GOVERNMENT SPENDING SHOCKS AND MACROECONOMIC PERFORMANCE IN PAKISTAN: A NARRATIVE APPROACH

By

Muhammad Mustafa

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Supervisor

Dr Nasir Iqbal

Co-Supervisor: Dr Haider Ali

MPhil Economics

PIDE School of Economics
Pakistan Institute of Development Economics, Islamabad
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PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS

Pakistan Institute of Development Economics, Islamabad

PIDE School of Economics

CERTIFICATE

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Supervisor:	Dr. Nasir Iqbal	Signature:
Co-Supervisor:	Dr. Haider Ali	Signature:
Internal Examiner:	Dr. Saba Anwar	Signature:
External Examiner:	Dr. Faisal Abbas	Signature:
Head, PIDE School of Economics:	Dr. Iftikhar Ahmad	Signature:

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I, Muhammad Mustafa, hereby state that my MPhil thesis titled is Government spending shocks and Macroeconomic performance in Pakistan: A Narrative Approach is my own work and has not been submitted previously by me for taking any degree from Pakistan Institute of Development Economics or anywhere else in the country/world. At any time, if my statement is found to be incorrect, even after my Graduation, the university has the right to withdraw my MPhil degree.

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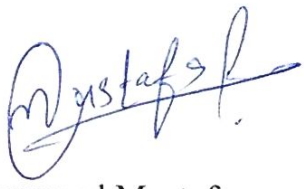
Signature of Student: 

Name of Student: Muhammad Mustafa

Dedication

To the love of my parents, for always supporting me!

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I wish to extend my heartfelt thanks to my supervisor, Dr. Nasir Iqbal, and my co-supervisor Dr. Haider Ali, for their invaluable mentorship throughout this research. Their support has gone far beyond what words can capture. Their guidance helped me navigate the challenges of academic complexities while instilling in me the principles of perseverance, dedication, and intellectual honesty. More than just a remarkably kind mentor, Dr. Haider consistently believed in me—even during times when I struggled to believe in myself.

I am also profoundly grateful to my parents, whose deep respect for wisdom and knowledge has continually guided me in my journey to grow as a scholar. Their teachings on curiosity and the joy of learning have been a constant source of inspiration beyond what words can express.

I want to express my gratitude to all of you for being my support throughout this journey.

ABSTRACT

This study examines how government spending shocks affect output and prices in Pakistan using quarterly and annual data from 1981Q1 to 2023Q4. Government spending shocks are identified through a narrative approach based on Romer & Romer (2010), using official budget documents and economic surveys to determine the size, timing, and motivation of fiscal actions. This method distinguishes between anticipated and unanticipated spending changes, minimizing endogeneity bias. The analysis applies both the Local Projection method (Jorda, 2005) and Structural VAR to estimate impulse responses. Results show that unanticipated spending shocks significantly raise GDP in annual data, while inflation initially falls and then becomes insignificant. Conversely, anticipated spending negatively affects output, with inflation remaining positive but insignificant. At the quarterly level, unanticipated shocks have delayed positive effects on GDP and a temporary rise in inflation, while anticipated shocks mainly increase inflation without influencing output. The findings suggest that unexpected, well-targeted fiscal expansions can effectively boost growth. To reinforce these effects, the government should limit commercial bank borrowing to avoid crowding out private investment. Secondly, Research and development (R&D) spending has declined sharply in recent years. Strengthening support for R&D across both public and private sectors is essential to transform production structures and processes in line with evolving demand patterns, changing consumer preferences, and rapid technological advancements.

Key words: Government spending, Narrative Approach, SVAR

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CHAPTER 1

INTRODUCTION

1.1 Background of study

Fiscal stimulus has been used to stabilize output and prices, but its impact has remained ambiguous. The standard New Keynesian model predicts that expansionary fiscal policy increases the general price level and production. This view is supported by numerous studies (Ferrara, Metelli, Natoli, & Siena, 2021; Zeev & Pappa, 2017). On the other hand, several studies present empirical evidence that real wages and consumption do not increase in response to expansionary fiscal policy (Perotti, 2005) & (D'Alessandro & Fella, 2019). Contrary to the New Keynesian framework, the Neoclassical approach assumes flexible prices with optimizing consumers. According to this approach, when government spending is financed through lump-sum taxes, it negatively affects the household's wealth. This causes a decrease in consumption and an increase in labor hours of the household (Baxter & King, 1993). Both views predict an increase in output either by the channel of growth in aggregate demand or by the increase in labor hours. Moreover, Zubairy (2010) shows that a medium-scale DSGE model with deep habits in both private and public consumption causes inflation to fall and consumption to rise in response to government spending shock.

There are distinct definitions of shock since researchers have termed shock as an innovation or instrument. Sims(1980) explained shock as innovation or unanticipated changes in the errors of a system. Cochrane J.(2004) identified shock as an instrument that exogenously drives macroeconomic fluctuations. Moreover, Romer & Romer (1989) identify shock as an exogenous change in policy. Blanchard & Quah(1988) explained two types of shocks: supply-side shocks that have a permanent effect on output and Demand-side shocks that have temporary effects on output. Furthermore, Bernanke B.(1986) explained that shocks should be primitive, which means that they would not be influenced by other variables within the model; shocks must be independent and economically meaningful. Ramey V. A. (2016) illustrated that shocks should have the following characteristics: Firstly, they should be exogenous disturbances to the system and uncorrelated with both the current and lagged values of other endogenous variables in the model. Secondly, they should be uncorrelated with other exogenous shocks. Lastly, shock should represent unanticipated

movements in exogenous variables or when news about future events causes agents to adjust their behavior before the event.

Identifying shocks accurately is a critical step in empirical macroeconomic analysis, especially when attempting to address the issue of endogeneity within econometric models. Endogeneity arises when an exogenous variable—intended to be independent—is correlated with one or more endogenous variables in the system. This correlation results in biased and inconsistent parameter estimates, ultimately undermining the validity of causal interpretations drawn from the model. Without proper identification of exogenous shocks, any inference regarding cause-and-effect relationships becomes unreliable.

Furthermore, the problem becomes even more complex when a shock of interest is correlated with other exogenous shocks within the model. In such cases, distinguishing the individual effects of each shock becomes difficult, giving rise to what is known as the shock identification problem. When identification is flawed or incomplete, the structural parameters of the model cannot be estimated uniquely, which means the underlying relationships that drive the model's behavior remain ambiguous. This, in turn, significantly limits the ability of the model to provide clear policy recommendations or meaningful insights.

Another major consequence of misidentification is that the impulse response functions (IRFs)—which are used to trace the dynamic effects of shocks on macroeconomic variables over time—will become muddled. If multiple shocks are not properly disentangled, the IRFs may reflect a composite effect rather than the isolated impact of a single structural shock. This overlapping of responses makes it challenging to interpret the outcomes and may lead to incorrect conclusions regarding the transmission mechanisms at work.

To overcome these issues, economists have developed a variety of methods aimed at properly identifying structural shocks in macroeconomic models. Some of the most commonly used techniques include: Cholesky decomposition, Narrative method, DSGE models, sign restriction, Factor-Augmented VARs, Restrictions at Longer Horizons, High-Frequency Identification, and Other Contemporaneous Restrictions.

This study uses the narrative method to identify government spending shocks, following an approach adopted by Romer & Romer (2010), who used the narrative method to examine the effect of tax changes on economic activity. Studies including Hamilton (1985) and Hoover & Perez

(1994) used this approach to identify the oil price shock. Romer & Romer (1989) used the narrative method to identify monetary policy shock using Federal Open Market Committee (FOMC) meeting minutes—Hussain & Liu (2023) Employed narrative approach for the macroeconomic effects of government spending shocks. The change in government spending is due to fiscal consolidation, weak economic conditions, and factors unrelated to policy decisions. Meanwhile, factors that are unrelated to policy decisions and trigger government spending are often correlated with other developments in the economy. Subsequently, this creates difficulty in identifying the exogenous and endogenous changes in government spending, which potentially leads to omitted variable bias. One way to deal with this problem is the narrative records which provide volume, timing, and motivation behind any change in government spending. This study will use narrative records to separate budgetary spending from non-budgetary spending.

Empirical studies have used structural VAR for the identification of shocks. Notably, Blanchard & Perotti (2002) used Structural VAR to identify the dynamic effects of changes in spending and taxes on output. Similarly, this method has been used by several empirical studies (Ravn, Grohé, & Uribe, 2007; Atems, 2019; Jørgensen & Ravn, 2022; Hussain & Liu, 2023). Meanwhile, Blanchard & Perotti, (2002) show that government spending decisions are not affected by current economic conditions. The shock can be identified using a recursive method. When the government spending is ordered first in VAR, it implies that the government spending is uncorrelated with other variables. Ramey & Shapiro (1998) identified spending shocks by focusing on large historical events that prompted this increase in spending. Whereas Ramey (2008) shows that government spending raises real wages and consumption.

Subsequently, empirical studies also carry the local projection method for fiscal policy analysis, see for example Reynolds & Fisher (2025), Rafique, Nisar, & Shah (2024), and Kinda, Lengyel, & Chahande (2022). However, to my knowledge, no study analyzes fiscal policy through Local Projection method.

In the context of Pakistan, certain studies adopted the SVAR model Blanchard & Perotti, (2002) and recursive approach Fatás & Mihov, (2001) for the identification of fiscal policy shocks (Abbas, Aftab, & Ameen, 2018; Padda, Safdar, & Khan, 2022; Shaheen & Turner, 2022; Sharif & Nawaz, 2024). These empirical studies illustrate that government spending significantly impacts output and inflation. Subsequently, Saba, Saqib, & Iqbal (2015) used four methods to identify shock, i.e.

Recursive approach, Blanchard and Perotti, Sign restriction, and the Event study approach. They found that using a recursive approach, government expenditure has a positive effect on output and a negative effect on prices. Whereas, by using Blanchard and Perotti's method, positive government spending escalates production and prices. Moreover, sign restriction results show that an increase in government expenditure does not affect output but has a positive effect on prices for one year, and then the effect becomes negative. While the dummy variable approach showed that output and prices responded negatively. Similarly, Munir & Riaz (2020) found that if the increase in government spending is related to development expenditure, it would increase output and decrease prices, while the increase in CE is positively associated with prices.

Moreover, the macroeconomic impacts of fiscal policy shock in Pakistan have been extensively examined using various methodologies, including Structural VAR along with Cholesky decomposition, sign restrictions, and event-based approaches. Certain limitations of sign restrictions in structural VAR are highlighted by Wolf (2022). Firstly, in sign restriction, the linear combination of other structural shocks is not correctly identified as the shock of interest due to limitations in the identification strategy. Secondly, sign restriction relies on assumed signs but cannot ensure true exogeneity. Evaluating the government spending multiplier with military spending is not useful as highlighted by Barro & Redlick, (2011), it makes it difficult to determine whether the government spending multiplier is greater or smaller than the military spending.

To mitigate the possibility of technique-induced bias and enhance the credibility of empirical findings, this study adopts a multifaceted approach by applying two distinct methodologies to estimate impulse response functions (IRFs). Specifically, we employ both the Structural Vector Autoregression (SVAR) approach, as developed by Blanchard and Perotti (2002), and the Local Projection (LP) method proposed by Jordà (2005). In addition to these two econometric techniques, we incorporate the narrative approach pioneered by Romer and Romer (2010) to identify exogenous government expenditure shocks. This triangulated strategy enables a robust cross-validation of results and reduces reliance on any single method, thereby increasing the reliability and generalizability of the conclusions.

