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Dynamic Interplay: Evaluating Fiscal and Monetary Policies in Shaping Pakistan's Macroeconomic Landscape

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Abstract

This study evaluates the dynamic interaction between fiscal and monetary policies and their collective impact on Pakistan's macroeconomic performance from 1980 to 2023. Using a Vector Autoregression (VAR) model along with analyses of Impulse Response Function (IRFs) and Variance Decomposition (VDs), the research examines how key macroeconomic variables such as growth rate of gross domestic product, inflation, debt, unemployment and exchange rate respond to fiscal and monetary policy shocks. Monetary policy is represented by interest rate, while fiscal policy is measured through the budget deficit as a percentage of GDP. The findings of the study indicate that monetary policy exerts a stronger influence on inflation, GDP growth, and exchange rate, whereas, fiscal policy's role is more prominent in unemployment management. The results reveal that a tight monetary policy, slows down economic growth, raises unemployment and depreciates the exchange rate in the short run, while helping in controlling inflation after a few lags. On the other hand, fiscal expansion, while having limited immediate impact on growth, contributes to inflationary pressures in economy. Results of variance decomposition suggest that monetary policy has relatively greater potential in determining the variances of GDP, inflation and debt while fiscal policy dominates in explaining variation in unemployment. The study concludes that monetary policy has relatively more potential in shaping Pakistan's macroeconomic landscape. This study emphasizes the importance of fiscal and monetary policy coordination, as well as exchange rate stabilization, in preventing supply shocks. Additionally, the study supports the autonomy of the State Bank of Pakistan in ensuring effective monetary management free from political influence. The findings provide policymakers with valuable insights into optimizing fiscal and monetary policy coordination for long-term economic growth and stability.

Keywords: *Monetary Policy, Fiscal Policy, Fiscal Monetary Interaction, Policy Effectiveness, Macroeconomic Performance.*

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Introduction

The economic landscape of Pakistan, similar to many emerging economies, has been a debatable subject of dynamic and evolving economic policies. Over the last four decades, Pakistani policymakers have been facing a variety of challenges, majorly including inflationary pressures, unemployment, and fluctuating growth of GDP. The two highly important weapons in the toolbox of policy tools are monetary and fiscal policies, which are used by central bank and government respectively to steer the economy towards economic expansion and stability.

Fiscal policy encompasses a series of measures aimed at managing public finances, stimulating aggregate demand, as well as fostering the country's socio-economic development. In Pakistan, main tools of fiscal policy include government spending, taxation and public debt management. Historically, government spending has been playing an important role in promoting infrastructural development, social welfare programs, and investment initiatives that aim to boost economic growth and alleviate poverty. However, the effectiveness of fiscal policy in Pakistan has been hampered by concerns about fiscal sustainability, poor resource allocation, and difficulties in revenue mobilization. Monetary policy, on the other hand, is the sole responsibility of the State Bank of Pakistan and is concerned with managing the money supply, interest rates, and credit conditions in order to ensure price stability, exchange rate management as well as financial sector stability. The SBP uses various monetary policy instruments, including discount rate, open market operations and reserve requirements to affect the credit and money supply in the economy. In Pakistan, the central bank's efforts to ensure price stability and reduce inflationary pressures have often crossed with broader macroeconomic goals such as increasing export competitiveness, encouraging foreign investment, and protecting foreign reserves. Ensuring price stability and economic growth is governments' ultimate goal (Mankiw, 2012). Therefore, macroeconomic policies are used by governments to achieve economic growth accompanied with lower inflation. A careful amalgamation of both policies is imperative to boost the momentum of economic activity. However, their potent coordination is crucial to manage economic fluctuations (Agha and Khan, 2006). Therefore, policy makers have to determine how such policies are to be framed in order to bring out their effective results.

The body of research, particularly from the 1980s onwards demonstrates how important monetary and fiscal policies are in determining how countries around the world perform to achieve their macroeconomic outcomes. Monetarists are proponents of monetary policy while, Keynesians contend that fiscal policy is a more effective strategy to enhance the economic activity. In this connection, notable contributions from Friedman (1982) and Bernanke and Gertler (1995) have highlighted the complexities of monetary policy and its effects on output and inflation, while Barro (1990) and Romer and Romer (2004) have emphasized the importance of fiscal policy in influencing the economy.

