunity of research because without His help and eternal blessing I would have been unable to complete this thesis. I want to express height of gratitude to my thesis supervisor and mentor Dr. Nasir Iqbal for his encouragement, intellectual advice and guidance. I really appreciate him the way he supported and showed his kindness towards me. I thank him from the core of my heart. I am also grateful to all teachers of my whole life in present institution as well as from the previous institutions. I would like to thank all the fellow PIDEANS. I thank them all for their support and help. They made the time I have spent in PIDE truly enjoyable and memorable, May Allah bless them. But not the least, I would like to express my deepest appreciation to my parents especially to my mother for her support at every stage of life who is truly a motivator for my hard work and success, to my brother and sister, for their understanding, love, encouragement and selfless support in every aspect during the course of the study. I would like to thank to all other family members, friends and loved ones who prayed for my success. I am grateful to all of them.

At the ends Thanks “Pakistan Institute of Development Economics”

Sheeba Waheed

Dedication

This thesis is dedicated to my Mother, Teachers, all Friends and my beloved brother Bilal Waheed.

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Abstract

This thesis examines the effects of the uncertainty arising from fiscal policy decisions. In this paper, we empirically examine the effects of uncertainty about fiscal policy on economic activity using Pakistan time series data. To this end, we propose a new measure of fiscal policy uncertainty (FPU). We estimate a fiscal uncertainty through variance in the fiscal stance. This paper uses the change in the structural primary balance (SPB) as a measure of fiscal stance. In order to account for uncertainty, the fiscal stance is based on the annual change in the SPB, which enables it to be compared with the economic projections and estimate SVAR model. SVAR model with fiscal uncertainty shows that an increase in fiscal policy uncertainty has negative, sizable, and prolonged effects on economic activity. Moreover, an unanticipated increase in our FPU measure has adverse effect on the economy in both the short and long term. The empirical evidence suggests that the estimated coefficient of fiscal uncertainty suggests that one % shock in FU decreases output by 6 %. The impulse response function shows that fiscal uncertainty has impact on the lncpi, lnDB, lnTD, lnIR and lnoil in both short and long run except lnER. In addition, our main result is that shocks to lnfu has impact on the lnY both in short and in long run. One policy suggestion based on the empirical finding is clear announcement of future government spending path.

Keywords: Fiscal Policy Uncertainty, Fiscal Stance, Structural Vector Autoregressive and Impulse Response.

Chapter 1:

Introduction

1.1 Background

Pakistan's fiscal year 2019 shows an accelerated decline in the economic environment over the past year. As the statistic from the main economic determinants usually show, that country is in distressed circumstances.[1] Fiscal deficit was recorded at 8.9% in 2019. In terms of quantity, this is the largest deficit ever in our history. The high budget deficit has a direct effect on the amount of the loans. If the inclination consistently increasing then whole economy will crumble as our country cannot endure it. The state require fiscal policy substructure which is diligently plan to affirm that expenditure is in line with objectives and available for financing (Auerbach and Burch, 2014). Uncertainty about fiscal policy, one of several forms of uncertainty, is to blame for the shrinking of the economy and carries additional shrinking risk (Ferreira, 2018). Economists and researchers have debated the uncertainty of fiscal policy for developed, developing and emerging economies in recent decades (Wongi, 2019). The slow-moving betterment, legislative deprivation have sparked the focus of policy makers and researchers for the effect of uncertainty on the macro economy (IMF, 2012). This study focuses specifically on fiscal uncertainty.

Fiscal policy uncertainty is a category of economic threat where the future path of state policy is not sustainable, increasing the risk premium and causing companies and households to delay expending and saving until to the uncertainty is resolved.[2] For

[1] https://www.thenews.com.pk/print/521125-economic-situation-going-from-bad-to-worse
[2] https://en.wikipedia.org/wiki/Policy_uncertainty

example, agents can be unsure about fiscal policy for several reasons; uncertainty about future policy influences agents' anticipations so that observed amendments have real and nominal effects (Mumtaz and Zanetti, 2013). In countries with unsustainable finances, individuals and businesses can expect changes regarding taxation and expenditures, but they may not be sure about the timing and magnitude of these changes. Even in countries where public finances are sustainable, the FPU may be high if the political process is polarized and fiscal frameworks are weak (Kontopoulos and Perotti, 2002, Roubini and Sachs, 1989). In those countries, political uncertainty translates into FPU, because government changes and switches in government coalitions can lead to unpredictable or erratic changes in fiscal policy (Anzuini et. al 2017).

Theoretically, increasing budgetary uncertainty causes firms to wait to invest and hire, and consumers to wait to buy certain consumer goods (Bernanke 1983, Pindyck, 1991). In other words, uncertainty can delay both investment and consumption plans, as there is a real option effect to waiting (Aye et al., 2018). These persistent contractions raise unemployment in uncertain environment therefore slow down economic growth (Bloom 2009; 2014). Another theoretically view of uncertainty is that high uncertainty increases borrowing costs for firms (Christiano et al., 2014). This focus on fiscal uncertainty is taking place against the background of currently projected future fiscal imbalances that, if realized, would require a combination of substantial expenditure and taxation in the coming years. This paper is about the fiscal uncertainty and what to do about it. How to measure and express fiscal uncertainty, what the implications are for the wellbeing of current and future generations. Fiscal certainty is crucial in this respect. While there is great uncertainty about the outlook, reasonable estimates imply an unsustainable fiscal path that will pose

problems if not addressed. Current study focuses on the (FPU) and its effect on economic activities in Pakistan.

1.2 Problem Statement

Presently, Pakistan economy is passing through a critical stage. The major roadblocks to growth in Pakistan seems to be increasing which includes increasing unemployment rate, high inflation, deficits, debt, falling investments and low growth. While deficits and debt ratios have so far been overhead compared to the standards set, forecasts recommend that both numbers will increase in the future. Persistent government deficiency, mounting debt costs will crowd out coming funding, diminish the growth prospect and place burdens on upcoming peer group (Auerbach and Gale, 2017).

During this economic crisis, fiscal stimulus measures emerged as an important universal tool of hope. Tax incentives are normally the government measures related to higher government spending and lower taxes, aimed at providing a positive shock to economic activity (Rustam et. Al 2012). However, fiscal policy decisions are not as easy to make as monetary policy (Stona and Portugal, 2020); due to uncertainty in budget forecasts. The above discussion confirms a strong link between fiscal policy and economics, and any unpredictability in the path of fiscal policy worsens the economic situation. So this paper used to discover the magnitude of such negative consequences of fiscal uncertainty. In this article, an analysis has conducted to find a statistical relationship between uncertainty about fiscal policy and economic activity in Pakistan.

1.3 Research Gap

Given the diverse opinions in this paper, we analyze the fiscal uncertainty and examined the impact of FPU on economic activities in Pakistan. Existing literature was

generally relied on overall fiscal balance to measure fiscal uncertainty. Economic theory suggests that overall fiscal balance is not a good indicator for fiscal policy analysis as it suffers from two major weaknesses. The first and most important is that it does not take into account feedback from the economic activity without change in fiscal policy being able to report to the economy a very contrasting fiscal balance due to cyclical movements. Second, this indicator also fails to incorporate one off events in the fiscal space. We contribute on various fronts. First, we introduce the new measure for analyzing fiscal uncertainty through variance in fiscal stance. Fiscal stance overcomes both the weaknesses of overall fiscal balance and recommended by economic literature on fiscal policy analysis. Second, most of these studies rely on static approaches and do not apply the dynamics of the respective economy. The current study improves existing literature by using structural vector autoregressive model to assess effects of fiscal uncertainty on the economic activity for Pakistan.

1.4 Objectives of the Study

- To estimate fiscal uncertainty in case of Pakistan economic system.

- To examine the economic impacts of fiscal uncertainty on Pakistan's economic outcomes.

1.5 Significance of the Study

This study is beneficial for both government and people of Pakistan. Pakistan's financial position is established by fiscal policy. This study provide a deeper understanding of how macroeconomic variables are affected by fiscal uncertainty using the statistics.

Accurate information regarding determinants make ease for investors and business organizations to proactively manage risk in the face of macroeconomic variations. With this in mind, investors can change their portfolios to reduce risk due to the likely effects that fiscal uncertainty can have on output. A contribution to various users, such as investors, stakeholders, creditors, managers to predict the country's financial health and help them act in accordance with the policy. This study will also help academia understand the role of uncertainties in economy and open up future avenues of research for them.

1.6 Organization of the Study:

The first part of this study presents an introduction; the second part of the study presents some theoretical literature and empirical studies that have already tested the desired objectives. The third part of the study presents trends of fiscal determinants theoretically and graphically, the fourth part attempts to state the data source and methodology of the model, the fifth part presents data analysis and interpretation of results, and the last part shows the closure.

Chapter 2:

Literature Review

2.1 Introduction

In the literature, though several studies focus on the fiscal policy and economic growth but research on the effects of fiscal policy uncertainty are sparse and have not reached consensus yet. Bloom (2009) shows that uncertainty harms economic activity through several channels such as the hold up and see option channel and the precautionary saving motive using the empirical and the theoretical model. The macroeconomic relationship between fiscal uncertainty and economic activities has long fascinated economists. Unfortunately, analyses of that relationship have frustrated empiricists for almost as long. One root of that frustration is the array of possible policy determinants (Fu, et al. 2003). This portion of study is dichotomizing into theoretical and empirical literature. Some prominent researchers work on this relationship is as under;

2.2 Theoretical Literature

A hand at a wide-ranging theoretical literature that studied the effects of fiscal policy on economic activities. In the existing literature the effects of fiscal uncertainty on macro economizing are enlighten in different theoretical frameworks i.e. neoclassical and new Keynesian.

2.2.1 Neoclassical Approach

Hall (1980), Barro (1987), Mankiw (1987) introduced the neoclassical approach and Baxter and King (1993) to examine the effects of fiscal policy shocks on macro economizing. In the neoclassical model, the effects of an expansionary government policy

depend on the process of financing government expenditure. Baxter and King (1993) analyzed the effects of discretionary fiscal policy on macro economizing, assumed lump sum taxes to financed government expenditure. Their results indicated that an expansionary fiscal policy have negative wealth effect on households, they became poorer thus labor supply increased. Given the labor demand constant an increase in labor supply decreased marginal efficiency of labor and real wages, as a result production increased while expending decreased. However, if the shock is continuing private financing would increase because of increase in marginal efficiency of capital, private expenditure would decreased than before and real wages returned to their former level.

2.2.2 The New Keynesian Approach (NK):

The New Keynesian Hypothesis (NK) reviews the equilibrium conditions for a particular general equilibrium model. This approach improves connections between fiscal deficit, inflation and economic growth from the system of two equations, aggregate demand and aggregate supply. This system which better fits to closed economizing is enhanced with a dynamic stochastic general equilibrium framework based on maximization behavior of the agent's, under the market model of imperfect competition. Demand equation is IS function, whereas supply equation is NK version of the Phillips curve. Demand equation is gained on micro preliminary base and influenced by both the output gap and anticipations of real lending rate. Supply equation, and hence Phillips curve is based on profit maximization of the companies, leads to maintain its price temporally. Two equation systems translates general equilibrium model and general model takes it shape with lending rate tool followed by state bank to curb inflation.

The New Keynesian models introduced nominal price rigidities, non-Ricardian behavior, increasing returns and monopolistic competition, claims that an increase in government expenditure has positive impact on private expending and production during multiplier effect. Devereux et al, (1996) introduced a model of market failing, monopolistic competition and an increasing return to scale, found that an increase in government spending enhance demand for goods which in turn enlarged labor demand and real wages. Gali et al, (2007) additional broaden the New Keynesian model, introduced the non-Ricardian "rule of thumb" consumers, whose expending increase in reaction to raise in government spending.