The rationale behind using the SVAR approach, particularly as advocated by Blanchard and Perotti (2002), lies in its theoretical suitability for fiscal policy analysis. They argue that SVAR models are more appropriate for studying fiscal rather than monetary policy, primarily due to the nature of

implementation lags inherent in fiscal measures. Unlike monetary policy, which can often be adjusted quickly through interest rate changes or other instruments, fiscal policy typically involves lengthy administrative and legislative processes. As a result, within a relatively short time horizons such as a single quarter—there is generally minimal discretionary fiscal response to unexpected fluctuations in economic activity. This characteristic reduces the simultaneity problem and allows researchers to treat certain fiscal variables as predetermined within the quarter, facilitating cleaner identification of fiscal shocks. Moreover, Blanchard and Perotti emphasize that many fiscal policy changes are driven by factors unrelated to contemporaneous economic conditions, such as political agendas, long-term planning, or institutional constraints. This aspect further strengthens the case for using SVAR in fiscal studies, as it supports the assumption of exogeneity for certain policy innovations.

Subsequently, the Local Projection method by Jordà (2005) offers a flexible alternative for estimating dynamic responses without imposing strong parametric assumptions on the data-generating process. This is particularly valuable when analyzing responses over various horizons or in the presence of potential nonlinearities. By comparing the IRFs derived from SVAR and LP frameworks, the study is able to test the sensitivity of results to model specification and estimation technique.

1.2 Policy context

Government spending plays a key role in stabilizing output and inflation, and understanding the impact of government spending on output and inflation is crucial for designing effective fiscal policies. Spending stimulating output without triggering inflation can serve a vital role in economic stabilization. The balance between stimulus and fiscal sustainability becomes crucial in a debt-constrained nation like Pakistan. This study will provide a framework for policymakers to specify their focus accordingly.

1.3 Research problem

Based on the narrative of the SoP as stated in the preceding text, I am narrowing my research problem into “Government spending shocks and Macroeconomic performance” and have operationalized my topic into the following research questions and objectives."

1.4 Research question

The research question of this study is as follows:

How do government spending shocks transmit to output and inflation in Pakistan?

1.5 Research objective

The objective of this study is as follows:

To examine the transmission mechanism of government spending shocks on output and inflation in Pakistan's economy.

1.6 Hypothesis

The hypothesis of this study is as follows:

H_0: Government shocks do not affect output and inflation in Pakistan’s economy

CHAPTER 2

LITERATURE REVIEW

The importance of impulses and propagation become important at the beginning of the 20th century for economists to explain business cycle fluctuations. A key question of concern to address was how to explain those fluctuations in which the amplitude of the cycle decreases over time. Slutsky published a paper in 1927 named 'The Summation of Random causes as a source of cyclical process' in which he shows clearly that moving sums of random variables can produce time series that look like the movements of economic time series. The same insight developed by British economist Yule, their insight shifted the focus of research from developing mechanisms to a metronomic view of the business cycle, in which a boom could lead to the next bust and to search for the sources of random shocks.

Mostly fiscal and monetary policy shocks were identified through large-scale econometric models or single equation analysis till 1970. After the introduction of vector autoregressions (VARs) by Sims (1980) in his paper named "Macroeconomic and Reality" in 1980, it changed the direction of research by studying systems driven by random impulses. VAR links the linear system and macroeconomic shocks. Secondly, the Sims method makes it easier to estimate impulse response functions and inquire beyond policy shocks and take non-policy shocks like technological shocks. (Kydland & Prescott, 1982)

2.1 Overview of shock: What is a shock?

There is no clear definition of shock in literature to which we exactly specify that it is a shock. Some researchers used the term shock for innovation, (Sims, 1980) and equated macroeconomic shocks with innovation, despite the claim to be atheoretical, some other researchers also used shock as an instrument (Cochrane, 2004). In the paper of Ramey, shock is said to be the structural disturbances in a simultaneous equation system. Additionally, Ramey adopted the concept of shocks used by many researchers such as (Blanchard & Watson, 1986, and Stock and Watson). According to (Bernanke, 1986) shocks would be uncorrelated with each other, exogenous, and could be economically meaningful.

Shocks should have the following characteristics: (1) shocks should be uncorrelated with current and lag endogenous variables in the model, (2) they should also be uncorrelated with other exogenous shocks otherwise then the unique causal effects of one exogenous shock relative to another and (3) they should reflect either unexpected movements or information about future movements in exogenous variables.

2.2 Identification Method

Some of the common methods for shock identification will be discussed in the preceding section, which includes Cholesky decomposition introduced by Sims (1980), other Contemporaneous Restrictions introduced by Blanchard & Watson (1986) and Bernanke (1986), Narrative methods, and some other methods to identify shocks.

2.2.1 Cholesky Decompositions

Cholesky decomposition was introduced by Sims (1980), and it is the most common method used for the identification of shocks in macroeconomics. And imposes a set of recursive zero restrictions on contemporaneous coefficient. This method is also known as triangularization. There are two alternative ways to use this method. In the first method, the policy variable does not respond to another endogenous variable. For instance, Blanchard, O., & Perotti, R. (2002) assume that government spending does not respond to contemporaneous output and taxes while imposing constraints for the identification of shock to government spending. In the second alternative way, other endogenous variables do not respond to policy shock within the period. Bernanke & Blinder (1992) were the first to use this method to identify monetary policy shocks.

2.2.2 Other Contemporaneous Restriction

A more general approach that also nests Cholesky decomposition in its framework is the structural VAR or SVAR methodology, introduced by (Blanchard & Watson, 1986) and (Bernanke, 1986). This method either uses economic theory or external estimates to impose constraints on the model's parameters.

2.2.3 Narrative Method

This method is used to identify the reason for or change in the volume of a variable from historical policy documents. Narrative methods are used to identify policy shocks. Some researchers used

this method for the identification of policy shocks; for instance (Friedman & Schwartz, 1963) are the classical example of using historical policy information to identify shocks.

It Is Important to note the potential limitations of narrative series In Identifying shocks exogenous shocks. An example in fiscal literature is if fiscal consolidations are implemented in response to a negative expectation about future growth. In this case, fiscal consolidations are partly a reaction to anticipated economic conditions.

2.2.4 High-Frequency Identification

(Bagliano & Favero , 1999), (Kuttner, 2001), (Cochrane & Piazzesi, 2002), (Piazzesi & Swanson, 2008), (Nakamura & Steinsson, 2015)used high-frequency data like news announcements around fiscal policy meetings and fluctuations in government spending to identify unexpected federal policy actions, which identify strategies relying partly on timing, these assumptions are more credible due to the high-frequency nature of the data (daily or higher) than those employed monthly or quarterly.

2.2.5 External Instruments

The external instruments are also known as "proxy VAR," which nests external series for identification. This was first introduced by Stock and Watson (2008) and then extended by (Stock & Watson, 2012) and (Mertens & Ravn, 2013). This approach identifies economic shocks developed from outside VAR. It refers to data derived from narrative evidence, shocks estimated from DSGE, or high-frequency data. These external data series are used as noisy measures for true underlying shocks.

2.2.6 Restriction at Longer Horizons

As clear from the name of the method, one can use this method to identify a shock by imposing long-run restrictions. This method was first used by (Shapiro & Watson, 1988), (Blanchard & Quah, 1988) and (King, Plosser, Stock, & Watson, 1991)

2.2.7 Sign Restriction

Another identification method is sign restriction. Many authors faced a common issue in the analysis of VAR models: circular reasoning while evaluating the validity of VAR specification or identification method. It points out that the validity is often based on whether the resulting impulse responses are aligned with prior expectations. This can be used in different contexts, such as

monetary, fiscal, and technological shocks. Work by (Faust, 1998) and (Uhlig, 2005) Used sign restrictions for the identification of shocks. Certain limitations of sign-restriction in structural VAR are highlighted by (Wolf, 2022), first, in sign-restriction, the linear combination of other structural shocks is not correctly identified as the shock of interest due to limitations in identification strategy. Second, the most commonly used Haar prior tends to give more weightage to those shocks with high volatility, as a result, the posterior distribution is heavily influenced by the relative volatilities of shocks, which is a feature of shocks that have nothing to do with their dynamic causal effects.

2.2.8 Factor-Augmented VARs

A continuous concern related to identifying shocks in VAR is that it does not capture all the relevant information about the variables. To overcome this issue more adequately, (Bernanke, Boivin, & Eliasz, 2005) developed the FAVARs on earlier dynamic factor models developed by (Stock & Watson, Forecasting Using Principal Components From a Large Number of Predictors, 2002) and others. The benefit of FAVARs is that it captures all the relevant information for identifying shocks, mostly it relies on Cholesky decomposition.

2.2.9 DSGE Models

Dynamic stochastic general equilibrium (DSGE) was introduced by (Smets & Wouters, 2003). It is a contemporary approach used for identification. Through this method, shocks can be estimated in full form from a complete model. Some types of shocks are estimated, such as monetary policy shock, fiscal policy shock, technological shock, and risk premium shock. Then we create an impulse response function from the estimated shocks. Researchers used this method includes (Justiniano, Primiceri, & Tambalotti, 2010) and (Schmitt-Grohé & Uribe, 2012). Work by (Canova & Sala, 2009), (Komunjer & Ng, 2011) and many others highlighted potential issues with identification in DSGE model.This method achieve identification by imposing theoritical assumption about the relationships of the variables, now certain theoritical frameworks can explain the same data, identification may become ambigous and less starightforward in these types of models.

2.3 Related literature

2.3.1 Conceptual background

The concept of government spending shocks and inflation has received a large attention in theoretical literature on how government spending shocks affect the macroeconomic activities of an economy. Different theories are related to the topic of government spending and macroeconomy relations, The New Keynesian framework treats the expansionary fiscal policy as an exogenous increase in aggregate demand. This increase in the short run allows firms to sell more output, which will increase the income, boost jobs, and enhance consumption. As the Keynesian phenomenon is short run, prices are sticky; that's why demand plays a dominant role in shaping prices. Overtime, firms adjust prices mainly due to cost push inflation from increasing wages. Consumers in the Keynesian model are assumed to be non-Ricardian, so that their consumption depends on the current level of disposable income.

Contrary to the New Keynesian framework, how government spending affect output, labor hours and also whether fiscal packages makes sense, we have Neo classical approach which assumes flexible prices with optimizing consumers, views fiscal policy, that government spending when funded by taxes cause negative wealth and the households are infinitely-lived Ricardian households consumptions decisions are guided by their intertemporal budget constraint at any given moment, which will decrease private consumption and increase in labor supply and in turn employment and output will rise with lowering wage. (Baxter & King, 1993)

Studies show how consumption rises with the increase in government spending which is aligned with Satndard new Keynesian model, however (Galí, Salido, & Vallés, 2007) extend the new Keynesian model with the innovation of rule of thumb consumers and show the interaction between sticky prices and deficit financing and off the curve labor supply, only these assumptions can explain how consumption rises with the increase in government spending.

2.3.2 Previous studies

Table 2.1: Overview of literature

Authors	Methodology	Findings
Hussain & Liu (2023)	Structural VAR Narrative approach	Spending increase in Canada decrease consumption through narrative approach and the same results are obtained through SVAR analysis.
Atems (2019)	Panel SVAR	Government spending raises output, real wages and employment
Jørgensen & Ravn (2022)	SVAR Cholesky decomposition	Contrast to New Keynesian model that prices vary with spending shocks, this paper empirically shows that prices response is flat or even negative, prices coincide with increase in output, consumption and TFP.
Ramey (2009)	Standard VAR	This paper highlights the effect of government spending on consumption and real wage; standard VAR identifies a rise in consumption and real wage.
Blanchard & Perotti (1999)	Mixed structural VAR	A positive government shock results in positive effect on output and a positive tax shock results in negative output, while both increase in spending and taxes have adverse effects on investment spending.
Zubairy (2010)	VAR	After incorporating the events that show significant changes in military spending, this study demonstrates that in response to unanticipated government spending shock increase in output, consumption and wage while inflation, investment and the nominal interest rate decline upon the impact.
Magda Kandil	Time series analysis	Investigate annual data for cross country analysis of government spending shocks. Results show that changes in government spending shocks decrease real output growth while increasing price inflation across countries.
Ravn, Grohé, & Uribe (2007)	SVAR	A positive change in government spending led to an increase in output and consumption but affected real exchange rate and trade balance negatively.