In Pakistan, with the passage of time, the nature and scope of fiscal and monetary policies have changed, reflecting the varying priorities and ideologies as well as external pressures faced by each successive government. In the initial years after the independence, Pakistan's fiscal policy remained highly focused on nation-building efforts backed by special attention on infrastructural development, industrialization as well as agricultural reforms. The pioneering works of Haq (1971) highlighted the significance of fiscal interventions in promoting the economic growth and social equity. However, as Khan (1987) illustrated, the decade of 1970s saw a change towards more expansionary fiscal policies, characterized by rising government spending and public debt. According to Pasha (1995) and Husain (2012), the decades of 1980s and 1990s witnessed a sequence of economic reforms aimed at trade liberalization, privatization of state-owned enterprises, and public expenditure rationalization. Kemal et al (2017) highlighted that fiscal consolidation initiatives gained good momentum, despite obstacles related to fiscal deficits as well as revenue mobilization in the country. The decade of 2000s witnessed a greater focus on fiscal discipline and public sector governance that was backed by more efforts to improve government revenue collection and rationalize expenditures as highlighted by Ahmad and Wajid (2013). Similarly, monetary policy framework in Pakistan has also changed over time particularly in response to changing policy objective as well as economic conditions. In the early years, the policy was more inclined towards credit allocation and lending to priority sectors of the country. Ahmed (1990) reported that during the decades of 1980s and 1990s, more efforts were made to modernize monetary policy instruments and to enhance central bank's independence. The State Bank of Pakistan (SBP) took a more aggressive approach to price stability and the development of the financial sector in the 2000s, as noted by Khan and Qayyum (2007). This was a move towards inflation targeting and exchange rate management regimes. However, problems such as exchange rate volatility, inflationary pressures, and external imbalances persisted, which led to continuous improvements in monetary policy frameworks. Hence, the interplay between fiscal and monetary policies, throughout this journey, has remained a central concern with policymakers steering the weaken balance between fiscal stimulus and monetary management.

Brief Historical Perspective Pertaining to Fiscal and Monetary Policies

During the decades of 1970s and 1980s, the Government expenditure was found relatively low due to smaller volume of economy as well as limited fiscal capacity. It has been observed that the major increases in expenditure occurred due to non-developmental expenditures particularly military spending and due to development projects. Decade of 1990s witnessed a gradual increase in expenditures backed by economic growth and development requirements in the country. In 2000s, government spending increased significantly particularly onwards 2001 mainly because of global economic conditions and national policies. Debt servicing and inflation have been two of the major issues in Pakistan over time, which caused expenditures more enlarged during the decades of 2010s and 2020s. To manage such problems and to meet the needs of so many development projects, tax revenue, though increased but not always in the same proportion as the expenditures. Fiscal response therefore has remained always be needed to perform efficiently and effectively. Similarly, trends in interest rates and money supply reflect the economic conditions as well as policy changes with respect to time. During the decades of 1970s and 1980s, the country was economically instable with higher inflation rate. Interest rates were therefore set to be higher generally. Variations in the interest rates during 1990s reflect the phases of economic liberalization and efforts for economic stability. Interest rates in 2000s are recorded as relatively stable as the economy witnessed a little growth but the fluctuation occurred mainly due to global economic conditions. Global financial crisis and domestic economic conditions in 2010s and 2020s were the main factors for significantly changing pattern of interest rates. Money supply (M2) has gradually increased during 1908s as the economy was growing which has further been accelerated because of the expansion in financial sector during 1990s. Onwards 2000s, a sharp increase in the level of money supply reflects the economic growth and changes in monetary policy. Inflation rate (CPI) during 1980s as compared to previous decade, inflation is recorded high particularly because of instable economy, oil shocks and domestic economic policies. During 1990s, some economic reforms as well as liberalization brought moderation in the rates of inflation and GDP growth. During 2000s, inflation rate spiked particularly because of global economic crises. However, the economy enjoyed relatively high GDP growth rates, specifically in the mid of this decade followed by a slow down due to massive economic challenges in the next decades of 2010s and 2020s. Severe economic pressures and frequent changes in policy along with other economic and political conditions also kept inflation higher during these both decades. During 1980s exchange rates have remained relatively stable, although there have been instances of devaluation. During 1990s, rupee depreciation took place that was because of prevailed economic conditions and changes in policy. The decade of 2000s witnessed a gradual deprecation backed by periodic stability. However, significant deprecation is recorded during 2010s and 2020s which reflects the severe economic pressures. Data used in this section is mainly sourced from Economic Survey of Pakistan (Various Issues), Statistical Handbook of SBP and World Development Indicator, 2019.