2.2.3 The Fiscal Theory of Price Level (FTPL)

The pivotal theme of the fiscal theory of price level (FTPL) is to maintain the stability of price level in public sector; long-run solvency is needed. This theory interrogates the fiscal policy and monetary policy by inter-temporal budget constraints (GBC). GBC needs to hold balance level between government current nominal value and future primary level of government debt. Government authorities resolved their revenue and primary expenditure exogenously. When primary surplus level is lower than the level of nominal debt, it leads to increase in price level. This shows that fiscal management Wood Ford (1995) explored that significant and exogenous price shock leads to consume rate decrease in actual value positive portfolio financing in public securities affects price level. This concludes negative and insignificant impact of wealth, consequently demand for commodities shrinking. In the light of theoretical words of the FTPL theory, agents, anticipation concerning the sustainability of fiscal policy, can produce the same effect.

2.3 Empirical Literature

To examine the effects of fiscal policy on economic activity the empirical literature includes following sub parts. The first part contains literature related to Pakistan; the second part contains literature related to international studies. Final section based on the methodological literature.

The literature related to Pakistan also gives mix results Government spending, tax revenues and budget deficits as fiscal policy variables have been used by these authors and found different responses of macroeconomic activities to fiscal innovations. Iqbal and Zahid (1998) shocks to government spending positively affect GDP growth rate, whereas shocks to taxes inversely affect GDP growth rate. Additional, GDP growth rate responds negatively to budget deficit in the end. Akram et. Al, (2011) shows that successive governments have tried to reduce the deficit by reducing the development expenditure, which hampered the growth process, resulted in a decline in human development determinants, and increased the incidence of poverty.

Farooq and Yasmin (2017) concluded that the fiscal policy instability because of government expenditures, revenue generations and budget uncertainty negatively affected the economic growth in Pakistan. In addition, the financial development determinants should be promoted being pertinent in rendering high economic growth by offsetting the detrimental effects of fiscal policy uncertainties. Abdul Waheed (2012) finds that uncertainty related to output, current account deficit, budget deficit, external debt, and domestic financing contributes to the volatility of nominal rupee-dollar exchange rate in Pakistan. Fatima and Waheed (2014) indicated that economic policy uncertainty affects negatively on real and nominal sectors of Pakistan. Economic uncertainty not only reduces

the current financing and economic growth, it also affects the future decision of financing and economic growth.

Shaheen and Turner (2008) evaluated the macroeconomic effects of fiscal policy in Pakistan using SVAR methodology for the period 1973 to 2008, by using quarterly data. It employs the recursive approach introduced by Sims (1988) and the Blanchard and Perotti(2002) approach to identify the SVAR model. The estimations through recursive approach suggest a statistically insignificant role of government expenditure socks in explaining the variation in output and inflation. Whereas the results from Blanchard and Perotti (2002) approach reveal a significant role of government expenditure and taxes in explaining the amendments in output and inflation in Pakistan. The empirical evidence suggests that government-spending shocks have positive effect on output and inflation.

Saba et.al, (2015) examined the dynamic effects of fiscal policy shocks in Pakistan by using structural vector auto-regressive (SVAR) model for annual time series data from 1972 to 2014. Four different identification approaches has been used to quantify the effects of fiscal shocks i.e. Recursive approach, Blanchard and Perotti approach, Sign Restriction and Event Study approach for two different lags. Both sets of impulse responses shows that different lag order has no effects on the whole results. The results of both government expenditure and revenue shocks showed that an expansionary fiscal policy increased output only for short and medium term at the cost of high prices and have no significant effects in the end.

To study the dynamic effects of fiscal spending in Pakistan Yasmin and Umaima (2009) used annual data of the fiscal variables government expenditure per capita, expending per capita, real exchange rate, lending rate, taxes and debt to GDP ratio from

1971 to 2008. Followed Favero and Giavazzi (2007) included debt to GDP ratio as a feedback to investigate the responses of fiscal shocks and used the cyclically adjusted primary deficit which was criticized by Shaheen and Turner (2010) because adjusted deficit deliver information only about current policy.

Ansgar et. al (2019) investigated that in contrast to other types of government spending, research and development expenditures reduce uncertainty and have an expansionary effect on output during uncertain times. Ali et.al, (2018) investigated the effect of discretionary government spending volatility on economic growth at the aggregated level for a world representative sample as well as for the samples disaggregated by development level of the nations. Generalized Method of Moment (GMM) methodology is employed for a panel of 55 nations over the period of 1985-2014. The overall results confirm that discretionary spending volatility has a negative effect on economic growth. The impact of discretionary spending volatility is negative and significant at aggregated level of developing economies. However, the association of volatile discretionary public spending with economic growth is negative but insignificant in developed economies.

Blanchard and Perotti (2002) developed a set up to examine fiscal shocks. Fatás and Mihov (2000) analyzed the impacts of government spending on expending and employment. Alesina et al. (2002) estimated the way of government spending shocks on profits and financing. KIM Wongi (2019) and Belianska et. Al, (2018) concluded that an increase in government spending policy uncertainty has negative, sizable, and prolonged effects on GDP, private expending, private financing and the role of financial imperfections in the transmission of these shocks is crucial. James Murray (2017) found the common

component for fiscal plan uncertainty has adverse effects on real GDP, expending, and financing.

Anzuiniet. al (2017) investigated that an unanticipated increase in our FPU measure has an adverse effect on the economizing. It also exhibits 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 FPU. While Goodness C. Aye (2019) has analyzed that high, fiscal plan uncertainty exhibits a negative effect on real GDP while low fiscal uncertainty exhibits a positive effect on real GDP. High volatility (bad news) has larger effect in general than low volatility (good news). Afonso and Sousa (2012) shows that government-spending shocks have a small effect on Gross Domestic Product (GDP). Government revenue shocks generate a mixed effect on housing prices and a small and positive effect on stock prices.

Kevin Kotz´e (2017) show that fiscal volatility shocks produce prolonged shrinking in economic output, expending and financing. In addition, the labor market is also negatively affected, while gross markups and inflation increase. Callegariet. al (2016) proposed a new index measuring the effects of fiscal policy communication on the propagation of government spending shocks. This index is based on the disagreement amongst US professional forecasters about future government spending. The underlying intuition is that a clear fiscal policy communication can coalesce anticipation, reducing disagreement. Results indicate that, in times of low disagreement, the output response to fiscal spending innovations is positive and large, mainly due to private financing response. Ahir et.al (2018) also shows that the level of uncertainty is significantly higher in developing nations and is positively associated with economic policy uncertainty and stock market volatility, and negatively with GDP growth. In a panel vector autoregressive setting,

we find that innovations in the world uncertainty index WUI foreshadow significant declines in output.

Stona and Portugal (2020) build a Two-Agent New Keynesian (TANK) model with stochastic volatility shocks to demonstrate the transmission channels of fiscal policy uncertainty. First, highlights the importance of the labor market on the transmission of uncertainty to households, reinforcing real consequences that uncertainty shocks have on the economizing. Next, shows the shocks can be amplified giving the combination of fraction of hand-to-mouth agents on the economizing and their risk-aversion characteristics. Extending the analysis to a developing country, comparing results for the US and Brazil, shows different results, which is manly driven by the hand-to-mouth agent wealth characteristics. Belianska et.al, (2018) investigated the effects of fiscal uncertainty on financing for the Euro Area by using a stochastic volatility model. New-Keynesian model is build, which enlarged with financial frictions and imperfect substitutability between capital and sovereign bonds. The model is able to replicate the drop in financing observed in the data, unlike a typical New-Keynesian model. It also highlight the role of the monetary policy.

Villaverde et.al, (2011) examined the fiscal policy uncertainty affect on the current economic activity. Estimate tax and spending processes for the US by time-varying volatility. Results find that heightened uncertainty about the future level of taxes has an adverse effect on economic activity. Fowler and Young (2006) analyzed the effect of uncertainty on the optimal size of the government. It shows the variance of technology shocks is larger and the effect is quantitatively small on government. The workers are significantly more risk averse than capitalists, the finding is reversed smaller governments

are associated with larger fluctuations in output. The optimal response of governments to technology shocks leads to aggregate destabilization and countercyclical tax rates.

Davig and Foerster (2013) developed the model for uncertainty by using expiring tax provisions, which is associated with Fiscal Cliffs of the US. The economizing progresses towards a specific date at which a time a change in distortionary tax rates may or may not take effect. This source of uncertainty affects the level of anticipated values of future variables, not simply their variances. As the cliff nears, uncertainty about future tax rates slows financing, expending, and labor. If the cliff is avoided, the economizing experiences a significant rebound in activity, with above average growth for several periods after the resolution of uncertainty.

There are a number of studies, which employ reduced form equations to evaluate the effects of tax policy on output (Eisner, 1989; Romer&Romer, 1994; Perry& Schultz, 1993). Barro (1981) finds that temporary amendments in defense spending have strong positive effect on output. While estimating the fiscal policy effects on activity, endogenity problem can be dealt with by the identification of exogenous fiscal shocks. Ramey and Shapiro (1997) identify three episodes of sharply increased military spending and use these as dummy variables in a univariate autoregressive equation for GDP. Weber (1999) employs a co-integration regression and error correction model to estimate long run and impact multipliers from postwar US data and finds a long run multiplier between 1.1 and 1.4. These estimates are very close to those estimated by Baxter and King (1993).

In the existing empirical literature distinctions in the specification of the VAR models such as; the different set of variables, different sample size, differences among deterministic and stochastic trends of variables, differences in the selection of lag length

and addition of deterministic expressions such as constant, quadratic and linear time trend, and dummy variables were caused different results. As consider the set of different variables, in case of US Blanchard and Perotti (2002) used the three variables VAR from 1947:1-1997:4, while Mountford and Uhlig (2005) used the VAR model of ten variables for the period 1955 to 2000. Ramey and Shapiro (1998), Burnside at al. (2003) and Cavallo (2003) used the large military builds ups as a dummy variable, to investigate the effects of fiscal shocks. Giordano el al, (2008) studied the effects of fiscal policy in Italy distinguished between the wage and non-wage government payments.

As consider the distinctions of stochastic and deterministic terms [Yasmin and Umaima (2009), Giordano el al, (2008) and Favero and Giavazzi (2007)] do not report the existence of co integration, used the unrestricted VAR models instead of VECM. There are also differences in the literature, is the addition of deterministic terms. In case of US, Blanchard and Perotti (2002) included the constant, quadratic time trends, linear time trends, and seasonal dummies while Mountford and Uhlig (2005) do not included any deterministic expressions. Ramey and Shapiro (1998), Burnside at al. (2003) and Cavallo (2003) applied fiscal dummy variable approach, used the deterministic terms i.e. the Vietnam War, Korean War, and the Reagan military build ups, to identified fiscal shocks. Giordano el al, (2008) studied the effects of fiscal policy in Italy included a constant and linear time trends. Finally, consider the selection of the lag length the majority of the earlier literature used six and four lags Mountford and Uhlig (2005) used six lag. Mountford and Uhlig (2005) pointed that the used of high order lags do not affect the whole results.

Blanchard and Perotti (2002) structural VAR approach used to investigate effects of fiscal shocks in US, found that positive government expenditure shocks have a positive

effect on output while positive tax shocks have negative effect on output. Private expending reacts positively to government expenditure shocks as the Keynesian predicts. While both increase in government, expenditure and taxes have a strong negative effect on financing. The identification method introduced by Blanchard and Perotti (2002) has also applied by Perotti (2002) in four OECD nations, de Castro and Hernández (2006) in Spain, Giordano el al, (2008) in Italy and Shaheen and Turner (2010) in Pakistan.

The results of various studies are mixed or even conflicting considerably, mainly due to dissimilarities in methodology or data period. Table 2.1 reports the selected recent studies and their results of empirical relationship between fiscal plan uncertainty and economic growth.