Burnside, Eichenbaum & Fisher, (2003)	Narrative approach	Investigate the response of labor hours and real wages to fiscal policy shocks for the US during the post-World War II era. This paper is built on two versions of the neo classical model, the first is named as benchmark model and the second one is named as modified benchmark model. The qualitative effects of rise in government spending on wage and labor hours with the rise in tax rate increase hours and reduce in real wage, investment will rise and consumption falls.
Olaoye, Okorie, Eluwole, & Fawwad (2020)	GMM	Economic growth responds differently with the nature of shocks on them, and there is asymmetry in government spending and economic growth.
Romer & Romer (2010)	Narrative approach	Separated the legislative changes in tax taken in response to economic conditions from those taken more exogenously and found that tax increase is highly contractionary, and the effect of tax change is significant and robust.
Karel Mertens and Morten Ravn	VAR	Distinguish the anticipated and unanticipated tax changes using the timing convention. The study's main findings were that an unanticipated tax cut raises output, consumption, and investment. Furthermore, unanticipated and anticipated shocks have also contributed to the US business cycle.
Rafique, Nisar, & Shah (2024)	Local Projection	Estimates the fiscal multipliers in 107 developing countries over the medium term. The finding of the study reveals that fiscal multipliers are more effective in recessionary periods than in expansionary periods, as they stimulate output growth.
Reynolds & Fisher (2025)	Local Projection	Government investment spending crowds out private sector activity on average when the economy is in low low-unemployment state, and government has a small stimulative effect in private sector activity in the high-unemployment state.
Kinda, Lengyel, & Chahande (2022)	Local Projection	Expansionary fiscal policy has a large and significant effect on output. Fiscal multipliers are more effective in the immediate years of crisis.

2.3.3 Literature related to Pakistan

The influence of government spending shocks on the macroeconomy in Pakistan has much literature. The most recent study by (Munir & Riaz, 2020) on Exogenous shocks of fiscal policy and its effects on the macroeconomy of Pakistan showed that if the increase in government

spending was related to development expenditure it would increase real GDP and will decrease prices, while the increase in CE mostly in subsidies and defense spending are positively related with prices and negatively related with increase in expenditure of social services. The study employed structural VAR with a period from 1976 to 2018.

Another study (Javid & Arif, 2009) using VAR methodology estimates the dynamic effects of government spending on Pakistan's macroeconomics. This study finds a negative response to output and consumption with changes in government spending; the real exchange rate tends to appreciate, and the risk of inflation rises.

Subsequently, Saba, Saqib, & Iqbal (2015) used four methods to identify shock i.e. Recursive approach, Blanchard and Perotti, Sign restriction, and Event study approach. They found that using a recursive approach, government expenditure has a positive effect on output and a negative effect on prices. Whereas, by using Blanchard and Perotti's method, positive government spending escalates production and prices. Moreover, Sign restriction results show that an increase in government expenditure does not affect output but positively affects prices for one year and then the effect becomes negative. At the same time, the dummy variable approach showed that output and prices responded negatively.

2.4 Contextual Background

As there is no explicit fiscal discipline in Pakistan but most of the fiscal policy and regulatory framework are based on constitutional requirements, legislative instruments, and institutional mechanisms designed to balance macroeconomic stability with developmental priorities. The framework reflects a complex interplay of federal-provincial dynamics, fiscal discipline priorities, and socio-political challenges.

2.4.1 Constitutional Foundations

The 1973 Constitution of Pakistan establishes the legal bedrock for fiscal governance. Key provisions include:

2.4.2 Articles 73 and 80

Mandate parliamentary approval for all expenditures, ensuring legislative oversight over budgetary allocations.

2.4.3 Article 160

Institutionalizes the National Finance Commission (NFC), which determines vertical (federal-to-provincial) and horizontal (inter-provincial) revenue distribution through periodic NFC Awards.

2.4.4 18th Amendment (2010)

Decentralized fiscal authority by devolving key responsibilities (e.g., health, education) to provinces, reshaping intergovernmental fiscal relations.

2.5 Legislative Frameworks

2.5.1 Fiscal Responsibility and Debt Limitation (FRDL) Act (2005, amended 2016)

Defines fiscal discipline by capping the fiscal deficit at 3% of GDP and public debt at 60% of GDP.

2.5.2 Public Procurement Regulatory Authority (PPRA) Ordinance (2002):

Governs procurement processes to ensure transparency, competition, and value-for-money in public contracts.

CHAPTER 3

DATA AND METHODOLOGY

This section provides a brief overview of government spending in Pakistan, along with a concise summary of the narrative approach and the process of compiling data on government expenditures from 1981 to 2023. This data is then utilized in both Structural Vector Autoregression (SVAR) and Local Projection models. The results from these two approaches were then compared to minimize potential technique-specific biases and ensure the robustness of the findings.

3.1 Variables and Data Sources

The variables for this study are government spending, Output, and inflation, spanning the period from 1981Q1 to 2023Q4. The secondary data sources are Budget in Brief, the Ministry of Finance, International Financial Statistics, and the State Bank of Pakistan.The Chow & Lin (1971) method is used for quarterizing real GDP and Government spending, which are recorded on annual basis.The process of converting data from a lower time frequency to a higher one, known as temporal disaggregation, has been addressed in the time series literature by several researchers, including Boot et al. (1967), Chow and Lin (1971), Harvey and Chung (2002), Litterman (1983), and Moauro and Savio (2005). Boot et al. (1967) developed a method for transforming low-frequency data into high-frequency series using ARIMA models and a state-space framework, where the time series properties of the data are leveraged for disaggregation. Their approach builds upon the earlier work of Lisman and Sandee (1964).

Lisman and Sandee (1964) proposed that if no specific assumptions are imposed on the structure of quarterly data, then a smooth trend can be generated. Their method is based on a straightforward principle: the sum of the quarterly values must equal the annual total. In this approach, the quarterly figures are derived as weighted averages of the annual data. The key advantage of this technique lies in its simplicity and ease of implementation.

Table 3.1 Data description

Variables	Definition	Source
Government Spending	Federal government expenditure both current and development expenditure	Budget in Brief
GDP	During a specified period, often one year, encompassing the total value of all goods and services produced within national borders.	State Bank of Pakistan
Inflation rate	An indicator of inflation is the variation in the average prices of a collection of goods and services, quantified by the consumer price index (CPI).	International Financial statistics

3.2 Narrative analysis

This study will use the narrative method to identify government spending shocks, following an approach adopted by Romer & Romer (2010), who used the narrative method to examine the effect of tax changes on economic activity. The change in government spending is due to fiscal consolidation, weak economic conditions, and factors unrelated to policy decisions. Meanwhile, factors that are unrelated to policy decisions and trigger government spending are often correlated with other developments in the economy. Subsequently, this creates difficulty in identifying the exogenous and endogenous changes in government spending, which potentially leads to omitted variable bias. One way to deal with this problem is the narrative records, which provide volume, timing, and motivation behind any change in government spending. This study will use narrative records to separate budgetary spending from non-budgetary spending. Studies including Hamilton (1985) and Hoover & Perez (1994) used this approach to identify the oil price shock. Romer & Romer (1989) used the narrative method to identify monetary policy shock using Federal Open

Market Committee (FOMC) meeting minutes. Hussain & Liu (2023) employed narrative approach for the macroeconomic effects of government spending shocks.

3.3 Identification of government spending changes

This study adopts the methodology of Romer & Romer, (2010) to differentiate government spending changes as exogenous or endogenous. Exogenous changes are independent of current economic conditions, while, endogenous changes take place in response to prevailing fiscal or economic trends. This study classifies exogenous government spending into different categories: firstly, Military spending; secondly, subsidies in response to natural disasters; thirdly, export and import subsidies for long-run growth; and lastly, Public sector development program (PSDP) budget investment. The consideration of non-defense spending is also crucial, as highlighted by Barro & Redlick (2011), when we want to estimate government spending multiplier by examining the impact of various government spending with military war dates is not necessarily useful. It is hard to determine whether the total government spending multiplier should be larger or smaller than the military spending multiplier. Since military spending is often temporary and may have smaller multipliers and some non-defense programs can also be short term.

3.4 Data on Government Spending

Data on government spending shocks are collected using the narrative approach, drawing on various government reports, including the Budget in Brief, economic surveys, and annual budget reports, to identify the size, timing, and principal motivation for all major increases in government spending.

3.4.1 Budget 1982-83

There was a notable 23.2% increase in current expenditure (CE), which rose from Rs 48,511.4 million to Rs 50,949.6 million, as reported in the Economic Survey 1982-83. A significant portion of this expenditure was allocated to defense, with the defense budget initially estimated at Rs 22,095 million. However, the revised budget increased to Rs 23,323 million, a considerable rise compared to Rs 19,592 million allocated in the 1981–82 fiscal year. This upward adjustment in defense spending was largely influenced by heightened regional tensions and increased security concerns stemming from the geopolitical situation in neighboring countries, necessitating greater allocation toward national defense and military preparedness.

3.4.2 Budget 1984-85

For the fiscal year 1984–85, the proposed current expenditure (CE) was set at Rs 64,242.5 million. However, the revised estimate saw a substantial increase, reaching Rs 70,763.3 million. This significant rise was primarily attributed to a sharp increase in subsidies, which more than doubled from Rs 2,617.9 million to Rs 5,324.7 million. The surge in subsidy expenditure was largely due to the rising global prices of imported edible oil and wheat. To ensure stable and sufficient domestic supplies, the federal government provided these essential commodities to provincial governments at prices lower than their imported cost, thereby absorbing the financial burden through subsidies.

In addition to this, the government exercised its authority under the Price Control and Prevention of Profiteering and Hoarding Act, 1977. This law allows the government to fix the maximum retail prices for products declared as "essential commodities." Although the Act permits the government to regulate prices for as many as 66 essential items, in practice, price controls are actively enforced on only four key commodities: vegetable ghee and edible oil, fertilizers, and mechanically propelled vehicles. This selective price regulation aims to control inflationary pressures, protect consumers from price hikes, and ensure that agricultural inputs remain affordable for farmers.

Furthermore, to stimulate economic growth and enhance foreign trade, export subsidies were also introduced during the year. These subsidies were designed to incentivize domestic producers to access international markets by making their goods more competitively priced abroad. This strategy aimed to diversify exports, improve the trade balance, and boost foreign exchange earnings.

3.4.3 Budget 1986-87

The current expenditure (CE) for the fiscal year experienced a noticeable rise, increasing from Rs 101,728.8 million to Rs 105,572.9 million, as highlighted in the *Budget in Brief*. A significant component of this increase was observed in the category of economic services, which nearly doubled, rising from Rs 1,126 million in the previous year to Rs 2,237.2 million in the revised budget. This marked an impressive increase of 98.6 percent in spending on economic services, reflecting the government's focus on stimulating economic development through targeted investments.

The economic services sector covers a broad range of areas vital for national development, including agriculture and food, irrigation systems, fuel and power generation, rural development programs, industries and mineral resources, as well as transport and communication infrastructure. Among these, the most substantial increase in expenditure was recorded in industries and mineral resources, particularly related to the construction of buildings and supporting infrastructure. This increase signals the government's intention to boost industrial capacity, enhance resource extraction and processing, and create long-term economic assets through infrastructural expansion. Such investments are considered essential for accelerating economic growth, improving productivity, and generating employment across multiple sectors.

3.4.4 Budget 1989-90

For the fiscal year under review, the total current expenditure (CE) was initially proposed at Rs 142 billion. However, during the year, this figure was revised upward to Rs 152 billion, reflecting a substantial increase in government spending. A key component contributing to this overall rise was the defense budget. The announced allocation for defense was set at Rs 52.22 billion, but the revised estimate saw it increase significantly to Rs 61.9 billion—an 18.6% rise compared to the initial projection.

This upward revision in defense spending was primarily driven by the evolving geo-political landscape in the region. Rising tensions and uncertainties in neighboring countries prompted the government to reassess its security and strategic needs. As a result, additional resources were allocated to strengthen defense capabilities, enhance operational readiness, and support military modernization. The government deemed it necessary to prioritize national security by ensuring adequate funding for the armed forces in light of the emerging regional dynamics and potential threats. This increase also reflected the broader policy of maintaining a strong defense posture amid changing international and regional circumstances, as outlined in the *Economic Survey 1989–90*.