Since 1980s, Pakistan has experienced a variety of economic possibilities and challenges, which have forced policymakers to adjust their plans according to the changing domestic and international environments. The effectiveness of both policies in resolving macroeconomic concerns has become a focus of researchers as the country worked out economic reforms, faced external shocks, and changes in the global economic order. Researchers (e.g., Khan et al. 2021; Ahmed et al. 2020) have provided important insights into the effects of policy decisions by looking into specific challenges that Pakistan's economy faces. To fully comprehend the dynamic interplay between fiscal and monetary policy within Pakistan's particular economic framework, there is still a significant research gap. By offering a comprehensive and empirical analysis of how these policies interact and collectively affect important macroeconomic indicators, this study is an attempt to close this knowledge gap. As the world stands at the verge of an advanced economic period particularly in 2024 that is marked by extraordinary global challenges and novel opportunities, it is therefore critical to reevaluate and reassess the efficiency of fiscal and monetary policies in the context of Pakistan. By examining the policies implemented over the period of time and by using useful econometric models, this study aims to provide empirical insights that will not only add to the body of knowledge but also offer practical recommendations to policymakers who are faced with managing the intricate the country’s macroeconomic conditions. To achieve this, this study examines both fiscal and monetary policies that have been put into place over the last few decades and make use of needful econometric models.

Review of Literature

Over several decades, numerous theoretical frameworks, empirical research studies, and various policy debates have been conducted about the effectiveness of fiscal and monetary policies particularly in influencing macroeconomic outcomes. Researchers have consistently worked to clarify the complexities of these policies and their influence on economic dynamics, not only internationally but also in the particular context of Pakistan, starting with the seminal study of the 1980s and continuing with contemporary studies.

Fiscal Policy Effectiveness

Effectiveness of fiscal policy in terms of economic stability has been a continuous subject of extensive research since 1980s. In this connection, researchers (e.g., Barro, 1989; Romer & Romer, 2004) have highlighted the significance of considering the timing, composition as well as credibility of fiscal policy measures for the achievement of the

desired policy objectives. In the context of Pakistan, empirical studies (e.g., Agha & Khan, 2006; Ashraf et al., 2021; Arby & Hanif, 2010; Javid et al., 2008) have emphasized how government spending and taxation policies affect the GDP growth and employment. Fiscal authority aims to manage economic fluctuations through policy actions. For instance, when the economy experiences recessionary gap, it requires fiscal authority to stimulate the economy through increasing government spending and/or lesser taxes[1] (Jhingan, 2004). Keynes and his followers accredited fiscal policy for stabilizing and balancing role subject to optimal allocation of resources. However, the optimal resources allocation according to Keynes (1936) can be ensured in mixed economy with dominant private and limited public sector intervention. In fact, fiscal authority normally favors to expand the economy particularly when it aims to win vote in elections but the authority cuts expenditures during the starting days of the government by taking care of the enlarging fiscal deficit and debt. In this discipline, researchers including (Ahmed & Alorbi, 2018; Mahmoudzadeh et al., 2013) stated that increased government spending my create crowding out which harms the economy and even brings inflationary pressure leading to fiscal deficit and lesser output in the long run (Shaheen, 2013). The authority therefore has to be optimal in its decisions. When an economy is in a slump, it necessitates expansive fiscal policy (Jhingan, 2004). Other researchers such as (Coric et al., 2015 and Sen & Kaya, 2015) among others revealed that expansive fiscal policy boosts aggregate demand leading to increased aggregate output particularly when the economy is in recession. Whereas researchers such as (Baum et al., 2012; Rafiq, 2012) found contractionary fiscal policy harmful for the country's growth during the period of recession. This is therefore essential to examine the effectiveness of fiscal actions in terms of economic activity. However, it is not just the fiscal policy alone, monetary policy also performs an imperative role in the achievement of economic solvency. Both policies work as strategic substitutes of each other (Wyplosz, 1999) and have an essential role in the accomplishment of the policy goals backed by their efforts jointly (Sim, 1994, Purnamawati, 2014). These policies in this way interact to achieve improved as well as effective results. Moreover, fiscal policy, according to Mangla and Hyder (2017) received special attention after the global financial crisis when there was a dire need to overcome the recessionary situation. Executing appropriate fiscal policy is essential especially in case of economies where institutes develop slowly. The primary aims of fiscal policy particularly in developing countries are to ensure fair income distribution and redirect inefficient resources to efficient utilization (Popa & Codreanu, 2010). When it comes to the interplay of both policies, a debate emerges about how fiscal policy responds to economic fluctuations in collation with monetary authority and how monetary policy takes policy actions in a joint effort with fiscal authority. This is the main concern of the present study in case of Pakistan.