Table 2.1 Comparison of results in selected recent studies

Study	Variables	Methodology	Country	Time Span	Findings
Ateeqa Farooq and bushra Yasmin (2017)	GDP, expenditures, revenues, quasi-money to GDP ratio, credit to private sector, liquid liabilities	Autoregressive distributed lag model	Pakistan	1970-2011	Fiscal policy instability abating economic growth.
Rozina Shaheen And Dr Paul Turner 2008	GDP, inflation, the lending rate, net taxes and government expenditure.	Structural autoregressive model	Pakistan	1973:1-2008:4	Government spending shocks have positive effect on output and inflation.

Samreen saba, Muhammad saqib and Nadeem iqbal (2015)	government spending, (GDP), government tax revenue, Consumer price index and lending rate	Four approaches are used 1- Recursive approach 2- Blanchard and perotti SVAR approach 3- Mountford and uhlig sign restriction approach Ramey and shapiro approach of event study	Pakistan	1972 to 2012.	Both government expenditure and revenue shocks showed that an expansionary fiscal policy increased output only for short and medium term at the cost of high prices and have no significant effects in the end.
Wajid ali and iftikhar ahmed (2020)	GDP , government expenditure and net taxes	Markow switching VAR model	Pakistan	1973-2014 quarterly data	The effect of shocks and the size of multipliers vary across regimes confirming the asymmetric behavior of fiscal policy transmission mechanism.
Muhsin ali, karim khan	GDP , government expenditure, total population, trade	Pooled ols	55 nations	1985-2014 panel data	Volatility in discretionary public spending inversely

and nasir Iqbal (2018)	openness, gross fixed capital formation, human capital, CPI and net taxes				affect the economic growth in the aggregate list of sample nations
Goodness C. Aye (2019)	industrial production index, monetary policy uncertainty (MPU) and fiscal plan uncertainty(FPU)	nonlinear autoregressive distributed lag (NARDL)	U.S	1985M1 to 2017M2.	Monetary and fiscal policy uncertainties significantly affect economic activity in the long run.
Goodness C. Aye (2019)	GDP, company taxes, property taxes, income taxes, expending taxes, government spending, financing, expending expenditure by households, total employment and government taxes	local linear projection (LP) method	South Africa.	1990:Q1 to 2018:Q2	Fiscal plan uncertainty has asymmetric effect on real economic activity.

Nimra and Kashif (2016)	GDP, trade openness, inflation, exchange rate and gross fixed capital formation.	Pooled OLS and Instrumental Variable Least Square methodology	South Asian nations	1990 to 2014.	The study concluded that Automatic stabilizers and discretionary policy are weak in developing economies. Government Should use cyclical policy for macroeconomic stability in developing nations.
Fernandez and Ramırez (2011)	GDP, expending tax, income tax and property tax	Time-varying volatility.	U.S	1970-2010	Heightened uncertainty about the future level of taxes has an adverse effect on economic activity.
Anzuini et.al (2017)	GDP, government borrowing, debt	Time-varying volatility.	Italy	1981-2014	An unanticipated increase in our FPU measure has an adverse effect on the economizing.

2.4 Conclusion

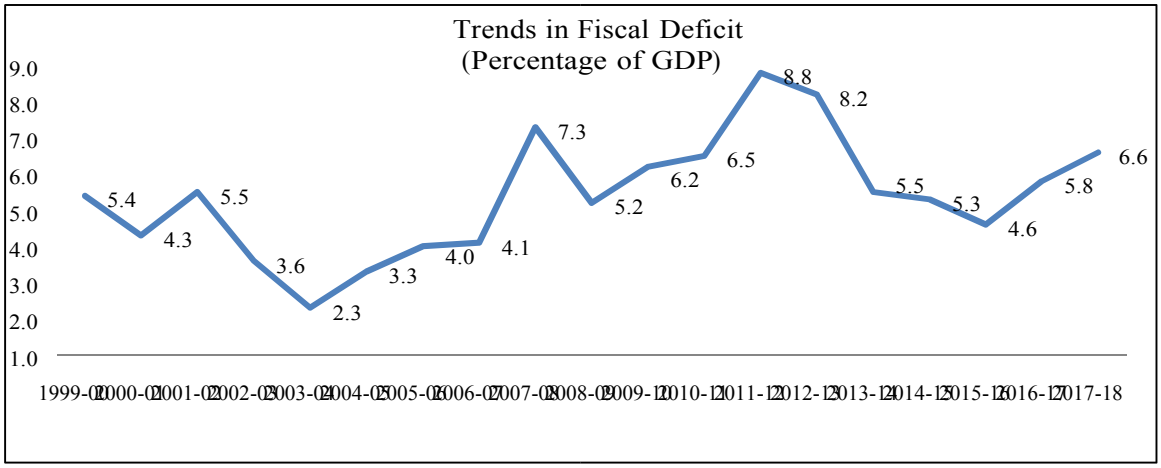
A bird eye view of existing literature on the relationship between fiscal plan uncertainty and economic activities for various nations and for Pakistan shows that there exists mostly positive and significant relationship between fiscal uncertainty and economic growth. Most of studies found that GDP is very much influenced by fiscal uncertainty. However, few studies suggested that fiscal policy shocks has no role in determining economic growth in Pakistan (Rana & Abid). Results may differ due to employment of different estimation techniques. It is however consensus among all researchers that FPU and economic activities has strong relationship. The present study will explore this relationship through SVAR technique for the period 1979 -2019 in Pakistan.

Chapter 3:

Trend Analysis of Fiscal Policy Determinants and Growth in Pakistan

Pakistan's austerity measures have shown mixed trends in fiscal performance over the past few decades. Figure shows the documented movement of tax accomplishment. There were major fiscal imbalances in the 1990s. The country's fiscal performance improved significantly from 2002-03 to 2006-07. After 2006-2007, fiscal outcomes have declined significantly, as the average budget deficit remained around 7 % of GDP in 2008-2013. It was mainly due to lower tax collection, caused in part by slower economic growth, ongoing losses from ailing public companies (PSEs), additional spending from devastating floods, increasing debt service requirements and higher than budgeted declines. Below graph shows the budget position during 2000 to 2018.

Figure 3.1 Trend Analysis of Fiscal Policy Determinants and Growth



Source: Economic Survey of Pakistan & Debt Policy Coordination Office Staff Calculations, Ministry of Finance

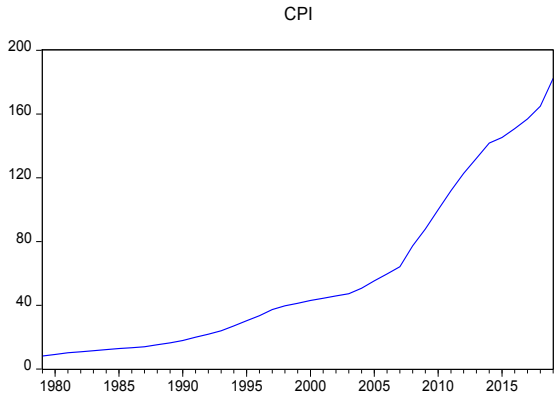
An analysis of the fiscal performance of the past two decades shows that high subsidies remained a major burden on the budgetary accounts, combined with a declining tax-to-GDP ratio. Interestingly, even during the fiscal improvement from 1999 to 2004, the tax ratio continued to decline, implying that the fiscal improvement was achieved solely through expenditure compression. Tax revenue as a percentage of GDP, which averaged 13.7 % in 1992-96, fell to an average of 10.7 % in 2008 to 2018. The low tax-to-GDP ratio has also translated into a declining total income-to-GDP ratio, as it fell from an average of 18 % in 1992-1996 to 14 % in 2008-2018. Over the past two years, an upward trend in the budget deficit has been observed - from 4.6 % of GDP in 2015-16 to 6.6 % in 2017-2018. However, the reasons for the sharp rise in the budget deficit in each of these years were different. In 2016-17, the budget deficit rose in the basis of a strong increase in expenditure, especially provincial expenditure, while in 2017 to 2018 it was a combination of slower revenue growth and a sustained increase in government spending. In the future, both expenditure and revenue measures have important implications for the austerity.

3.1 Fiscal policy uncertainty and economic activity

To analyze the impact of fiscal policy uncertainty in Pakistan, the paper uses annual data; expenditure (G), tax (T), Gross Domestic Product (GDP), Debt Burden (DB), Consumer price index (CPI), Exchange Rate (ER), Trade Dynamics (TD), International Oil Prices (OP) and interest rate (IR) for the period of 1979 to 2019.

3.2 Graphical representation of the Data

Figure 3.2 Consumer Price Index

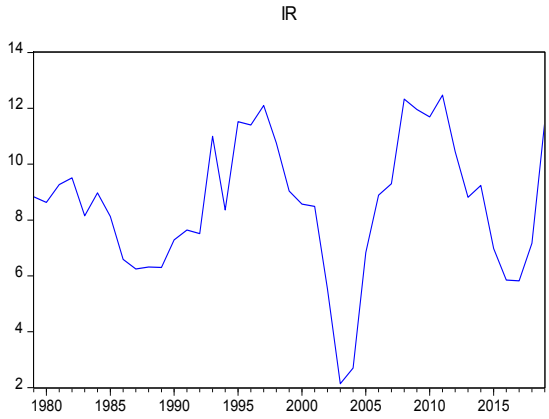


Source: Pakistan Bureau of Statistics

Inflation is another important variable for the fiscal decisions and economic trajectory of Pakistan. With high ratio of imported content in basket of goods for consumer price index, inflation is imperative factor for the decision about the level of taxation and subsidies. Inflation is also considered as key motive behind not allowing exchange rate to take its market value, as the policy makers fear that allowing market based exchange rate could fuel inflationary pressures. Moreover, inflation is also a key factor for the central bank's reaction function for monetary policy. Central bank's decision about monetary policy largely revolves around the level and trajectory of inflation. Adittionalmore, inflation also plays vital role in determining country's trade dynamics. Consumer Price Index calculated on [3]annually basis, according to this data set inflation increased over time from 1979 to 2019. Therefore, in the recent year inflation has rapidly increased for food commodities and for non-food commodities.

[3] Pakistan Bureau of Statistics 2019.

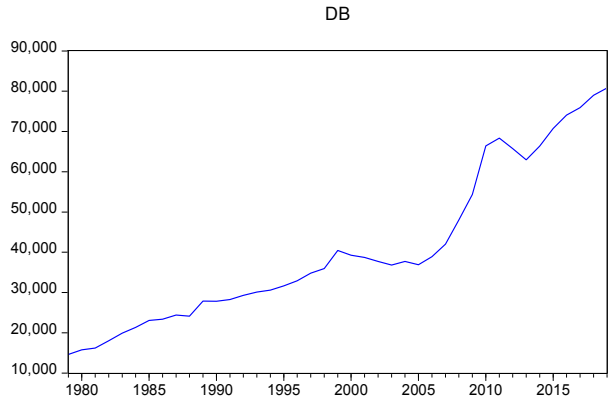
Figure 3.3 Real interest rate



Source: State Bank of Pakistan

As Pakistan is heavily burdened with domestic and external debt, any change in lending rate affects the country's fiscal stance directly. In addition to this direct link, lending rates also plays role through its impact on country's economic activity and its feedback henceforth. Monetary policy considered to be as one of the most prominent sector of macroeconomic arrangement and its positive and averse effect reflect on output. In Pakistan, higher lending rate increases the cost of money (borrowing) for the private sector as well adverse effect on public borrowing and for the private sector that discourage the demand for private sector.