3.4.5 Budget 1995-96

The CE in this year's budget was Rs 338.1 billion, which increased to Rs 353.2 billion. CE has increased 15% compared to last year.

The major portion of CE in the budget accounted for debt servicing, which was estimated at Rs 157313.4 MN, indicating an 18.2 percent increase over the revised estimates of 1994-95, which

reaches Rs 164567.5 mn. The reason for the increase in debt servicing was heavy reliance on domestic non-banking borrowing and rapid increase in expenditure on general administration and law and order situation. (Economic survey)

3.4.6 Budget 1999-2000

For the 1999-2000 budget, the budget estimated for CE at Rs 525.9 billion, which was 9.9% higher than the budget for 1998-99, and the revised budget for 1999-2000 was Rs 565.4 billion. The main increase was in debt servicing, estimated at Rs 287.4 billion, and the revised estimate was 313.6 billion. Subsidies were estimated at Rs 24.2 billion, while the revised estimate was Rs 144.2 billion. Subsidies were given to WAPDA and KESC for GST. (Budget in Brief)

The main reason for the sharp increase in the level of debt servicing was the increase in the level of debt stock. (State Bank of Pakistan). An increase in subsidies to WAPDA and KESC for GST and the adjustment of additional surcharge to WAPDA and KESC. (Budget in brief).

3.4.7 Budget 2001-2002

Table 3.2: Spending data of budget 2001-02

CE		**Rs in bn**
	Proposed	**Revised**
	621.7	
Jul-Sep		**138.8**
Jul-Dec		**296.6**
July-Mar (2002)		**466.1**
July- June (2002)		**723.06**

Source: Fiscal operations

The CE of the budget 2001-2002 was estimated at Rs 621.7 billion, showing an increase of 7.3% (Rs 579 billion) over the last year. After the revised budget estimates, the CE increased to Rs

723.06 billion. The major portion of CE was defense and debt servicing. However, debt servicing shows a decrease while defense expenditure increases substantially from the budget estimates of Rs131 billion to revised estimates of Rs151.6 billion. (Budget in Brief)

The incident of December which led to the unprecedented massing of troops by India at the border forced Pakistan to mobilize its troops and defend the border which led to an increase in defense expenditure. (economic survey).

3.4.8 Budget 2002-2003

Table 3.3: Spending data of budget 2002-03

CE		**Rs in bn**
	Proposed	**Revised**
	608	
Jul-Sep		**161.1**
Jul-Dec		**345.1**
July-Mar (2003)		**528.8**
July-June (2003)		**781.8**

Source: Fiscal operations

CE estimates for 2002-2003 were Rs608 billion while the revised estimates were Rs781.8 billion. The major increase in defense servicing and provision of subsidies. The defense budget was Rs 160 billion against the budget estimate of Rs146 billion, subsidies were estimated at Rs20.7 billion and revised estimates were Rs49.78 billion.

Large subsidies were given to WAPDA for adjustment of GST, which was estimated at Rs4 billion, and the revised estimate was Rs 10 billion, the subsidy was given to tub wells for agriculture in Baluchistan, to WAPDA for pickup cash shortfall, and to PASSCO for wheat export, similarly, the subsidy was given to KESC for WAPDA areas. (Budget in brief).

3.4.9 Budget 2005-2006

Table 3.4: Spending data of budget 2005-06

CE		**Rs in bn**
	Proposed	**Revised**
	826.5	
Jul-Sep		**274.2**
Jul-Dec		**634.5**
July-Mar (2011)		**935.6**
July-June (2011)		**1401.8**

Source: fiscal operations

The 2005-2006 fiscal year budget was estimated at Rs 826.5 billion, which was 5.3% higher than the revised estimates for 2004-2005 (Rs 784680 mn). Revised estimates for 2005-2006 stood at Rs 918.8 billion. A bulk of expenditure under CE had been placed under General public services which was Rs 563673 mn against the budget estimates of Rs 503114 mn. An increase in the PSDP budget of Rs50 bn which was allocated to earthquake reconstruction and rehabilitation authority. A subsidy of Rs 72339 mn was estimated for the 2005-2006 budget, which was 21% higher than the previous year, and the revised estimates were Rs 64331. The main reason for providing relief and subsidies was to subsidize electricity mainly to the sensitive public and the government also provides subsidies to consumers to not pass on the full impact of the increase in international oil prices. (Budget in Brief).

3.4.10 Budget 2008-2009

Table 3.5: Spending data of budget 2008-09

CE		**Rs in bn**
	Proposed	**Revised**
	1493	
Jul-Sep		**456.1**
Jul-Dec		**919.1**
July-Mar (2009)		**1415.5**
July- June (2009)		**2041.5**

Source: Fiscal operations

For the fiscal year 2008, the current expenditure (CE) was initially estimated at Rs 1,493 billion. However, during the course of the year, this estimate underwent a significant revision, with the final figure rising to Rs 2,041 billion. This considerable increase in CE reflected the growing financial demands on the government to address various economic and developmental priorities across multiple sectors.

A major factor contributing to this rise in current expenditure was the increased allocation for public services, which included administrative expenses, security, and social services necessary to maintain government operations and public welfare. In addition, a significant portion of the expenditure was directed toward providing targeted subsidies aimed at supporting key industries, particularly the textile and clothing sector, which is a cornerstone of Pakistan's export economy.

To encourage growth and enhance competitiveness in the textile industry, the government extended research and development (R&D) support, aimed at promoting innovation and improving production efficiency. Furthermore, a 3% markup subsidy was introduced specifically for the spinning segment of the textile sector to ease financing costs and support working capital needs. Another important component of this support package was compensatory assistance provided to the users of pure terephthalic acid (PTA), a key raw material in synthetic fiber production. These measures were designed not only to stabilize the domestic textile industry in the face of international competition but also to boost exports and employment within the sector.

3.4.11 Budget 2009-2010

Table 3.6: Spending data of budget 2009-10

CE		**Rs in bn**
	Proposed	**Revised**
	1699	
Jul-Sep		**521**
Jul-Dec		**1058.6**
July-Mar (2010)		**1659.8**
July-June (2010)		**2386**

Source: Fiscal operations

CE for 2009-2010 was estimated at Rs1699.2 bn which reached Rs2386 bn. The main reason for the increase in CE was the increase in General public services which was estimated at Rs 1189081

mn, and the actual budget was then Rs 1471743 mn, a major increase in the PSDP budget which was 54% higher than the revised estimates of 2008-2009. (Budget in Brief). A total of Rs 646 bn was allocated to PSDP projects. The main reasons for the rise in the PSDP budget were to stabilize the macro economy disturbed by external and internal conflicts, to address the infrastructure gap in water, power, and transport, rehabilitate and construct affected areas. (annual budget plan). The subsidies were estimated at Rs 119915 mn, and the revised estimate was Rs 228992 mn. The subsidy was given to WAPDA for GST, tub wells and inter disco tariff differential and to KESC on account of tariff differential. Furthermore, a subsidy was given on the imports of wheat and sugar.

3.4.12 Budget 2010-2011

Table 3.7: Spending data of budget 2010-11

CE		**Rs in bn**
	Proposed	**Revised**
	1997.9	
Jul-Sep		**566.7**
Jul-Dec		**1226.7**
July-Mar (2011)		**1909.8**
July-June (2011)		**2900.7**

In the fiscal year 2010–2011, the total current expenditure (CE) witnessed a substantial increase. The initial budget estimate for CE was Rs 1,997.9 billion, but as the year progressed, this figure rose significantly and reached Rs 2,900.7 billion by the end of the fiscal year. This sharp rise indicated the growing financial pressures on the government, driven by the need to support critical sectors, meet rising operational costs, and fulfill various public service obligations.

One of the most notable components contributing to this increase was the surge in subsidies. Against an originally budgeted estimate of Rs 126,684 million for subsidies, the actual amount disbursed reached an overwhelming Rs 395,801 million. This represents more than threefold increase from the initial allocation, underscoring the scale of government intervention during the period.

Several key factors were responsible for this dramatic rise in subsidies. A significant portion of the funds was directed toward Research and Development (R&D) support for the textile sector, which remains a vital contributor to Pakistan's exports and employment. In addition to this, substantial subsidies were extended to the Karachi Electric Supply Company (KESC) to cover the cost of the "pickup differential," which refers to the financial shortfall between the cost of electricity generation and the tariff charged to consumers. Likewise, the Water and Power Development Authority (WAPDA) received financial assistance to manage the inter-Disco tariff differential, aimed at bridging the gap between the actual cost of electricity distribution and the subsidized consumer rates.

These measures were undertaken to stabilize the power sector, support industrial growth, and ensure affordable energy access for both households and businesses. The overall increase in CE and subsidies during this period reflects the government's efforts to manage economic challenges while striving to maintain service delivery and industrial competitiveness.

3.4.13 Budget 2011-2012

Table 3.8: Spending data of budget 2011-12

Total expenditure		**Rs in bn**
	Proposed	**Revised**
	2835.37	
Jul-Sep		**790.8**
Jul-Dec		**1667.7**
July-Mar (2012)		**2634.3**
July-June (2012)		**3936.2**

Source: Fiscal operations

Total expenditure was estimated at Rs 2835.37 bn while the revised estimates increased to Rs 3936.2 bn. The main components of CE which increases were defense expenditure, interest payments and increase in provision of subsidies.

The economy was under tremendous pressure in 2011-2012, flood-related expenses and higher subsidies. To overcome security-related issues, the government has increased defense expenditure over the last few years. (economic survey). After the revised estimates the budget for defense services was Rs510179 mn against the proposed budget of Rs 495215 mn. The increase in interest

payments was due to the increase in domestic interest rate, proposed interest payment was Rs 790977 mn which increased to Rs 843839 mn, out of which domestic interest payment was Rs 771873 mn and interest on foreign debt was Rs 71967 mn. Subsidies were Rs 166448 mn while revised estimates were Rs 512292 mn. The increase in subsidies was mainly due to the high mass provision of subsidy to WAPDA, which was Rs 419018 mn against the proposed budget of Rs122700 mn.

For the year 2011-12 the total budget for public sector development program (PSDP) was estimated at Rs 730 bn which increased to Rs 733 bn, which was 60% higher than the revised estimates of 2010-11. Provided a budget of Rs 381 mn for national food security and research, 2 bn for ministry of professional and technical training, for law and order a budget of Rs 10.4 bn was provided to interior division.

3.4.14 Budget 2012-2013

Table 3.9: Spending data of budget 2012-13

CE		**Rs in bn**
	Proposed	**Revised**
	2611.94	
Jul-Sep		**812.3**
Jul-Dec		**1721.7**
July-Mar (2013)		**2642**
July-June (2013)		**3660.4**

Source: Fiscal operations

The total budget for CE in this fiscal year was estimated at Rs 3203 bn which increased to Rs3478 bn in the revised estimates of the budget. CE stood Rs 3660.4 bn against the budget estimates of Rs2611.94 bn.

Most of the expenditure goes to General public services, which was Rs 2143.85 bn against the proposed budget of Rs 1876.84 bn. The increase in General public services was due to the rise in servicing of domestic debt, increase in executive and legislative organs, financial and fiscal affairs,

and external affairs. Subsidies were proposed Rs 208.5 bn while revised estimates increased to Rs 367.47 bn. Increase in subsidies to WAPDA and KESC in tariff differential.

3.4.15 Budget 2013-2014

Table 3.20: Spending data of budget 2013-14

CE		**Rs in bn**
	Proposed	**Revised**
	3196.08	
Jul-Sep		**868.3**
Jul-Dec		**1887.5**
July-Mar (2014)		**2904.5**
July-June (2014)		**4004.5**

Source: Fiscal operations

CE was estimated at Rs 3196.08 bn, while the revised estimates increased to Rs 4004.5 bn. A major increase in defense expenditure which was estimated at Rs 627 bn which was Rs 570 bn last year and the revised estimates of budget 2014-2015 increased to Rs 629 bn. Increase in subsidies from budget estimates of Rs 240 bn to revised estimates of 323 bn.