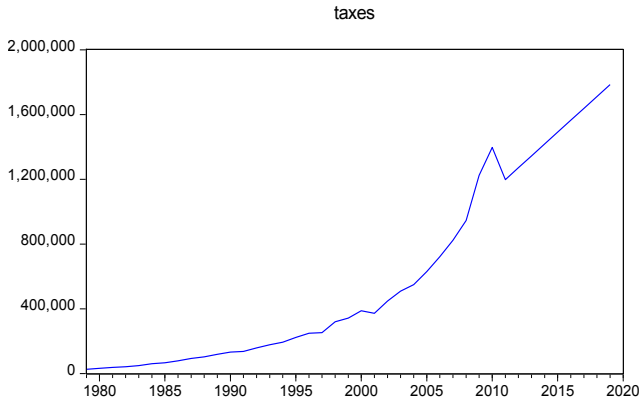
Figure 3.4 Debt Burden



Source: State Bank of Pakistan

Pakistan is one of those nations where running a high fiscal deficit is more of a norm rather an exception. These high fiscal deficits must be financed through raising debt from both domestic as well as external sources. Successive decades of financing high fiscal deficits have put the country in a situation where it must allocate almost 25 % of its total budget for servicing the existing debt. High volumes of debt and annual servicing resulted in putting country in vicious circle of debt and exposed to high rollover risks. As the above chart shows the upward trend that, the country's debt is increasing continuously from 1979 to 2019.

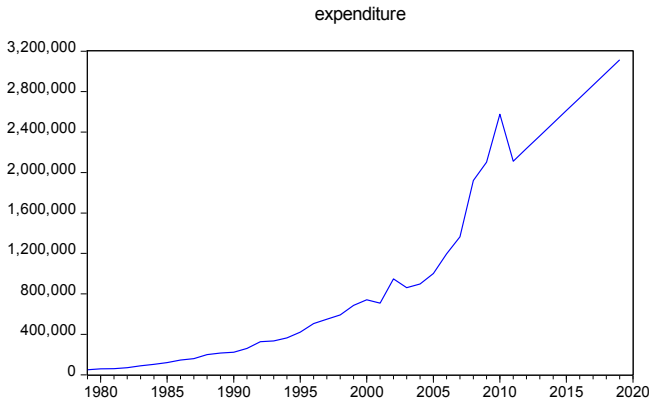
Figure 3.5 Taxes



Source: Finance ministry.

The latest data from finance ministry showed that tax revenues - by federal and provincial authorities - in the last fiscal year 2018/19 amounted to Rs 4,473 trillion, slightly more than Rs 4,467 trillion in the previous fiscal year. The top tax agency Federal Board of Revenue (FBR) collected Rs 3.829 trillion in FY2019 compared to Rs 3.842 trillion in FY2018. However, the collection fell short of the annual target of Rs4.39 trillion, which was revised down from Rs 4.43 trillion. FBR's tax rate fell to 9.93 percent during its last fiscal year from 11.17 percent a year earlier due to poor performance in direct and indirect tax collection. Tax revenue refers to compulsory transfers to the central government for public purposes.

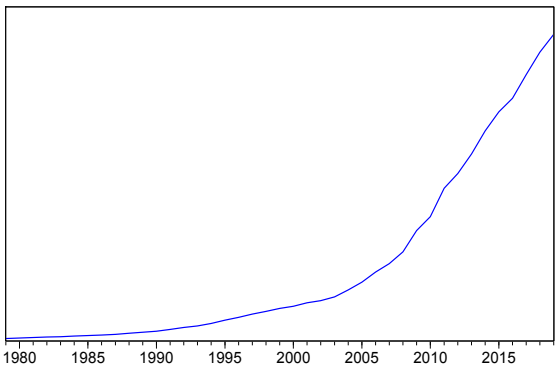
Figure 3.6 Expenditures



Source: Finance ministry.

Government Spending refers to public expenditure on goods and services and is a major component of the GDP. Government spending policies like setting up budget targets, adjusting taxation, increasing public expenditure and public works are very effective tools in influencing economic growth. Fiscal Expenditure in Pakistan increased to 8345.60 PKR Billion in 2019 from 7488.40 PKR Billion in 2018.

Figure 3.7 GDP

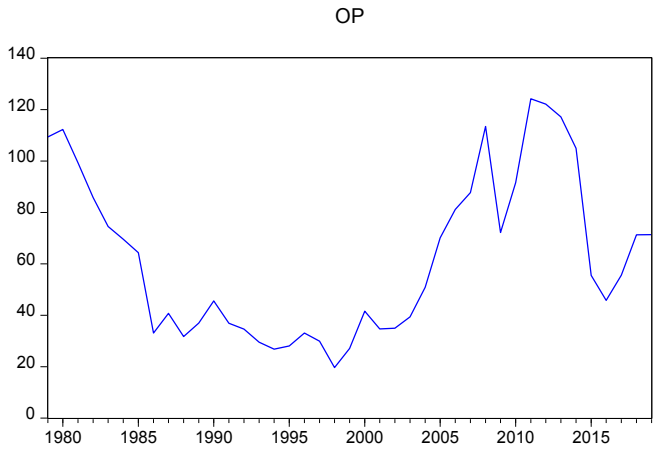


Source: State Bank of Pakistan

Size of economizing have significant part in economic development & nation's fiscal decisions. Mishra and Sharma (2011) highlighted that the size of economizing has a

strong influence on the level of expenditure and revenue base. Upward trajectory of the economizing, if based on improvement in fundamental, leads to better revenue streams for the government and hence improves its fiscal position. Similarly growing economizing can provide more exportable items and can hence improve the country's trade pattern.[4]

Figure 3.8International Oil Prices (OP)

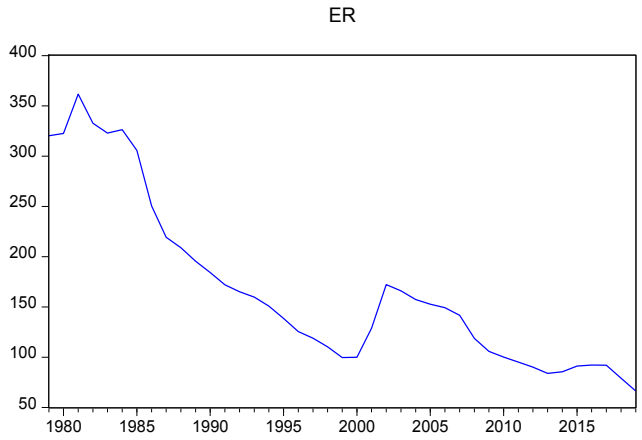


Source: BP Statistical Review of World Energy.

Pakistan is an oil importing country – more than 90 % of domestic oil expending is met through imported oil. Oil imports singularly accounts for 30 % of country's overall imports. Although oil imports of Pakistan are significant for Pakistan's trade and economizing, its share in world oil trade is almost negligible – less than 1 % of global trade. This makes Pakistan a price taker and hence put the country into a situation where it is exposed significantly to external shocks through oil prices. Oil prices play important role, for both Pakistan's economic activity as well as country's fiscal decisions.

[4] State bank of Pakistan (SBP).

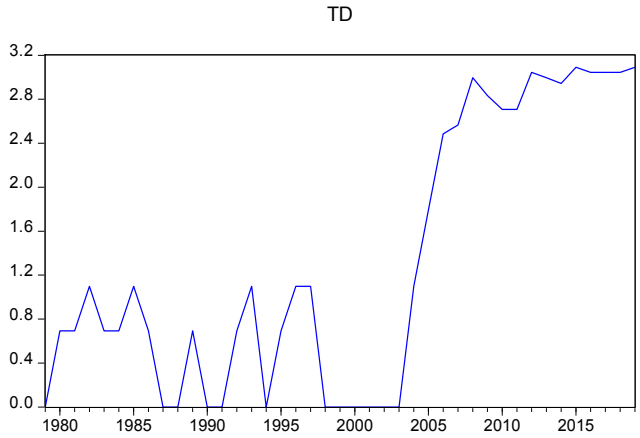
Figure 3.9 Exchange Rate



Source: State Bank of Pakistan.

Pakistan is one of the nations who has almost 50 % of its consumer basked based on imported goods. In this backdrop, exchange rate has a direct impact on country's inflation rate as well as inflation anticipateations. Exchange rate also plays important role in determining burden of debt servicing as large fraction of debt holding of the country is from external sources and denominated in foreign currency.

Figure 3.10Trade Dynamics



Source: Pakistan Bureau of Statistics

Trade dynamics also play important role in determining Pakistan's fiscal decisions as well as overall growth pattern. Pakistan's industry largely depends on imported raw materials and hence are prone to external shocks. Similarly, Pakistan is a country with low purchasing power of common people and has an appetite to subsidize basic goods and services for legislative gains.

As from all above figure, we found that all variables are need to be converted into log form because these involves time trends as well as seasonal effects. Because until and unless we will not make them stationary, we cannot estimate them with time variant of mean and variance of variables. In this connection, we have taken log to make their mean and variance constant over the time.

Chapter 4:

Theoretical model, Data and Methodology

4.1 Introduction

Current study is specific to Pakistan and attempts to include economic variables, which have potential to bring uncertainty in the fiscal policy of the country and to impact economic activity in the country. Inclusion of all potential determinants of economic activity, proxies by GDP, is important as leaving an important variable could lead to omitted variable bias. Study will utilize annual data from 1979 to 2019.

4.2 Data and Variables

In this section, we explain the entire variable that is used to describe the relationship between fiscal policy uncertainty and economic activity in Pakistan.

There are different sources to collect the annual series data starts from 1979 to 2019. The data has been taken from the relevant sources and the variables are macroeconomic variables.

Table 4.1 Data Source

Variable	Source
Inflation rate (CPI)	Pakistan Bureau of Statistics
International oil prices (OP)	BP Statistical Review of World Energy.
Exchange rate (ER)	State Bank of Pakistan.
Trade dynamics (TD)	PBS

Real Lending rate (IR)	SBP
Revenues	Finance ministry.
Gross Domestic Product (GDP)	SBP
Expenditures	Ministry of Finance.
Debt Burden (DB)	SBP

4.3 Theoretical Model

Although reasonable amount of literature is dedicated to gauging effects of tax uncertainty on the economic activity of developed as well as developing nations, most of these studies rely on static approaches and fail to incorporate the dynamics of the respective economy. The equations used in the model is followed by (Shaheen and Turner, 2010; Saba et.al, 2015). Current study improves on the existing literature by using the following structural model to assess effects of tax uncertainty on growth for Pakistan.

$$Oil_t = \beta_{10} + \beta_{14} ir_t + \beta_{18} Y_t + \varepsilon_t^{Oil} \quad (1)$$

$$DB_t = \beta_{20} + \beta_{23} FU_t + \beta_{26} TD_t + \beta_{28} Y_t + \varepsilon_t^{DB} \quad (2)$$

$$FU_t = \beta_{30} + \beta_{31} Oil_t + \beta_{32} DB_t + \beta_{36} TD_t + \beta_{38} Y_t + \varepsilon_t^{FU} \quad (3)$$

$$ir_t = \beta_{40} + \beta_{43} FU_t + \beta_{45} ER_t + \beta_{47} cpi_t + \beta_{48} Y_t + \varepsilon_t^{ir} \quad (4)$$

$$ER_t = \beta_{50} + \beta_{53} FU_t + \beta_{54} ir_t + \beta_{56} TD_t + \varepsilon_t^{ER} \quad (5)$$

$$TD_t = \beta_{60} + \beta_{61} Oil_t + \beta_{63} FU_t + \beta_{64} ir_t + \beta_{65} ER_t + \varepsilon_t^{TD} \quad (6)$$

$$cpi_t = \beta_{70} + \beta_{71} Oil_t + \beta_{73} FU_t + \beta_{74} ir_t + \beta_{75} ER_t + \beta_{78} Y_t + \varepsilon_t^{cpi} \quad (7)$$

$$Y_t = \beta_{80} + \beta_{83} FU_t + \beta_{84} ir_t + \beta_{85} ER_t + \beta_{87} cpi_t + \varepsilon_t^y \quad (8)$$

Equation (1) to (8) explains the structural model used to assess effects of tax uncertainty on Pakistan's economic activity. First equation explains the behavior of import of oil. Equation 2 explains the debt dynamics and advocates that debt burden is the outcome of fiscal performance, trade dynamics of the country and level of economic activity. Equation 3 explains the fiscal uncertainty and highlights that for Pakistan, oil price trends along with debt burden of the country, trade dynamics and level of economic activity are the key determinants of fiscal decisions and the related uncertainties surrounding these decisions. Forth equation is central bank's monetary policy reaction function and explains that while deciding about the lending rates, the central bank considers the fiscal policy, exchange rate movements and the level of economic activity in addition to the key goal of inflation.

Fifth equation explains exchange rate dynamics and explains that exchange rate in Pakistan is largely determined by the fiscal performance of the country, level of prevailing lending rates and trade dynamics. Sixth equation explains trade dynamics that is calculated through import and export numbers and explains that trade dynamics are influenced by oil prices, fiscal certainties, lending rate and economic activity. Seventh equation provides the inflation modeling in the country while the last equation is the most important one and explains the model for economic activity. Theoretical restrictions are already part of the system explained above which is followed by (Blanchard and Quah, 1989). Empirical restrictions have been introduced in the estimation stage.

4.4 Empirical Estimation Methods

Structural Vector Autoregressive (SVAR) model will be used to solve the model. Vector Autoregressive (VAR) analysis is one of the popular time series techniques given its ability to tackle multiple endogenous variables and uncover the anticipated as well as unanticipated relations. However, method faced serious criticism, as it was unable to explain key economic structures existing between variables of interest. To overcome this issue, SVAR approach was introduced which has the capacity to incorporate the economic structure in powerful VAR model.

SVAR has been extensively used in recent years for the analysis of fiscal policy and fluctuations in business cycles. Identification is always a key issue in the estimation of any structural model. To some extent SVAR also suffers from same issue; however these models focus on role of shocks in the dynamic structures to make the right identification. It potentially avoids few inherent difficulties which traditional approaches generally face in identification, but use of SVAR model do have some opportunity cost. It cannot be used for policy simulations, which is very basic output from other dynamic simultaneous equation models. Still SVAR is useful to uncover anticipated as well as unanticipated relations between the variables of interest.

As mentioned earlier, we are using SVAR methodology for assessing effects of tax uncertainty in determining economic activity in Pakistan. Predominantly, VAR discusses the issue that how does a particular shock effect the economizing. However, the identification issue can give the unreliable findings. The econometricians put some extra restriction to identify the VAR models. Therefore, VAR model will serve as a base for the

derivation of Blanchard-Quah SVAR model, which is proposed, and popularize by Blanchard and Quah (1989). The Vector Autoregressive model is:

$$Z_t = B_1 Z_{t-1} + ... + B_p Z_{t-p} + u_t \qquad \textbf{(1)}$$

Equations one to three represents vector auto regression for all observed variables and unobserved, that is "*u"*, white noise. The white noise process advocates for a positive covariance matrix, that is, $E(u_t, u_t') = V$. The *B*'s ,*u*'s and *V* can easily be calculated through OLS. The issue is that the *u*'s are the statistical innovations in the above setting and we want the impulse response functions to the specific fundamental economic shock on an open economizing.

More clearly, the impulse Response Functions (IRFs) shows the response, to an impulse or innovation to concerned variables, of the variables being explained in the setting of VAR model for the following periods. Even the critics of VAR analysis recognize that IRFs are the important outcomes of VAR analysis to study the transmission mechanism of the shock. Keeping the importance in view, we specify the IRFs in which the stationary process is employed

$$Z_t = \lambda_0 u_t + \lambda_1 u_{t-1} + \lambda_2 u_{t-2} + ... \qquad \textbf{(2)}$$

It is obvious that it is a moving average data generating process. In this process, (kxk) identity matix ($I_k = \lambda_o$) and the matrix λ_s are the coefficients of impulse reference functions. These coefficients can be calculated as:

$$\lambda_s = \sum_{j=1}^{s} \lambda_{s-j} B_j \qquad \textbf{(3)}$$

More clearly, the all (i, j) the lemmda coefficient are the anticipated reaction of future value of the endogenous variable of one unit change in the *yjt* keeping all past value of *yt* constant. The innovation *ut* will be computed with *yjt*. Breitung *et al.* (2004) noted that the innovations, that is *ut*, are the impulse response forecast errors.

Let us assume that the components of *ut* are correlated (instantaneously) then the well-known Cholesky decomposition will be employed to the innovations of VAR for the orthogonalization purpose. If we denote the lower triangular matrix by C then the covariance matrix of u is $\sum u = CC'$, and $\varepsilon_t = C^{-1} u_t$ will represent, on the basis of innovation equal to a standard deviation, the orthogolize shock. Resultantly the equation 3 will be

$$Z_t = \theta_0 \varepsilon_t + \theta_1 \varepsilon_{t-1} ..... \qquad \textbf{(4)}$$

Where $\theta_i = B\lambda_i$ and, specifically θ_0 is lower triangle.

However, it is important to note that, the innovation in first variable may transmit instantaneously to all variables of the VAR model but a shock in the second variables will not transmit in instantaneous way on the all other variables.

All eight variables are estimated in VAR model as follow.

$$\begin{bmatrix}\Delta OIL\\ \Delta DB\\ \Delta FU\\ \Delta IR\\ \Delta ER\\ \Delta TD\\ \Delta CPI\\ \Delta Y\end{bmatrix} = \begin{bmatrix}\beta_{10}(l) & \beta_{11}(l) & \beta_{12}(l) & \beta_{13}(l) & \beta_{14}(l) & \beta_{15}(l) & \beta_{16}(l) & \beta_{17}(l)\\ \beta_{20}(l) & \beta_{21}l) & \beta_{22}(l) & \beta_{23}(l) & \beta_{24}(l) & \beta_{25}(l) & \beta_{26}(l) & \beta_{27}(l)\\ \beta_{30}(l) & \beta_{31}l) & \beta_{32}(l) & \beta_{33}(l) & \beta_{34}(l) & \beta_{35}(l) & \beta_{36}(l) & \beta_{37}(l)\\ \beta_{40}(l) & \beta_{41}(l) & \beta_{42}(l) & \beta_{43}(l) & \beta_{44}(l) & \beta_{45}(l) & \beta_{46}(l) & \beta_{47}(l)\\ \beta_{50}(l) & \beta_{51}(l) & \beta_{52}(l) & \beta_{53}(l) & \beta_{54}(l) & \beta_{55}(l) & \beta_{56}(l) & \beta_{57}(l)\\ \beta_{60}(l) & \beta_{61}(l) & \beta_{62}(l) & \beta_{63}(l) & \beta_{64}(l) & \beta_{65}(l) & \beta_{66}(l) & \beta_{67}(l)\\ \beta_{70}(l) & \beta_{71}(l) & \beta_{72}(l) & \beta_{73}(l) & \beta_{74}(l) & \beta_{75}(l) & \beta_{76}(l) & \beta_{77}(l)\\ \beta_{80}(l) & \beta_{81}(l) & \beta_{82}(l) & \beta_{83}(l) & \beta_{84}(l) & \beta_{85}(l) & \beta_{86}(l) & \beta_{87}(l)\end{bmatrix} * \begin{bmatrix}\Delta OIL_{t-1}\\ \Delta DB_{t-1}\\ \Delta FU_{t-1}\\ \Delta IR_{t-1}\\ \Delta ER_{t-1}\\ \Delta TD_{t-1}\\ \Delta CPI_{t-1}\\ \Delta Y_{t-1}\end{bmatrix} + \begin{bmatrix}e_{1t}\\ e_{2t}\\ e_{3t}\\ e_{4t}\\ e_{5t}\\ e_{6t}\\ e_{7t}\\ e_{8t}\end{bmatrix}$$

It is important to mention here that A and B matrices cannot be separately estimated or observed. Therefore, we have to impose some restriction to identify under consideration VAR to recover the equation no 1 and 2. These restrictions could be enforced based on longer run behavior of the economizing and shorter run behavior of the economizing.

Restrictions on matrix A and B are imposed according to the theoretical model.

$$\mathbf{A}=\begin{bmatrix}1 & 0 & 0 & NA & 0 & 0 & 0 & NA\\ 0 & 1 & NA & 0 & 0 & NA & 0 & NA\\ NA & NA & 1 & 0 & 0 & NA & 0 & NA\\ 0 & 0 & NA & 1 & NA & 0 & NA & NA\\ 0 & 0 & NA & NA & 1 & NA & 0 & 0\\ NA & 0 & NA & NA & NA & 1 & 0 & 0\\ NA & 0 & NA & NA & NA & 0 & 1 & NA\\ 0 & 0 & NA & NA & NA & 0 & NA & 1\end{bmatrix}, \mathbf{B}=\begin{bmatrix}NA & 0 & 0 & 0 & 0 & 0 & 0 & 0\\ 0 & NA & 0 & 0 & 0 & 0 & 0 & 0\\ 0 & 0 & NA & 0 & 0 & 0 & 0 & 0\\ 0 & 0 & 0 & NA & 0 & 0 & 0 & 0\\ 0 & 0 & 0 & 0 & NA & 0 & 0 & 0\\ 0 & 0 & 0 & 0 & 0 & NA & 0 & 0\\ 0 & 0 & 0 & 0 & 0 & 0 & NA & 0\\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & NA\end{bmatrix}$$

4.5 Fiscal Uncertainty

General government spending and revenues are highly sensitive to cycles in economic activity. Government revenues (particularly tax revenues) tend to decline during economic downturns, at the same time as public spending may increase given that more people become unemployed and qualify for social assistance or unemployment benefits. On the other hand, during upturns, public finances improve, as tax revenues rise and the number of those receiving social benefits usually declines. These fluctuations in revenue and public expenditure in the absence of any discretionary change in policy make it

difficult to assess whether fiscal policy is expansionary, neutral or restrictive during a given period, and to judge whether fiscal balances are sustainable in the long-run. These factors are considered in the calculation of the government's structural balance, which results from subtracting the aforementioned cyclical effects in the economy, as well as one-off events, from both government expenditures and revenues. The estimated structural balance is best understood the fiscal balance and net lending/borrowing positions, as the contrast helps gauge the differences between short-run and long-term sustainability of public finances. As structural fiscal balances weight the long-term trends more than short-term fluctuations, they can be more easily combined with other macroeconomic projections into the near future.

The structural fiscal balance, framework adjusted for two factors: the state of the economic cycle (as measured by the output gap) and one-off fiscal operations. The structural primary balance adjusted also for the impact of net interest payments on general government liabilities (i.e. interest payments minus interest receipts). The output gap measures the difference between actual and potential GDP, the latter being an estimate of the level of GDP that would prevail if the economy were working at full capacity. One-off factors include both exceptional and irregular fiscal transactions as well as deviations from trend in net capital transfers.[5]

Existing literature has generally relied on overall fiscal balance to measure fiscal uncertainty. Economic theory suggests that overall fiscal balance is not a good indicator for fiscal policy analysis as it suffers from two major weaknesses. First and most important

[5] https://www.oecd-ilibrary.org/governance/government-at-a-glance-2015/general-government-structural-balance_gov_glance-2015-9-en#:~:text=The%20structural%20or%20underlying%20fiscal,cycle%20and%20one%20off%20events.

one is that it fails to incorporate feedback from the economic activity, without change in fiscal policy; economizing can report very contrasting overall fiscal balance due to cyclical movements. Secondly, this indicator also fails to incorporate one off events in the fiscal space. In this study, we will calculate fiscal uncertainty through variance in fiscal stance. Fiscal stance overcomes both the weaknesses of overall fiscal balance and is recommended by economic literature on fiscal policy analysis.

4.6 Measuring Fiscal Uncertainty

Existing literature has generally relied on overall fiscal balance to measure fiscal uncertainty. Ateeqa and Farooq (2017), Shaheen and Turner (2008) and Saba, Saqib and Iqbal (2015) measure fiscal plan uncertainty through volatility of variables (expenditure and revenues) by using GARCH model. Economic theory suggests that overall fiscal balance is not a good indicator for fiscal policy analysis as it suffers from two major weaknesses. First and most important one is that it fails to incorporate feedback from the economic activity, without change in fiscal policy; economizing can report very contrasting overall fiscal balance due to cyclical movements. Secondly, this indicator also fails to incorporate one off events in the fiscal space. In this study, we will calculate fiscal uncertainty through variance in fiscal stance. Fiscal uncertainty is calculated based on paper (Giorno et.al, 1995). Fiscal stance overcomes both the weaknesses of overall fiscal balance and is recommended by economic literature on fiscal policy analysis.