A major increase in defense expenditure was due to providing security to CPEC and for operation Zarb-e-Azb. (budget speech). An increase in subsidies was the major provision of subsidies to WAPDA and KESC in inter-disco tariff differential. (budget in brief).

3.4.16 Budget 2014-2015

Table 3.11: Spending data of budget 2014-15

CE		**Rs in bn**
	Proposed	**Revised**
	3463	
Jul-Sep		**1050**
Jul-Dec		**1989**
July-Mar (2015)		**3199**
July-June (2015)		**4424.7**

Source: Fiscal operations

For the fiscal year 2014–2015, the total budgeted expenditure experienced a considerable rise. The announced budget estimate for total expenditure was set at Rs 3,463 billion. However, by the end of the fiscal year, actual spending had significantly exceeded projections, reaching Rs 4,424.7 billion. This sharp increase highlights the growing fiscal demands faced by the government in addressing national priorities, including defense, public services, subsidies, and developmental initiatives.

A particularly notable component of this increase was the rise in defense expenditure. In the previous fiscal year, defense spending stood at Rs 629 billion. For 2014–2015, the budget estimate for defense was increased to Rs 700 billion, reflecting the government's recognition of evolving national security needs. However, actual defense expenditure surpassed even this revised estimate, reaching Rs 720 billion by the end of the fiscal year.

3.4.17 Budget 2015-2016

Table 3.32: Spending data of budget 2015-16

CE		**Rs in bn**
	Proposed	**Revised**
	3482	
Jul-Sep		**1085.2**
Jul-Dec		**2104.3**
July-Mar (2016)		**3406.9**
July-June (2016)		**4694.2**

Source: Fiscal operations

Total expenditure was Rs 4694.2 bn against the budget estimates of Rs 3482 bn. The persistent increase in the defense budget has now reached 10%. This year, the defense budget reached Rs 781 bn, mainly due to security reasons.

3.4.18 Budget 2016-2017

Table 3.43: Spending data of budget 2016-17

CE		**Rs in bn**
	Proposed	**Revised**
	3843.9	
Jul-Sep		**1070.7**
Jul-Dec		**2241.6**
July-Mar (2017)		**3605.1**
July-June (2017)		**5197.8**

Source: Fiscal operations

CE rises to Rs 5197.8 bn against the proposed budget of Rs 3843.9 bn. Increase in expenditure of running civil government which was proposed of Rs 352.7 bn which increased to Rs 398.8 bn. Increase in subsidies from Rs 140.6 bn to Rs 169 bn. The main reason for the increase in subsidies is mentioned in the budget in the brief section of the budget which was due to the provision of subsidy on fertilizers of Rs25 bn and increase of subsidy to WAPDA in inter disco tariff differential of Rs 91 bn.

3.4.19 Budget 2017-18

Table 3.54: Spending data of budget 2017-18

CE		**Rs in bn**
	Proposed	**Revised**
	3763.7	
Jul-Sep		**1240.5**
Jul-Dec		**2545.2**
July-Mar (2018)		**4075.4**
July-June (2018)		**5854.2**

Source: Fiscal operations

In the given fiscal year, the total current expenditure (CE) experienced a significant upward revision. The proposed budget estimate for CE was initially set at Rs 3,763.7 billion. However, as the fiscal year progressed, actual requirements and unforeseen fiscal demands led to a sharp increase, with the revised estimates reaching Rs 5,854.2 billion. This substantial rise reflects the

growing burden on public finances, driven largely by enhanced spending in key sectors, particularly defense. One of the most notable contributions to this increase was the defense budget. Initially, defense expenditure was proposed at Rs 920 billion. However, due to escalating security needs and operational demands, the revised estimate rose to Rs 999.2 billion. This represented a significant increase from the previous year's actual expenditure of Rs 781 billion in 2015, marking a continuous upward trend in defense-related allocations.

3.4.20 Budget 2018-19

Table 3.156: Spending data of budget 2018-19

CE		**Rs in bn**
	Proposed	**Revised**
	4780	
Jul-Sep		**1479.9**
Jul-Dec		**2984.3**
July-Mar (2019)		**4798.3**
July-June (2019)		**7104**

Source: Fiscal operations

Revised CE estimates were Rs 7104 bn against Rs 4780.4 bn. The reason for the increase in government expenditure was the increase in expenditure on Markup payments on domestic and foreign debt, which increased from Rs 1620 bn of the proposed estimates to the revised estimates of Rs1987 bn. Another reason for the increase in expenditure was to increase defense expenditure which was Rs 999 bn in the 2017 fiscal year and reached Rs 1137 bn.

The increase in Markup payment of domestic and foreign debt was caused by the growth of public debt (domestic and foreign). An increase in interest rates and a depreciation of the exchange rate causes an increase in interest payments. The increase in defense expenditure was due to the heightened security issues. (economic survey 2018-19)

3.4.21 Budget 2019-20

Table 3.16: Spending data of budget 2019-20

CE		**Rs in bn**
	Proposed	**Revised**
	7288.17	
Jul-Sep		**1582.1**
Jul-Dec		**3721.3**
July-Mar (2020)		**5611.5**
July-June (2020)		**8532**

Source: Fiscal operations

The increase in markup payments of 39.4% was primarily due to the rise in domestic interest rates, resulting in a higher share of markup payments, which reached 29% in current expenditure (CE), according to the Economic Survey's Fiscal Development section. Subsidies initially proposed at Rs 271 billion were later raised to Rs 349 billion, marking a 71% increase compared to the previous year. This surge was mainly due to the COVID-19 pandemic and significantly higher energy-related subsidies for power generation. Additionally, the increase in grants was mainly due to the reclassification of the Benazir Income Support Program (BISP) from development to current expenditure, amounting to Rs 242 billion.

3.4.22 Budget 2020-21

Table 3.77: Spending data of budget 2020-21

CE		**Rs in bn**
	Proposed	**Revised**
	7840	
Jul-Sep		**1812.5**
Jul-Dec		**4029.3**
July-Mar (2021)		**6085.4**
July-June (2021)		**9084**

Source: Fiscal operations

CE was estimated at Rs 7840 bn and the revised estimates increased to Rs 9084 bn. The economic stimulus of Rs 1.2 trillion announced in March 2020 has been extended and Rs 155 bn extra was released to mitigate the socio-economic impact of COVID-19. The government aims to strike a balance between corona expenditure and fiscal deficit and announced the Ehsaas program for the support of vulnerable segments of society. Subsidies were proposed of Rs 209 bn and then increased to Rs 430 bn. The increase in subsidies was mainly to the petroleum and power sector to alleviate the impact of inflation on citizens, especially to the poor segment of society. Furthermore, 216 bn was provided for social protection. (budget in brief).

3.4.23 Budget 2021-22

Table 3.88: Spending data of budget 2021-22

Expenditure		**Rs in bn**
	Proposed	**Revised**
	9124.4	
Jul-Sep		**1968.1**
Jul-Dec		**4675.6**
July-Mar (2022)		**7378**
July-June (2022)		**11521**

Source: Fiscal operations

In the fiscal year 2021, the government aims to increase development spending for more job creation, reduce inflation, and monitor price controls, continue the COVID-19 package, provide subsidies, and clear circular debt. CE for this year was estimated at Rs 9124.1 bn, which increased to Rs 8531 bn. The reason for the increase in government expenditure was due to an increase in markup payments, which was proposed at Rs 3059 bn and increased to Rs 3143 bn, the increase in Markup payments was due to an increase in the domestic interest rate and depreciation of exchange rate, subsidies which were proposed of Rs 682 bn and then increased to Rs 1514 bn, increase of subsidy to WAPDA/PEPCO, payments to IPP's of Rs 434 bn, PM package of Rs 80 bn in tariff differential, a heavy subsidy to petroleum, which was proposed of Rs 20 bn and then reaches to Rs 371 bn, main reasons for increase in petroleum subsidy was provided to LNG sector for providing GAS on lower rates to industry, domestic consumers through SNGPL of Rs 36 bn and for Parco price differential claim which was PM package of Rs 250 bn and subsidies were provided for imported wheat and fertilizer plant subsidy.

There was also a significant increase in the PSDP budget which was Rs 1324 bn last year and in fiscal year 2021 this budget increased to Rs 2135 bn and then the revised estimates increased to Rs 2158.7 bn. The main reason for the increase was the provision of a budget of Rs 61 bn for the viability gap fund for PPP projects and a budget of Rs 22 bn was provided for SDG's and community development. (Budget in brief)

3.4.24 Budget 2022-23

Table 3.19: Spending data of budget 2022-23

CE		**Rs in bn**
	Proposed	**Revised**
	12744.2	
Jul-Sep		**2538.1**
Jul-Dec		**6061.2**
July-Mar (2010)		**9244.5**
July-June (2010)		**14447.8**

Source: Fiscal operations

For the fiscal year, 2022 government aims to revive economic stability and curb inflation to move to sustainable and inclusive growth, introducing targeted subsidies for the provision of food items at a subsidized rate.

CE for this year was estimated at Rs 12744.2 bn and then increased to Rs 14447.8 bn. The major increase in expenditure was interest payments on domestic and foreign debt, proposed of Rs 3950 bn, which was Rs 5520 bn in the revised estimates, the reason for the increase was a rise in the domestic interest rate and depreciation of the exchange rate. Another major increase was in subsidies, which were proposed at Rs 664 bn and then rose to Rs 1103 bn, the increase was due to emergency relief for flood-affected areas and affectees, which included the Kisan package and flood wavier, comprised of Rs 48 bn, Rs 180 bn was paid to IPP's, a subsidy of Rs 102 bn was given to petroleum products for providing these products on lower rates to industries and additional subsidy of Rs 44 bn was given for flood, which includes fertilizer subsidy, subsidy on housing scheme, Waiver of Markup on Outstanding Loans for Farmers in Flood Affected Areas and Markup subsidy for Rabi season. (Budget in Brief)

3.4.25 Budget 2023-24

Table 3.90: Spending data of budget 2023-24

CE		**Rs in bn**
	Proposed	**Revised**
	13344.4	
Jul-Sep		**3172.6**
Jul-Dec		**8564.6**
July-Mar (2010)		**12333.2**
July-June (2010)		**18570.9**

Source: Fiscal operations

Pakistan was facing both domestic and global challenges, in response to these challenges the government tried to improve public finances by implementing reforms related to revenue and spending. The massive flood raises the need for an increase in expenditure for flood-related activities. (Economic survey)

CE for the fiscal year 2023 was estimated at Rs 13344.4 bn and revised estimates increased to Rs 18570.9 bn. The bulk of CE goes under interest payments of domestic and foreign debt, which was proposed at Rs 72303 bn for the fiscal year 2023 and reached to high level of Rs 8251 bn, almost growing by 79%. This increase was attributed to both the increase in domestic and global interest rates aggravated by rupee depreciation. The increase in grants, especially in BISP, reaches Rs 466 bn. Subsidies were proposed at Rs 1064 bn and increased to Rs 1071 bn. Increase in the subsidy of wheat import and other subsidies to support the vulnerable segment of the society. Defense expenditure rose from 1804 bn to 1854 bn. (budget in brief)

3.5 Local Projection Method

This study employs the local projection (LP) method, as introduced by Jordà (2005), to investigate the impact of government spending shocks on key macroeconomic indicators in Pakistan, specifically output and inflation. To identify these shocks, the study adopts a narrative approach, isolating exogenous government spending by analyzing historical documents such as budget speeches, economic surveys, and annual budget statements. Unlike vector autoregressions (VARs), the LP method does not rely on a rigid parametric structure for modeling dynamics. This flexibility allows LP to yield consistent estimates even in the presence of potential VAR misspecification.

Additionally, LP mitigates the issue of error accumulation common in VARs, where small early-stage errors can compound over time, by estimating each forecast horizon independently, thereby limiting error propagation.