The orientation of fiscal policy is generally captured through the concept of “fiscal stance”. The fiscal stance is routinely measured through the variation of the structural balance. The structural balance is the overall balance of the general government corrected

for the impact of the economic cycle and one-off items.6 We rely on the fiscal stance that is generally calculated as the variation of the structural balance, two variables that are unobservable. Structural balances seek to provide a measure of the fiscal position that is net of the impact of macroeconomic developments on the budget. Essentially, calculation of a cyclically adjusted or structural balance involves an estimation of what revenues and cyclically adjusted expenditure would be if the economizing were at its potential rather than its actual output.

The estimation of structurally adjusted budget balances is, however, subject to considerable measurement uncertainty. The method of structurally adjusting the budget balance applied by the OECD and the European Commission, as this is the official methodology underlying the assessment of fiscal policies in the context of the stability and growth pact (SGP). We focus on measurement uncertainty mainly in relation to the OECD/Commission cyclical adjustment methodology. The aim of this paper is to discuss the importance of measuring uncertainty in the underlying budgetary position and fiscal stance. Interpreted with caution, the structural budget balance can play a useful role in assessing and formulating fiscal policy.7

Structural balances seek to provide a measure of the fiscal position that is net of the impact of macroeconomic developments on the budget. The structural budget balance is an estimation of the responsiveness of other macroeconomic variables, which are directly or indirectly effect revenues and expenditures. The IMF has estimated the structural budget balances and these have been routinely published in the semi-annual World Economic

[6] https://www.europarl.europa.eu/RegData/etudes/IDAN/2016/574424/IPOL_IDA(2016)574424_EN.pdf

[7] For a more thorough treatment of this issue, see Kopits and Symansky (1998).

Outlook.8 The purpose of this note is to describe the methodology underpinning the SBB.9 In this framework, it is possible to quantify both the size of the deviation of actual output from potential and the cyclical sensitivity of public expenditures and revenues to such a deviation, it is technically feasible to estimate the portion of the budget balance that is attributable to relatively favorable or unfavorable economic conditions.10 By subtracting the estimated cyclical component of the budget balance from the observed balance, one obtains an estimate of the SBB. Estimation of the structural budget balance thus involves the estimation of output gap then quantification of the structurally component of expenditures and revenues and subtraction of cyclical expenditures and revenues from their observed levels, which then allows the calculation of the structural budget balance.

4.7 Methodological Considerations

The SBB is founded on the assumption that actual output fluctuates over time around an underlying output path that reflects essentially the long-term potential growth rate of the economizing. This underlying output path, however, is occasionally subjected to both permanent and temporary shocks of varying strength. Permanent shocks (e.g., a significant technological change) have a lasting impact on the path of output. By contrast, the output effects of temporary shocks, by definition, dissipate over time, with successive negative and positive temporary shocks resulting in "cyclical" movements of actual output around potential. [11] In this framework, the

[8] For a number of years, the IMF also produced a measure of the thrust of fiscal policy—the fiscal impulse measure-which was designed to provide an indication of the short run impact of fiscal policy on aggregate demand.

[9] For an earlier and more elaborate derivation of the SBB see, Heller et al. (1986). Also see IMF (1993) and IMF (1995).

[10] If output follows a random walk, neither a deterministic trend nor business cycles can be identified.

[11] See Blanchard and Fischer (1989), Chapter 1.

budgetary effects of a cyclical downturn (upturn), other things being equal, should be self-correcting during the subsequent upturn (downturn). If it is possible to quantify both the size of the deviation of actual output from potential and the cyclical sensitivity of public expenditures and revenues to such a deviation, it is technically feasible to estimate the portion of the budget balance that is attributable to relatively favorable or unfavorable economic conditions.[12] By subtracting the estimated cyclical component of the budget balance from the observed balance, one obtains an estimate of the SBB.

Estimation of the structural budget balance thus involves three steps:

(i) Estimation of potential output and the associated output gap.

(ii) Quantification of the cyclical component of expenditures and revenues.

(iii) Subtraction of cyclical expenditures and revenues from their observed levels, which then allows the calculation of the structural budget balance.

4.8 Estimating Potential Output and Output Gaps

A variety of methods can be used to calculate trend or potential output and a corresponding output gap, but this paper concentrates on smoothing real GDP using a Hodrick-Prescott (HP) filter. As with the split time-trend method, the HP filter is a statistical technique for determining the trend in real GDP, by calculating a weighted moving average of GDP over time. A prominent technique is the Hodrick-Prescott (HP) time-series filtering method, which permits the estimation of a trend line around which the deviations of actual from trend output are symmetric over the

[12] If output follows a random walk, neither a deterministic trend nor business cycles can be identified.

complete business cycle. [13] An alternative method of deriving potential output the principal approach followed at the Fund is the estimation of a production function.[14] Although no standardized methodology is imposed, the production function approach tends to predominate, notably in the case of industrialized nations. For a number of nations, the HP filtering technique is also used to de-trend selected variables.

4.9 Detrending actual output

4.9.1 Split time-trend method

Fiscal determinants has used a split time-trend method to calculate trend output (average output growth) during each cycle, where the cycle is defined as the period between peaks in economic growth[15]. The peaks themselves generally occur where the positive output gap is largest, using the following formula:

$$lnY_t = a_0 + \sum_{i=1}^{n} a_i \, T_i + e_t \qquad \text{----------} \qquad (1)$$

where:

Y_t = real GDP

α_i = trend growth coefficient

T_i = segment of the broken time trend

E = error term

[13] This method is used by the European Commission in the calculation of structural budget balances in the European Union. See European Commission (1995).

[14] For a detailed review of the Fund's approach to the estimation of potential output, see De Masi (1997).

[15] See, for example, Chouraqui *et al*. (1990).

This specification allows estimated trend growth to change between cycles, but not within each cycle. While in theory this method is straightforward, in practice determining where the peaks in the cycle occur is more complicated, using the residuals obtained by regressing GDP on a time trend, in an iterative process: hence the trend determines the peaks, but the peaks also determine the trend. The main advantage of this method is that once the peaks have been identified and the cycle thus defined, output gaps are simple to calculate and are symmetric over each complete cycle.

4.10 Smoothing GDP using a Hodrick-Prescott filter

The GDP smoothing approach using an HP filter fits a trend through all the observations of real GDP, regardless of any structural breaks that might have occurred, by making the regression coefficients themselves vary over time. This is done by finding a trend output that simultaneously minimizes a weighted average of the gap between output and trend output, at any point in time, and the rate of change in trend output at that point in time. More precisely, the trend Y* for t = 1, 2, ...T is estimated to minimize

$$\sum_{t=1}^{T} (InY_t - InY_t^*)^2 + \lambda \sum_{t=2}^{T-1} \left[(InY_{t+1}^* - InY_t^*) - (InY_t^* - InY_{t-1}^*) \right]^2$$

Where λ is the $\sum_{t=1}$ weighting factor that controls how smooth the resulting trend line is. A low value of λ will produce a trend that follows actual output more closely, whereas a high value of λ reduces sensitivity of the trend to short-term fluctuations in actual output and, in the limit, the trend tends to the mean growth rate for the whole estimation

period. For many applications in the literature, λ is set to the specific value originally chosen by Hodrick and Prescott (λ=1600), and which seems to have become a *de facto* "industry standard"[16], although this choice was based on a prior view about the ratio of the variance of the cycle to the variance of the trend (see Hodrick and Prescott 1980), and was also dependent on the data series being adjusted[17].

4.11 Estimating Structural Budget Balances

The overall purpose of adjusting government balances for amendmentsin economic activity is to get a clearer picture of the underlying fiscal situation and to use this as a guide to fiscal policy analysis. The structural budget balance reflects what government revenues and expenditures would be if output was at its potential level and therefore does not reflect cyclical developments in economic activity. In contrast, the actual budget balance does reflect the cyclical component of economic activity and therefore fluctuates around the structural budget balance. In practice, the structural budget balance must be estimated by taking actual government revenues and expenditures and breaking them into an estimated cyclical component and an estimated structural component. More precisely, the structural budget balance measures what the balance of tax revenues less government expenditure would be if actual GDP corresponded to potential GDP. Thus:

$B^* = \sum T_i^* - G^* + \text{capital spending}$

where: B^* = structural budget balance

T_i^* = structural tax revenues for the i^{th} category of tax

[16] . Problems arising from the indiscriminate use of 1600 for GDP and other data series are discussed in Canova (1993).

[17] . Later, Prescott and Kydland (1990) justified their choice of λ as producing a trend that most closely corresponded to the line that students would fit through GDP by hand and eye.

G* = structural government expenditures (excluding capital spending)

In practice, the components of the structural budget balance must be estimated from actual tax revenues (broken into four categories: custom tax, income tax, social security contributions, and indirect taxes) and government expenditures using the property that each component of the budget is adjusted proportionately to the ratio of potential output to actual output, as determined by its elasticity. Thus:

where: T_i = actual tax revenues for the i^{th} category of tax

G = actual government expenditures (excluding capital spending)

Y = level of actual

Output Y* = level of potential

output

α_i = elasticity of i^{th} tax category with respect to output

β = elasticity of current government expenditures with

respect to output

From these relationships, the structural budget balance can be derived as follows:

4.12 Tax elasticities

The OLS have been used in analyzing the model during (1979-2019). The model represents the five macroeconomic variables (GDP and it four components) and its

influence on revenues. The tax revenues are the dependent variable, whereas the five selected variables, which are classified as components of economic growth, are independent variables (GDP, government expenditure, expending, financing and balance of trade). The variables have been taken in log form to compute the values in percentage.

The equation for measuring the elasticity has been specified in the following form. The functional representation of the model is as follows;

$REV = f(GDP, GEX, CONS, INV, BOT)$ ...……. (1)

Where, REV = revenues

GDP= the gross domestic product or the economic growth rate

GEX= government expenditure

CONS = expending

INV= financing

BOT = balance of trade

It can also be presented in a linear form as;

$REV = b_0 + b_1 GEX + b_2 GDP + b_3 CONS + b_4 INV + b_5 BOT + \mu_t$ …..……. (2)

The model has the following results from the regression analysis;

Log (REV) = 0.644 + 0.3393log (GDP) + 0.3072log (GEX) + 0.311log (CONS) + 0.059log (INV) + 2.950log (BOT)

Tax elasticities is calculated based on article (Iriqat and Anabtawi, 2016).

4.13 Expenditure elasticities

Ordinary least squares (OLS) multiple regression method used for empirically analyzing the quantitative effects of economic growth on government expenditure in

Pakistan. OLS estimation was employed because of its peculiar properties and it is a commonly used technique in econometric analysis. These statistical properties include efficiency, minimum variance, consistency and non-biasness. OLS estimators are best linear unbiased estimates. In an attempt to find the relationship between government expenditure and economic growth for the period (1979-2019), the multiple regression analysis was employed in our analysis. The other variables such as lending rate, exchange rate and inflation rate also included in the model. The model states that government expenditure depends on economic growth (GDP), the interest, exchange, and inflation rates. The variables have been taken in long form to compute the values in %ages. The equation for measuring the elasticity has been specified in the following form:

The functional representation of the model is as follows;

GEX =*f* (GDP, INTR, INFR, and EXR) ...……. (1)

Where, GDP= the gross domestic product or the economic growth rate

GEX= government expenditure

INTR= lending rate

INFR= inflation rate

EXR= exchange rate

It can also be presented in a linear form as;

$LogGEX = b_0 + b_1\ logGDP + b_2\ INTR + b_3\ INFR + b_4\ EXR + \mu_t$ …..……. (2)

Where logGDP = log of Gross Domestic product

logGEX = log of government expenditure

b_i s= parameters of the equation to be estimated

μ_t= the error term.

The model has the following results from the regression analysis;

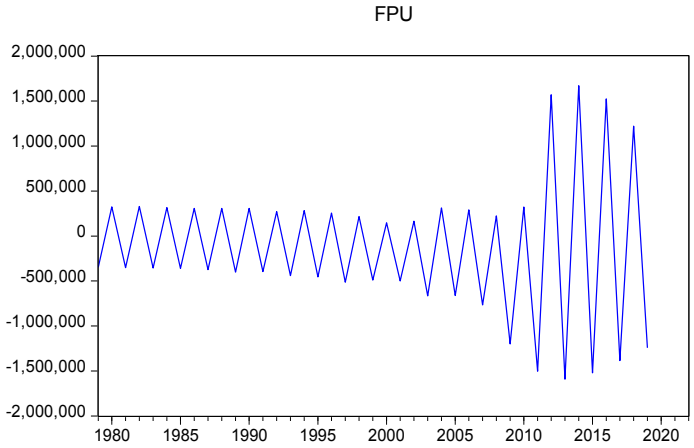
Log (GEX) = 1.25763 + 2.621log (GDP) + 0.0728log (INTR) +3.0496 log (INFR) - 0.3169log (EXR)

Elasticities of expenditure function is estimated based on article (Jelilov and Musa, 2017). The structural series is estimated by the above function of revenues Rst and expenditures Est. The structural budget balance SBB is then obtained by simple subtraction:

SBBt = Rst – Est

Then calculate the variance of SBBt series that shows the deviations from fiscal policy stance. The estimated variance in fiscal stance series represents the fiscal uncertainty.

Figure 4.1 Fiscal Uncertainty



4.14 Impulse Response Function

It is used to find the retort of determinants in given model if a one standard deviation shock come in one variable at a given period. It is also used to find the response of dependent variable when a hand atone standard deviation shock in error term of given Vector Auto-Regression system.

4.15 Stationarity Test

4.15.1 Unit Root Tests for Variables

In this chapter, it is essential to discuss all those technical steps for the empirical analysis, including the existence of stationarity in the series. For this reason inspecting stationarity within dependent and independent variables, the ADF test for each variable is examined to check the presence of a unit root.

4.16 Selection of lags

The next step of the analysis is the selection of optimal lags for the VAR model. Lag order should be selected based on the minimum value and below are the different criteria for the lag structure.

Chapter 5:

Results and Discussion

5.1 Overview of Chapter

This chapter captures the estimation and empirical results of the data series under the framework of Structural Vector-Auto-Regressive technique. The variables are consumer price index (CPI), lending rate (IR), debt burden (DB), fiscal uncertainty (FU), exchange rate (ER), Trade dynamics (TD) and gross domestic product (GDP). As from the previous chapter discussed framework of methodology for data analysis, on the other hand this chapter applies those econometric methodologies to fulfill study's objectives and research questions under consideration.

This chapter contains two sections. First section is about the time series properties of data including summary statistics and stationarity test. Second section explains Structural Vector auto regressive model, it includes model diagnostic tests and impulse response function.

5.2 Descriptive Statistics

The data of macroeconomic variables in this desertion are annually. We have chosen macroeconomic variables because of their importance in macro economizing. On the other hand, we do not promise that the variables we have chosen in this study present complete picture of macroeconomic performance, but their empirical and theoretical importance. Before econometric regression, it is inevitable to check the descriptive statistics of all variables are used for the analysis. Hence, statistical analysis initially depends upon the nature of the data generating process and it is the basic step for research

design, determine, organize raw data for study. Additional, the statistical analysis gives some meaningful information and interpretation for the raw data without taking lags or any other mathematical process.

In a particular way to describe the level of significance, otherwise, using statistical analysis like [18]measure of central tendency including mean, median and mode, [19]measure of dispersion i.e. range and variance. In conclusion, statistical analysis gives rise to clarity about normality in the whole data set, outliers and extreme values, also gives the information about mean, maximum, minimum, standard deviation etc. As long, for the series calculate the kurtosis. Adittional, there are different decades or subsamples for which the standard deviation or stability ratio (coefficient of variation) shows the volatility of variables in each decade. There are different values of the standard deviations and stability ratios and higher value is an indication of higher volatility. The value of [20]Jarque-Bera is not much more and their [21]probability values are less than 0.05 so it concluded that distribution of this variable is not normal when we did not take natural log of our variable. This same interpretation can be done for all variables; however, we need the data normalize. Jarque Bera showed that the data is not normal, in such a case we need to difference all variables to make normal distribution.

Table 5.1 Summary Statistics

	CPI	IR	ER	TD	FU	DB	OP	GDP
Mean	104.280	9.667	31.689	29.200	18794.420	57.972	5892.43	9.477
Median	105.870	9.500	31.300	29.300	12289.030	56.251	5562.750	9.401
Maximum	191.030	15.000	38.060	40.300	50591.570	18.392	11470.970	10.830
Minimum	44.810	6.250	26.940	15.400	1273.060	8.141	1127.200	7.044
Std. Dev.	44.094	2.488	1.976	57.600	14024.990	26.057	2972.672	0.919
Skewness	0.093	0.418	0.763	-0.348	0.679	0.9833	0.140	-0.515
Kurtosis	1.572	2.133	3.511	2.534	2.066	2.6132	1.784	2.676
Jarque-Bera	18.586	13.002	23.181	6.276	24.346	6.8553	13.956	10.449
Probability	0.000	0.002	0.000	0.043	0.000	0.0324	0.001	0.005

5.3 Unit Root Test

Different statistical procedures presented plausible test for the seasonal unit root. In case of having non-stationary series, data and run estimations without knowing or checking the results will be inconsistent, bias or spurious regression.

Table 5.2 Augmented Dickey Fuller Test

Variables	Levels		1st Difference		Order of Int
	Test stat	Critical value (5%)	Test stat	Critical value (5%)	
D(LnCPI)	-0.981	-2.952	-2.948	-2.002	I(1)
D(LnDB)	-0.936	-2.890	-5.938	-4.548	I(1)
D(LnFU)	-0.870	-3.891	-2.938	-1.580	I(1)
D(LnGDP)	-3.631	-4.011	-2.937	-0.108	I(1)
D(LnIR)	-2.598	-5.299	-4.987	-3.656	I(1)
D(LnER)	-2.429	-2.952	-7.543	-4.290	I(1)
D(LnTD)	-2.183	-2.871	-5.903	-5.762	I(1)
D(LnOil)	-0.264	-1.890	-3.868	-1.908	I(1)

T-test statistic calculated values at 5% significance level is less than critical values at level, so I cannot reject the null hypothesis. Then we check all the variables on difference and the t-test value is greater than the critical value, which lead to the rejection of null hypothesis.[22] Therefore, variables become stationary at first difference.

5.4 Lag Length Criteria

We need lags length criteria before estimating VAR model. For this purpose, we have different econometric criteria's including, AIC, SC, HQ, LR and others criteria we followed AIC and LR for the selection of lags, so the results are presented in below table.

[22] Null Hypothesis: series has a unit root

Table 5.3 lag length

Sample = 1979 to 2019

No of obs = 39

Lag	Ll	Lr	p	fpe	Aic	Hqic	SCIC
0	-373.26	0.001	12.448	0.0712	20.061	20.181	20.4100
1	210.815	0.98112*	30.788	027.898	78.9745	10.8098	6.84757
2	90.7897	2.79373	0.001*	6.380*	-0.564*	2.495*	8.0490*

Note: * indicates Minimum Vales of different methods to select Maximum Lags

From the above Table we showed that most of the criteria is suggesting us to select 2 lag as AIC, FPE, HQIC, SCIC and LR. Since, the minimum value of AIC we have selected 2 lag.

5.5 Structural VAR model results

5.5.1 Results for the fiscal uncertainty

In this section we present the analysis of fiscal uncertainty through impulse response function generated through the Blanchard and Quah (1989) SVAR identification.

Table 5.4: SVAR model short run restriction

Log likelihood	100.3598

Estimated A matrix:

1.000000	0.000000	0.000000	0.61718	0.000000	0.000000	0.000000	0.115042
0.000000	1.000000	0.03590	0.000000	0.000000	0.17160	0.000000	-0.66377
0.948498	0.63322	1.000000	0.000000	0.000000	-0.25012	0.000000	0.39043
0.000000	0.000000	0.1429	1.000000	0.954664	0.000000	0.30754	0.441548
0.000000	0.000000	0.01035	0.119431	1.000000	0.06783	0.000000	0.000000
0.100583	0.000000	0.00717	0.9026	0.22419	1.000000	0.000000	0.000000
0.37905	0.000000	0.01101	0.21560	0.93668	0.000000	1.000000	1.37770
0.000000	0.000000	-0.60164	0.037730	0.4250	0.000000	-0.02281	1.000000

Estimated B matrix:

0.254577	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.196497	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	1.712069	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.132411	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.058178	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.085936	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.396985	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.039829

Sources: Process by author

Table 5.5: SVAR model long run restriction

Log likelihood	-382.841						
Estimated A matrix:							
1	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0
0	0	0	0	0	1	0	0
0	0	0	0	0	0	1	0
0	0	0	0	0	0	0	1
Estimated B matrix:							
1.21464	0.213746	-0.03964	1.709022	0.441081	0.218159	-0.23121	0.246928
0.390939	2.0076	-0.00053	0.688989	0.621339	2.229698	-0.21435	0.564815
1.87835	-2.15501	1.277735	1.606274	4.481029	1.028761	1.359021	-11.3956
-0.24316	-0.11831	0.004131	0.301046	-0.11312	-0.98605	-0.16574	0.195781
-0.02678	0.017917	0.008736	-0.15686	0.849476	-0.37106	0.153884	-0.2612
0.140606	-0.12139	-0.02155	0.648641	0.627925	0.929102	-0.0189	0.651195
-0.27198	-0.19086	-0.12015	-0.75621	0.63846	-3.30636	1.102054	5.660108
0.067181	-0.00578	-0.00766	-0.04461	0.161746	0.131514	-0.00522	0.318917

Sources: Process by author

Autoregressive pertains that presence of the lagged values of the dependent variable on the right hand side of the equation and vector means system contains a vector of two or more variables. Therefore, VAR model is constructed only if the variables are integrated of order one. All the variables in a VAR system are endogenous and variables are equal to equations. Equation (1) to (8) explains the structural model used to assess effects of fiscal uncertainty on Pakistan's economic activity. First equation explains the behavior of import of oil. Therefore, start from first equation show that there is positive and significant relation between the interest rate import of oil and economic activity because the analysts look at

past values of interest rate and making the decision of import of oil according to it. When interest rates are low, import of oil ratios expand. Moreover, the prob value which is less than 0.05 shows that the coefficients are significant.

Equation 2 explains the debt dynamics and advocates that debt burden is the outcome of fiscal performance, trade dynamics of the country and level of economic activity. The coefficient of fiscal uncertainty, trade dynamics and gdp shows that there is positive and significant relation between levels of debt. In this case, the estimated coefficient of fiscal uncertainty to total debt is positive and statistically significant**.** A negative and insignificant value of a gdp, debt indicates that increase in debt burden will decrease the output. It suggests that a positive one percent shock increases the total debt level of country by 1.086 percent. Equation 3 explains the fiscal uncertainty and highlights that for Pakistan, oil price trends along with debt burden of the country, trade dynamics and level of economic activity are the key determinants of fiscal decisions and the related uncertainties surrounding these decisions. According to the value of coefficients, there is positive and significant relation between oil prices and fiscal decisions, debt burden and fiscal performance and with economic growth. However, negative coefficient of TD shows that fiscal performance is not effected by the import, export decisions. It means that 1% increase in oil prices effect fiscal performance by 0.948% and increase in the level of debt increases the fiscal uncertainty about 0.633%. Therefore, the economic conditions have more influence on fiscal performance, because the expectations of the investors and households are change. Unstable economy increases the uncertainty factor.