The framework for local projection is as follows:

$$Y_{t+h} = \alpha_h + \beta_h Shock^G + \varepsilon_{t+h} \qquad (3.1)$$

- Y_{t+h} is the value of the dependent variables, in this case, output and inflation
- $Shock^G$ denotes the government spending shock at time t, identified through narrative records
- β_h is the estimated impulse response at horizon h,
- ε_{t+h} is the error term

3.6 The Structural VAR approach

Since the groundbreaking work of Sims (1980) and Blanchard & Perotti (2002), Structural VAR has become a prominent and widely used tool in empirical macroeconomics. It provides a framework for identifying and analyzing the effects of structural economic shocks. Structural VAR has been used extensively to study the impact of fiscal policy shocks, monetary policy shocks, and other non-policy shocks. Blanchard & Perotti (2002) suggest that SVAR seems more suitable for studying fiscal policy than monetary policy. They argue that, unlike monetary policy, fiscal policy faces significant delays in implementation; within a short period, say a quarter, there is little or no discretionary fiscal response to unexpected movements in economic activity. Again, in contrast to monetary policy, many changes in fiscal policy occur independently of current economic conditions.

Identification in the structural VAR model relies on key assumptions, the shocks can be extracted or inferred from the available data, both current and past. In other words, the model assumes that by analyzing the relationships between the variables over time, we can isolate and identify the underlying shocks that drive economic changes. This is crucial because SVAR models aim to distinguish between different types of shocks. Blanchard & Perotti (2002) estimate SVAR using the historical relationship between government spending and taxes to identify certain parameters. A key identification challenge in fiscal policy analysis is distinguishing exogenous government spending changes from those that occur endogenously. They address this issue by imposing a key

structural assumption: when government spending is ordered first, to ensure that it does not respond contemporaneously to other variables within the same period. This assumption provides the isolation of structural government spending shocks if government spending responds to other variables within the same period; this creates endogeneity.

This study will adopt the structural VAR used by Blanchard & Perotti (2002) in which government spending is ordered before the other variables to identify fiscal policy shocks. For the narrative approach, the effects of government spending would be estimated with the following reduced for reduced-form VAR:

$$Y_t = A_1 Y_{t-1} + Y_{t-2} + \cdots + A_p\, Y_{t-p} + D_t + \varepsilon_t \qquad (3.2)$$

Where Yt is a vector of endogenous variables (Government spending, Output, and Inflation), Ai is the coefficient of matrices, Dt is the narrative-based measure of government spending shocks and et represents structural shocks. This specification builds on Burnside, Eichenbaum, & Fisher (2004) who incorporate narrative shock as exogenous regressors within the VAR framework. This contrasts with the earlier strategies such as Ramey & Shapiro (1998) who include them as dummy variables in their univariate AR, or Ramey V. A. (2011) where such shocks were modeled as endogenous variables within the VAR system.

The structural representation of VAR can be written as:

$$A_0 Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{p-1} \varepsilon_t \qquad (3.3)$$

A_0: contemporaneous matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ a21 & 1 & 0 \\ a31 & a32 & 1 \end{bmatrix}$

E_t: orthogonal shocks

The structural equations are:

$G_t = \beta_1 + A_{11}G_{t-1} + A_{12}Y_{t-1} + A_{13}\pi_{t-1} + E_{1t}$

$Y_t = \beta_2 + A_{21}G_t + A_{21}\, G_{t-1} + A_{22}\, Y_{t-1} + A_{23}\pi_{t-1} + E_{2t}$

$\Pi_t = \beta_3 + A_{31}G_t + A_{32}Y_t + A_{31}G_{t-1} + A_{32}\, Y_{t-1} + A_{33}\, \pi_{t-1} + E_{3t}$

G_t: Government spending does not respond to output and inflation contemporaneously

Y_t: Output responds to government spending but not to inflation contemporaneously

Π_t: Inflation responds to both government spending and inflation

CHAPTER 4

RESULTS AND DISCUSSION

This study employs a comprehensive approach by utilizing both annual and quarterly datasets to enhance the robustness of the analysis and to effectively capture any potential differences in the economic responses to government spending shocks across different time frequencies.

In particular, the study differentiates between two types of government spending: anticipated and unanticipated. Anticipated government spending refers to the proposed expenditures that are publicly disclosed in the official budget documents before the fiscal year begins. whereas unanticipated government spending represents the shock component, the difference between the proposed and actual government expenditures.

To analyze the effects of both anticipated and unanticipated government spending on key macroeconomic variables such as output and inflation, the study utilizes the Local Projection (LP) method. This econometric technique is particularly well-suited for estimating impulse response functions in the presence of nonlinearities or structural changes, and it allows for a flexible assessment of dynamic responses over different horizons. The impulse response functions generated through this method are presented with 95% confidence intervals to indicate the precision and statistical significance of the estimated effects.

Furthermore, to validate the findings and compare methodological robustness, the study compares the results derived from the Local Projection method with those obtained using the Structural Vector Autoregression (SVAR) approach. This comparison is provided in detail in Appendix A, where differences in the response profiles and estimation strategies between the two methods are discussed. The dual-method analysis enhances the credibility of the results and provides a more comprehensive perspective on the macroeconomic impacts of government spending shocks.

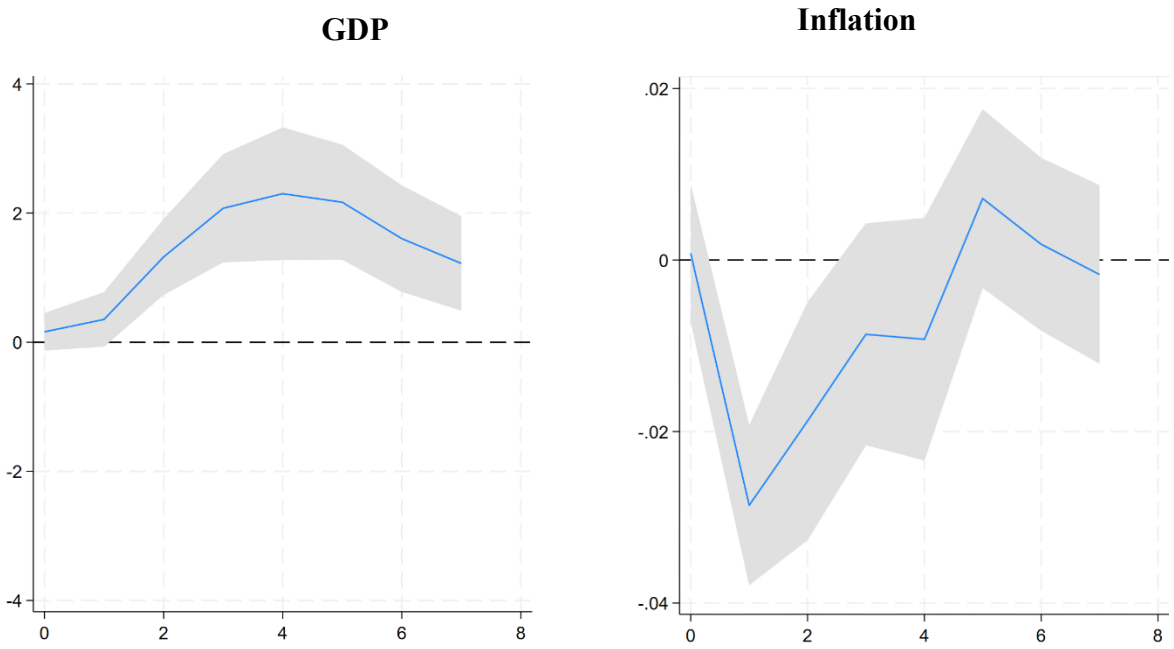

Figure 4.1: Response of GDP and inflation to unanticipated government spending (Annual Analysis)

The response of GDP to an unanticipated government spending shock in Pakistan is positive and statistically significant. When the government spending is unanticipated, it leads to a lagged increase in GDP, peaking around the fourth year with a magnitude exceeding 2 units. After the peak, the effect gradually declines but remains positive over the horizon. Two key characteristics of government spending can explain this pattern: first, fiscal policy decisions often involve procedural delays. Blanchard & Perotti (2002). Since governments are typically unable to react immediately to changes in the macroeconomic environment, their policy responses often include delays. Secondly, there are implementation lags, meaning a temporal gap exists between the announcement and actual execution of public policy measures.

Inflation falls in response to the government spending shock. Still, in the medium term, inflation increases modestly, peaking around step 5, even though the confidence band is large and the response is insignificant at most horizons.

The result is consistent with the new classical approach, which indicates that unanticipated government spending will affect output positively. The observed decline in inflation following an unanticipated government spending shock is consistent with the findings of Jørgensen & Ravn

(2022). The response of inflation to the unanticipated increase in government spending is somewhat puzzling, but this relationship has been found in other studies, as seen, for example, in Uhlig (2005), Zubairy (2010), Munir & Riaz (2020), and Saba, Saqib, & Iqbal (2015).

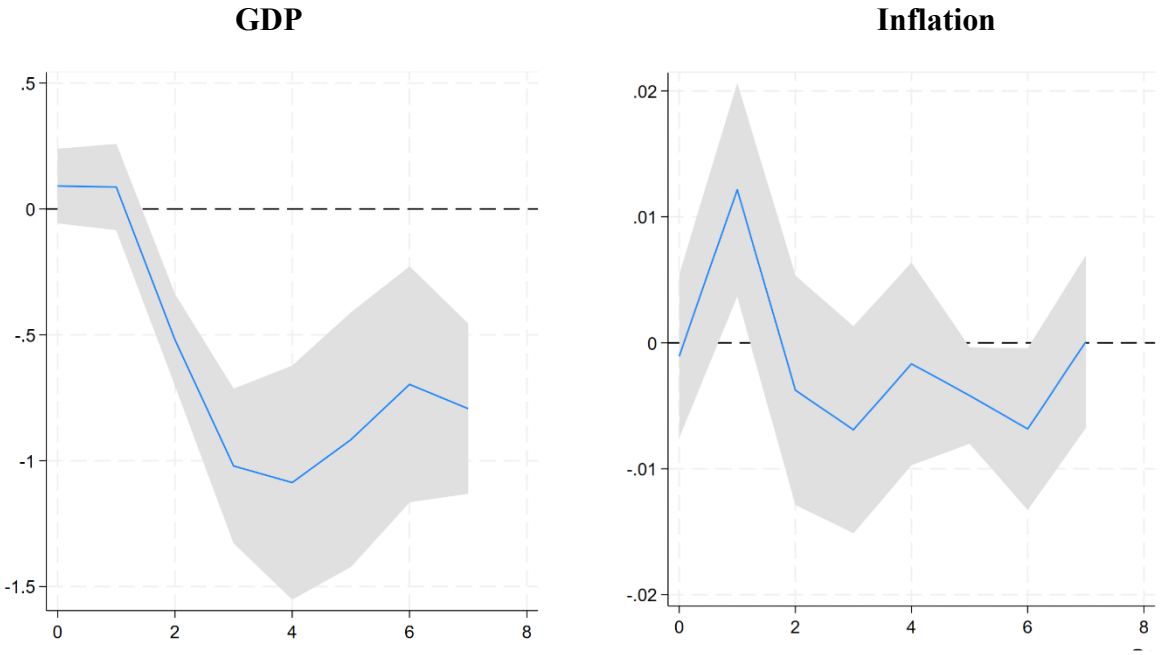

Figure 4.2: Response of GDP and Inflation to Anticipated Government Spending (Annual Analysis)

The GDP exhibits a negative and immediate response to an anticipated government spending shock, with the decline intensifying and persisting until the fourth period, after which there is a partial, yet still negative, recovery. In the context of Pakistan, where government expenditure is predominantly debt-financed, which increases the demand for domestic credit, raising the interest rate, this pattern reflects the crowding-out of private sector activity. When public spending is funded through borrowing, it may lead consumers to expect higher future taxation, consistent with the Ricardian equivalence hypothesis. As a result, private consumption may contract, counterbalancing any potential output gains from increased government spending. This result aligns with earlier empirical studies by Javid and Arif (2009), Abbas, Aftab, & Ameen (2018), and Lozano & Rodríguez (2011), all of which observed a negative relationship between government spending and output.