Forth equation is central bank's monetary policy reaction function and explains that while deciding about the interest rates, the central bank considers the fiscal policy,

exchange rate movements and the level of economic activity in addition to the key goal of inflation. FU coefficient also captures a theoretical consistent sign, which implies that a positive shock of FU will increase the interest rate, and there is a crowding out effect and it is statistically significant. A positive value of interest rate and inflation implies a direct relationship between them and this relationship is statistically significant. 1% increase in the cpi will increase the interest rate by 0.307%.

Fifth equation explains exchange rate dynamics and explains that exchange rate in Pakistan is largely determined by the fiscal performance of the country, level of prevailing lending rates and trade dynamics. Sixth equation explains trade dynamics that are calculated through import and export numbers and explains that trade dynamics are influenced by oil prices, fiscal certainties, lending rate and economic activity. Seventh equation provides the inflation modeling in the country the positive coefficient of FU and cpi indicates that a positive shock in FU contributes to high inflation and again it is statistically significant. That is means 1% increase in the fiscal uncertainty level will increase the inflation rate by 0.110%. While the last equation is the most important one and explains the model for economic activity. A negative value of cpi, gdp suggests an inverse relationship between inflation and output. An increase in output reduces the inflation by -0.02% and this relationship is highly significant.

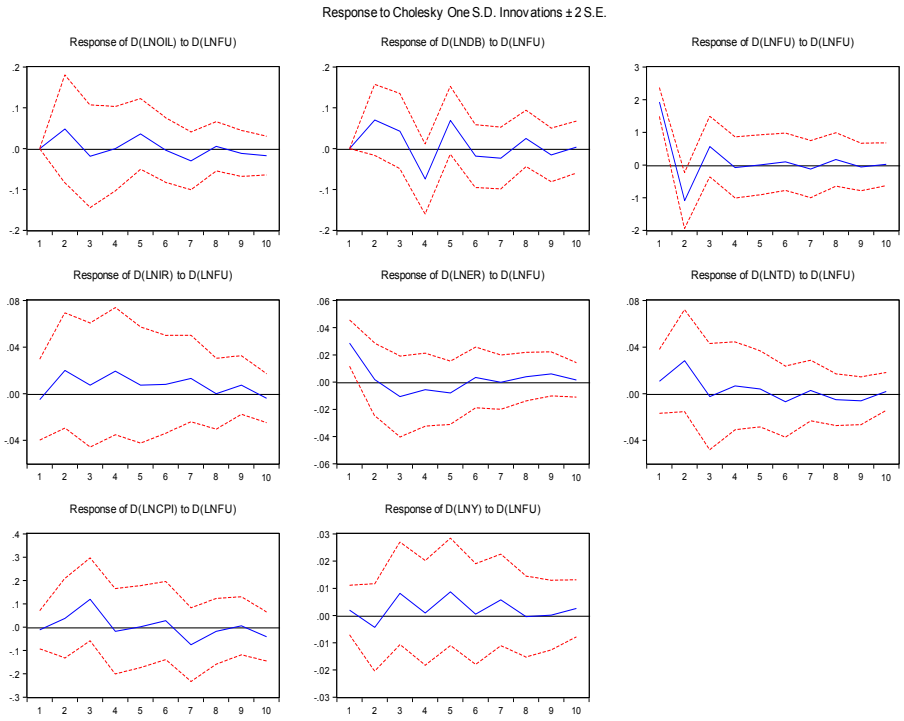
A positive value of interest rate and economic activity augments that an increase in output will lead to higher interest rate and this estimate is theoretical consistent and statistically significant. However, a negative and a statistically insignificant value of fiscal uncertainty and gdp explains that an increasing fiscal uncertainty leads to lower the economic activities and a negative one percent shock in FU decreases output by 6 percent.

Hence, the Blanchard and Parotti (2002) also support the same results negative relation between fiscal uncertainty and economic activity.

5.6 Impulse Response Analysis

To describe the dynamics of the system, the impulse response functions are analyzed. We want the impulse response functions to the specific fundamental economic shock on an open economizing, which explained that how economic cost is bearing in response of fiscal uncertainty in the country. From figure 9, we can see that fiscal uncertainty have impacts on macroeconomic variables. More clearly, the impulse Response Functions (IRFs) shows the response, to an impulse or innovation to concerned variables, of the variables being explained in the setting of VAR model for the following periods. Even the critics of VAR analysis recognize that IRFs are the important outcomes of VAR analysis to study the transmission mechanism of the shock.

Figure 5.1 Impulse Response Function



Note: impulse responses of fiscal uncertainty for lag order two based on Cholesky order. The responses are shown for 10 periods.

Therefore, we have eight graphs the first one is showing the response of oil prices to a one standard deviation shock to fiscal uncertainty. Second, one is showing response of debt burden to a one standard deviation show up to fiscal uncertainty. Third graph is showing the response of fiscal uncertainty, fourth graph shows interest rate, fifth graph exchange rate, sixth graph shows trade dynamics, seventh graph shows inflation rate and last one is the response of gross domestic product. The blue line is impulse response function while the red line are simply the 95% confidence intervals. Therefore, the impulse response function is always lying within the 95% confidence interval.

5.7 Response on oil prices (oil)

A one standard deviation shock (innovation) to fiscal uncertainty has noticeable impact on lnoil from period 1st move upward then from 2nd moves downward. From 3rd to 10th period it gradually increases and decreases. This shows that shocks to lnfu has impact on the lnoil in both short and long run.

5.8 Response on debt burden (DB)

A one standard deviation shock (innovation) to fiscal uncertainty has noticeable impact on lnDB from periods 1 to 10. Initially increases then from 3rd period it diverge and beyond the 4th period, lnDB sharply move upward from its steady state value. This shows that shocks to lnfu has impact on the lnDB both in the short run and in long run.

5.9 Response on interest rate (IR)

A one standard deviation shock (innovation) to fiscal uncertainty initially increases lnIR from negative to positive. This sharply positive response sharply declines at period 3rd until the 4th period when it hits its steady state value and again it moves upward until the 10th period. This shows that shocks to lnfu have asymmetric impacts on lnIR in short as well as in long run.

5.10 Response on exchange rate (ER)

A one standard deviation shock (innovation) to fiscal uncertainty has initially declined lnER to 3rd period. Noticeable impact on lnIR from periods 1st to 5th and then it did not show any recognizable trend because graph is in steady shape. This shows that shocks to lnfu have impacts on lnER only in short but not in LR.

5.11 Response on trade dynamics (TD)

A one standard deviation shock (innovation) to fiscal uncertainty has noticeable impact on lnTD from periods 1st to 8th it is not normal. From 9th to 10th period it shows state position, this shows that shocks to lnfu has impact on the lnTD both in short and long run.

5.12 Response on inflation rate (CPI)

A one standard deviation shock (innovation) to fiscal uncertainty has noticeable impact on lncpi from periods 1st to 2nd moves upward. From the 3rd period, gradually decreases then again increase then move downward until 10th period. This shows that shocks to lnfu has impact on the lncpi in both short and long run.

5.13 Response on gross domestic product (Y)

A one standard deviation shock (innovation) to fiscal uncertainty has noticeable impact on lnY from periods 1st to 10th it is not normal. These continuously upward and downward movements shows that shocks to lnfu has impact on the lnY both in short and in long run.

5.14 Autocorrelation Test

5.14.1 Lagrange-multiplier test

Table 5.6 Autocorrelation Test

Lag	chi2	Df	Prob>Chi2
1	3.461	49	0.626
2	5.155	49	0.154

H0: no autocorrelation at lag order

Table shows that the SVAR serial correlation LM test for normality of residuals. In this connection, the null hypothesis tested is (H0: no serial correlation). So we cannot reject null hypothesis of no serial correlation, on the other hand we accept null hypothesis because probability values are greater than 0.05. From the above table shows that a hand atno problem of autocorrelation because at the 1st and 2nd lag probability value is greater than 5% level of significance and reject the null hypothesis and prove that model is good fitted.

5.15 Normality Test

Jarque-Bera Test

Table 5.7 Normality Test

Equation	chi2	Df	Prob>Chi2
Cpi	5.797	2	0.155
Oil	6.466	2	0.634
DB	12.188	2	0.281
FU	5.469	2	0.164
IR	4.194	2	0.083
ER	1.884	2	0.743
TD	2.989	2	0.172
Y	7.898	2	0.900
ALL	3.987	16	0.306

In the above Table shows Jarque-Bera normality test and we found that probability of all variables is greater than 0.05 including joint probability so we cannot reject the Null hypothesis of normally distributed of residuals. So, it is concluded that residuals are normally distributed So, here from the table shows the normality test we analyze that the errors are normally distributed.

Chapter 6:

Conclusion

In this paper, we are moving in this direction by isolating the uncertainty that arises from a specific source, namely government decisions about the general fiscal stance and measuring its effects on the macro economy. We have proposed a new measure for estimating the FPU effect on the economy by variance in a fiscal stance. This document uses the SVAR methodology for the period 1979-2019, the annual datasets from the State Bank of Pakistan, the Economic Survey of Pakistan and the Ministry of Finance.

Empirical results shows that the estimated coefficient of fiscal uncertainty to total debt is positive and statistically significant fu increases the debt burden of the country by 0.03% and a positive shock of FU will increase the interest rate by 0.14%, and there is a crowding out effect and it is statistically significant. The positive coefficient of FU and cpi indicates that a positive shock in FU contributes to high inflation and again it is statistically significant. That means 1% increase in the fiscal uncertainty level will increase the inflation rate by 0.110%. However, a negative and a statistically insignificant value of fiscal uncertainty and gdp explains that an increasing fiscal uncertainty leads to lower the economic activities and a negative one percent shock in FU decreases output by 6 percent. Hence, the Blanchard and Parotti (2002) also support the same results negative relation between fiscal uncertainty and economic activity.

We want the impulse response functions to the specific fundamental economic shock on an open economy, which explained that how economic cost is bearing in response of fiscal uncertainty in the country. More clearly, the impulse Response Functions (IRFs) shows the response, to an impulse or innovation to concerned variables, of the variables being explained in the setting of VAR model for the following periods. Even the critics of VAR analysis recognize that IRFs are the important outcomes of VAR analysis to study the transmission mechanism of the shock. From the impulse response, function we reach on the conclusion that shocks to lnfu has impact on the lncpi, lnDB, lnTD and lnoil in both short and long run. Moreover, shocks to lnfu have asymmetric impacts on lnIR in short as well as in long run while shocks to lnfu have impacts on lnER only in short but not in LR. In addition, our main result is that shocks to lnfu has impact on the lnY both in short and in long run.

From these results, we infer the main policy conclusions. Fiscal uncertainty reduces economic growth and increases the price level, interest and debt. Because of these uncertainties and low economic growth, companies are hold up to invest and hire, and consumers are hold up to buy goods (Bernanke 1983, Pindyck, 1991). These persistent shrinking are raising unemployment in an uncertain environment due to slowing economic growth (Bloom 2009; 2014). Another theoretical view of uncertainty is that high uncertainty increases financing costs for companies (Christiano et al., 2014). The economy therefore has high inflation, unemployment due to low financings, a high debt ratio on the costs of fiscal uncertainty in the economy in both the short and long term. The results of fiscal uncertainty shocks in Pakistan showed that an expansionary fiscal policy can

stimulate short-term economic activity, but such a policy can diminish long-term economic activity. This should be taken into account by econometricians trying to measure the impact of budgetary consolidations and expansions and by fiscal authorities, which should rely on credible and well-communicated medium term budgetary frameworks in order to avoid large and sudden policy adjustments. We find that when FPU captured by a variance in fiscal stance increases, both GDP and its components decrease. This result highlights that fiscal policy is not just about choosing a deficit level, but it is also about anchoring fiscal anticipations. The same change in the public deficit may have very different macroeconomic consequences, depending on whether the choice of the government increases or decreases the uncertainty surrounding fiscal policy.

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