On the other hand, inflation shows a modest and short-lived increase in response to anticipated government spending. In the medium term, the inflation either turns negative or fluctuates around zero, indicating that the inflationary impacts of anticipated government spending are not persistent.

Quarterly analysis:

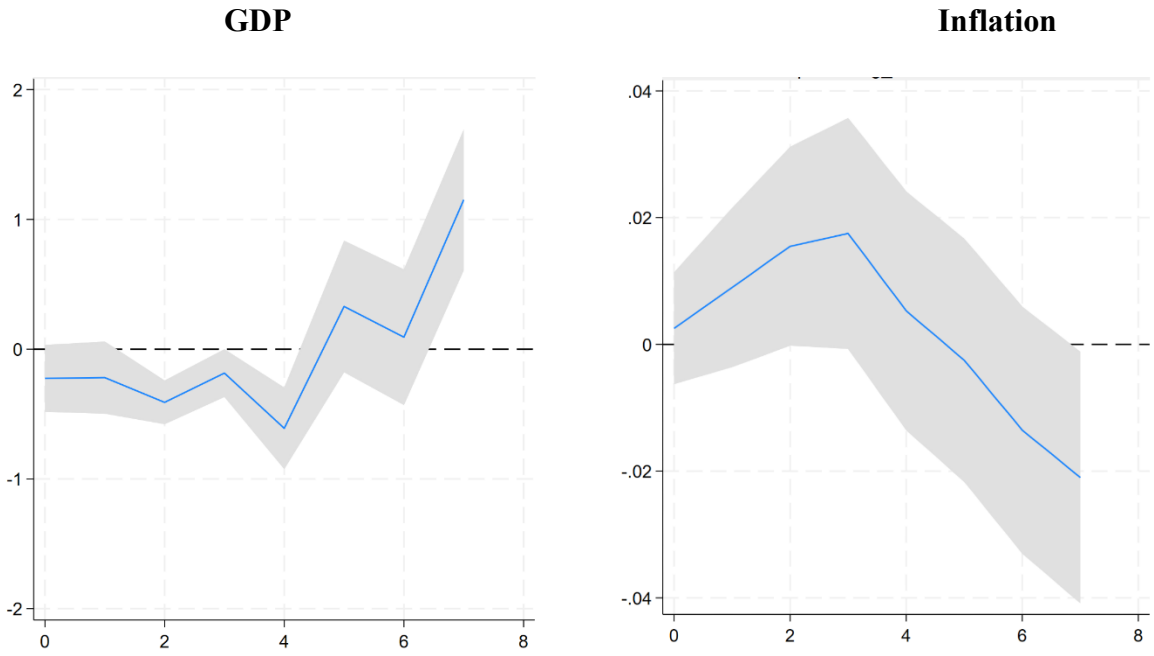

Figure 4.3: Response of GDP and Inflation to Unanticipated Government Spending (Quarterly analysis)

The response of GDP to an unanticipated government spending shock is initially neutral, showing no immediate change. It then turns slightly negative but begins to rise after one quarter, becoming positive and exceeding a value of 1 by the seventh quarter. Inflation initially rises but subsequently experiences a sustained decline, turning negative from approximately the fourth quarter onward. Although the confidence intervals widen over time, they indicate that the effect is statistically insignificant in the medium term. This finding is consistent with Shaheen & Turner, (2022) who, using a recursive approach, reports that due to the crowding-out effect, an increase in government spending leads to a reduction in output that is statistically insignificant. Similarly, a positive shock to government spending initially raises inflation, though this effect is also statistically insignificant.

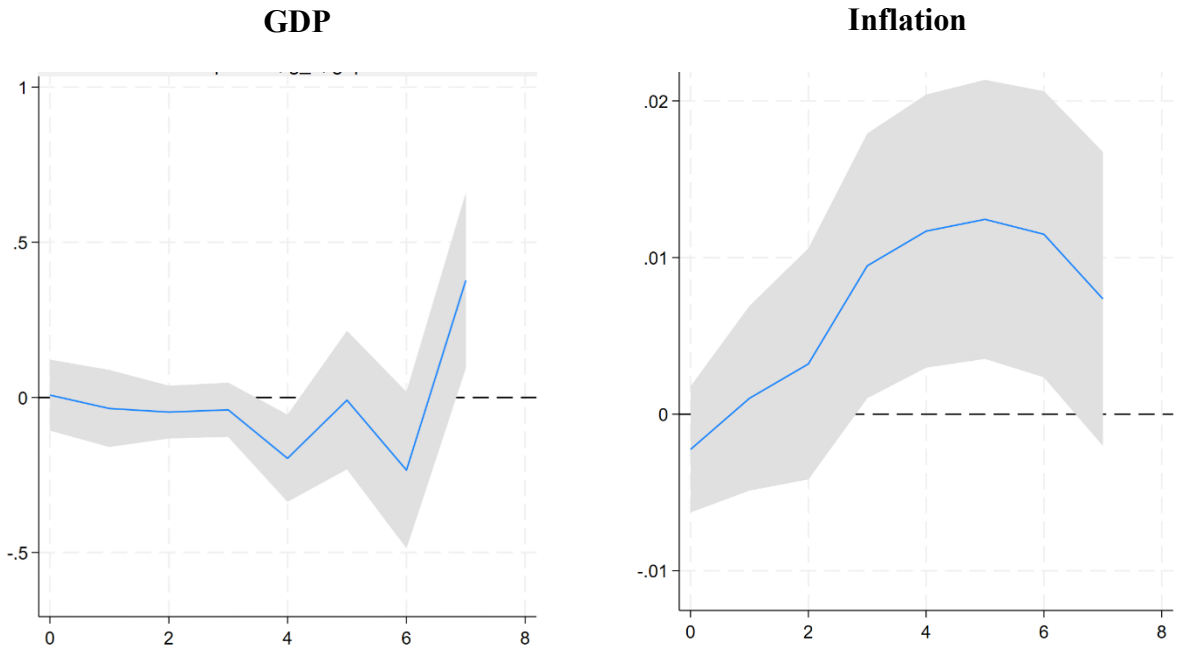

Figure 4.4: Response of GDP and Inflation to Anticipated Government Spending (Quarterly analysis)

The anticipated government spending does not affect output in the short run, but it turns slightly negative in the medium term, followed by a sharp increase in the seventh quarter. Still, overall GDP is insignificant over the horizon. Meanwhile, inflation shows a clear and significant response, peaking around the fourth quarter. These results are consistent with the theoretical framework of the policy ineffectiveness proposition, which is based on the rational expectations hypothesis. According to this view, anticipated government spending has no significant effect on real output in the short term, limiting the effectiveness of macroeconomic policy. When agents form expectations rationally, they adjust their behavior in anticipation of policy actions, thereby neutralizing any intended stimulative effects. As a result, such policies influence nominal variables, such as the price level, rather than real economic activity, potentially causing inflation or deflation without producing lasting changes in output.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This study examines the impact of government spending on output and inflation by employing a narrative approach to identify exogenous shocks in government spending. The spending data is extracted from official budget documents, such as the *Budget in Brief* and annual budget reports. Nominal GDP data were obtained from the State Bank of Pakistan and converted to real GDP by deflating with the GDP deflator. Similarly, inflation data were also sourced from the State Bank of Pakistan. This study primarily investigates the question: "How do government spending shocks affect output and inflation?" To ensure robustness and capture potential variations in responses, both quarterly and annual data spanning from 1981 Q1 to 2023 Q4 are utilized. The Chow & Lin (1971) method is used for quarterizing real GDP and Government spending, which are recorded on an annual basis.

To enhance methodological reliability and mitigate biases linked to relying on a single estimation approach, the analysis employs both the Local Projection method and the Structural Vector Autoregression (SVAR) framework. A comparative analysis of the LP and SVAR results is provided in the appendix. The results from the local projection method, based on annual unanticipated government spending shocks, indicate that GDP responds with a lag, reaching a statistically significant peak around the fourth year. In contrast, inflation initially declines and then rises after about one year; however, this increase in inflation is not statistically significant. Conversely, annual anticipated government spending shocks have a negative impact on GDP, while their effect on inflation is short-lived and lacks persistence. Regarding quarterly data, anticipated government spending shocks do not significantly influence GDP but are associated with a rise in inflation, suggesting that higher anticipated spending may contribute to inflationary pressures. For quarterly unanticipated shocks, GDP does not react immediately but begins to increase and turns positive after one quarter, whereas the response of inflation remains statistically insignificant throughout.

The policy implication drawn from the annual results is that the government should rationalize its spending and borrowing policies. To bring positive changes in GDP, it is recommended that government should bring surprise changes in spending, While the anticipated government

spending has a negative impact on GDP. This is primarily due to substantial borrowing from commercial banks, which crowds out private investment. The increased demand for domestic credit leads to higher interest rates, making it more difficult for the private sector to access funding. To address this, the government should reduce its reliance on borrowing from domestic banks to create space for private sector investment. Secondlly, government should invest in research and development to support production processes of both public and private sectors to meet the shifting demand, consumer preferences and technological advances.

The main limitation of this study stems from the lack of high-frequency data. To address this, the study applies the Chow-Lin method to convert annual data, such as real GDP and government spending, into quarterly series. Although quarterly government spending data is accessible from fiscal operations and calculations starting in 2001, no such data exists for earlier years, requiring quarterization for the pre-2001 period.

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APPENDICES

APPENDIX A

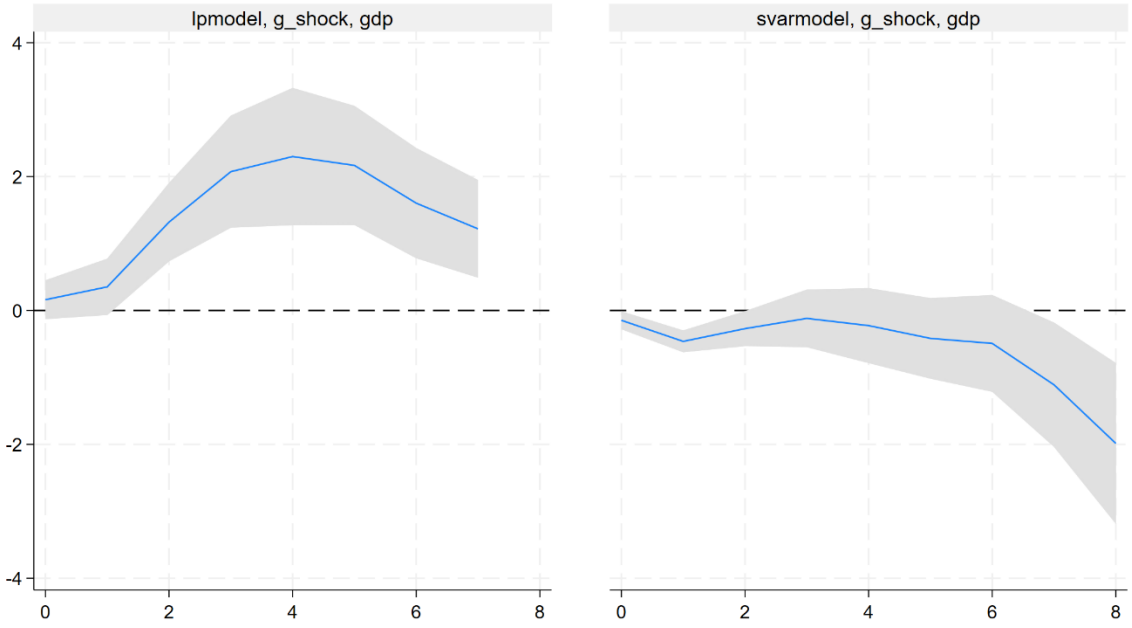

Figure A.1 Impulse responses of GDP

Note: The above figure illustrates the comparison of Local projection and SVAR impulse responses of GDP to an unanticipated government spending shock on annual frequency

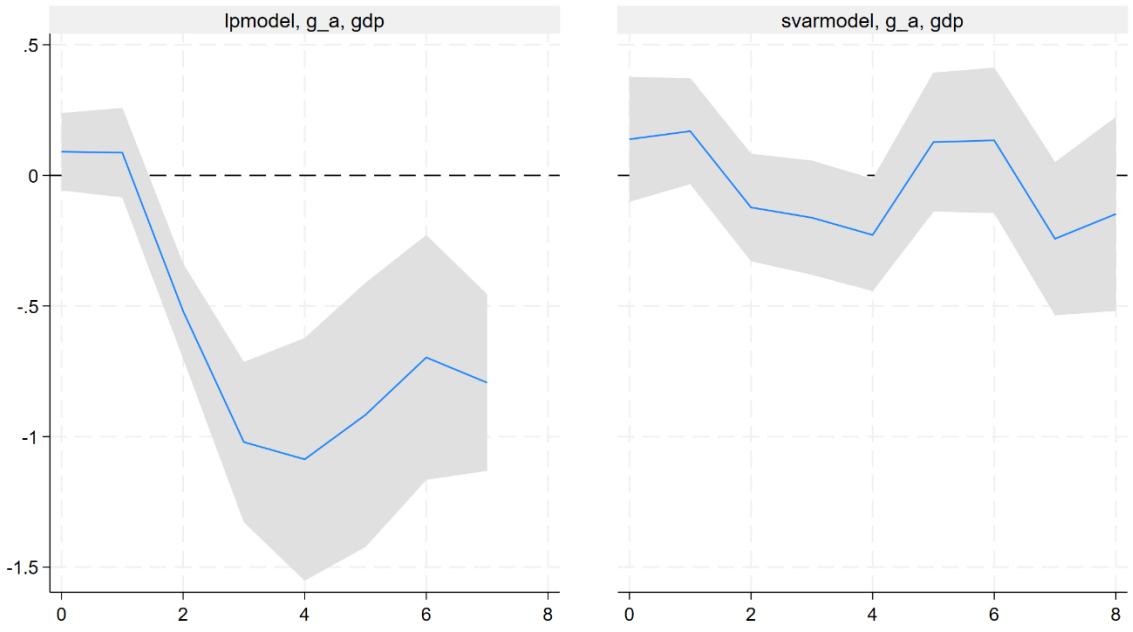

Figure A.2 Impulse responses of GDP to anticipated government spending (Annual Analysis)

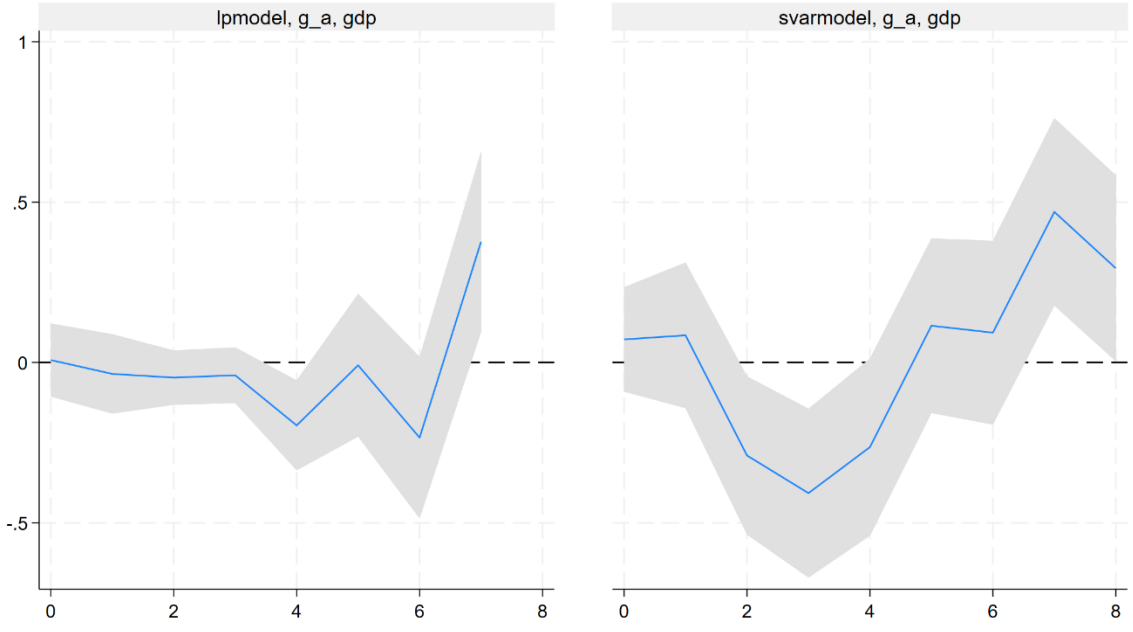

Figure A.3: Impulse response of GDP

Note: The figure illustrates impulse responses of quarterly anticipated government spending and the response of GDP

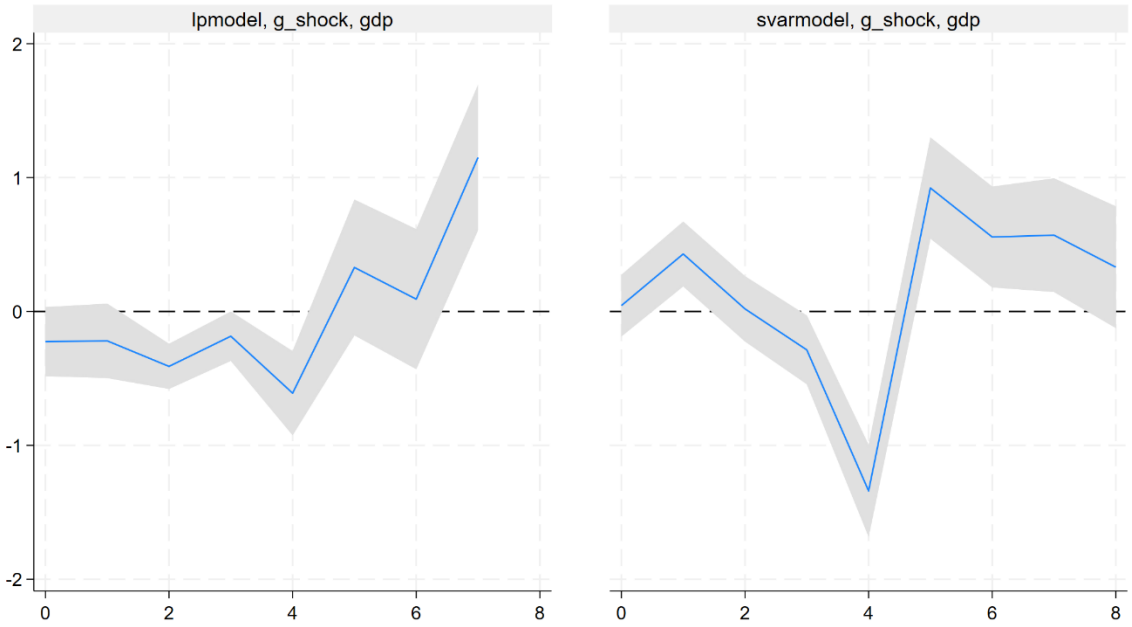

Figure A.4: Impulse response of GDP to an unanticipated government spending shock (quarterly analysis)

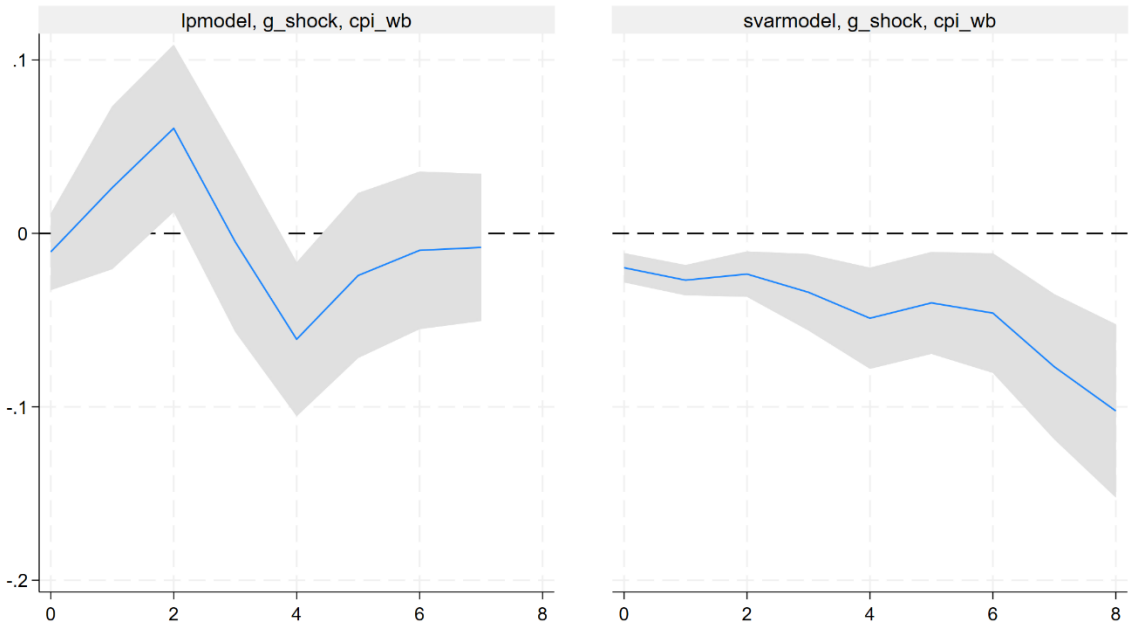

Figure A.5: Impulse responses of CPI to unanticipated government spending (Annual Analysis)

Note: This study also uses data from the World Bank for better analysis, but the response of CPI is still insignificant

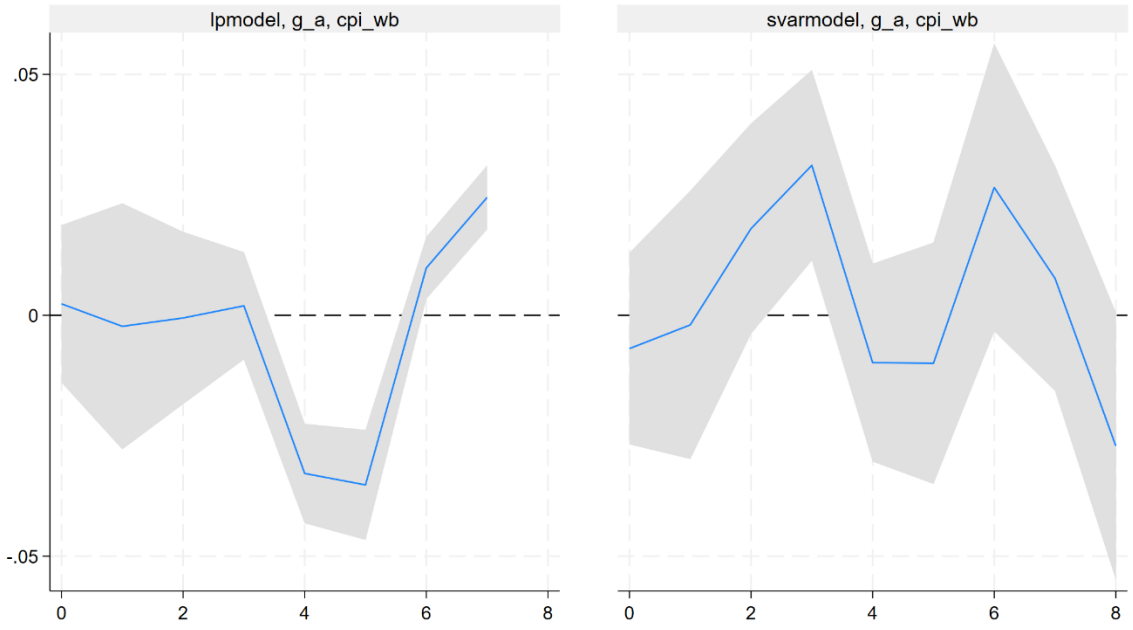

Figure A.6: Impulse response of CPI to anticipated government spending