Monetary Policy Effectiveness

The main concern of monetary policy is to keep inflation under control while promoting economic activity (Noman & Khudri, 2015). This policy, primarily administered by central banks, operates through various transmission channels to impact economic variables such as inflation, output, and interest rates. The works of Friedman (1982) and Bernanke and Gertler (1995) have elucidated the mechanisms through which changes in the money supply affect economic activity, with implications for price stability and employment. In case of Pakistan, researchers such as Khan et al., (2023) and Hussain et al., (2022) among others have examined the effectiveness of monetary policy tools, including interest rate adjustments and open market operations, in managing inflationary pressures and stabilizing financial markets. Monetary policy makers as well as researchers in Pakistan are becoming increasingly concerned about the country's persistently rising inflation rates. Determining the extent to which changes in the monetary policy instruments can affect Pakistan's inflation rates has always been more crucial. In order to secure long-term growth, the SBP is concentrating more on anti-inflationary policies (Akhtar, 2007). SBP therefore should pursue and maintain a healthy mechanism to achieve the goal of price stability backed by economic growth (Ahmed & Malik, 2011). However, the central bank's decisions are closely linked with the decisions of fiscal authority in Pakistan. Fiscal domination makes it difficult for the central bank to implement a prudent monetary policy, especially when it aims to achieve price stability (Sherani, 2006). When trying to manage inflationary pressures, the monetary authority's power to raise interest rates is limited by the government's precarious financial situation. This is therefore a matter of concern to keep the interplay of both policies in view when it comes to evaluate the dynamics of each policy.

Interaction between Fiscal and Monetary Policies

Economists' interest in the dynamic interplay between fiscal and monetary policy has grown. Earlier studies such as Blinder and Solow (1973) and Christiano et al. (1999) have explored the potential complementarities or conflicts between both policies and their implications for macroeconomic stability. In Pakistan's context, researchers (e.g., Andlib et al., 2012; Arby & Hanif, 2010; Hina & Abbasi, 2021; Nasir et al., 2010; Shahid et al., 2017) investigated the coordination and effectiveness of both policies and found more evidences about the lack of coordination and effective interplay between both policies. Central banks, on one side worry about inflation and governments on the other hand worry

[1] Taxation and government spending are the powerful tools of fiscal policy (Mankiw, 2009).

about cyclical conditions and debt issue. To fulfill the intentions of both, it depends up on how properly these policies are in coordination. This necessitates the interdependence of both policies on each other where their interplay affects the respective policy goals jointly.

Research Gap

Although the extant literature provides useful insights into the separate effects of fiscal and monetary policy, there is still a study vacuum in fully comprehending their dynamic interplay in the context of Pakistan. By empirically examining the combined effects of fiscal and monetary policies on important macroeconomic indicators such as GDP growth, inflation, debt, unemployment and exchange rates, this study aims to close this knowledge gap and contributes to the country's ongoing policy discussion.

Problem Statement

Pakistan's macroeconomic stability has long been influenced by the dynamic interaction between fiscal and monetary policies. However, the effectiveness and relative performance of these policies, when simultaneously applied, have not been studied adequately in Pakistan's context. While both policies are useful strategies to manage inflation, GDP growth, debt, unemployment and exchange rate, their coordination and interplay can often create conflicting results. Especially, lacking harmonization between fiscal deficits and monetary tightening can worsen status of inflation, deteriorate exchange rates, and lead to unsustainable levels of debt. In spite of the vital importance of such policy interactions, limited research studies exist which empirically evaluate their collective impact on Pakistan's macroeconomic conditions over an extended time period. Given the interdependencies and complexities between both policies, it is important to examine their joint impact and develop insights that can guide policymakers when they aim to address inflationary pressures, manage issues of economic growth, handle debt problem, treat unemployment and stabilize exchange rates. This study therefore aims to fill this gap to analyze the dynamic interaction between both policies, thereby providing a comprehensive understanding of their combined and relative effects in terms of Pakistan's macroeconomic stability.

Objectives of the Study

1. To evaluate how the interaction between fiscal and monetary policies affects key macroeconomic variables in Pakistan
2. To quantify the relative contributions of fiscal and monetary policies in terms of Pakistan's macroeconomic stability
3. To develop evidence-based policy recommendations aimed at improving the coordination and effectiveness of fiscal and monetary policies in order to achieve macroeconomic stability and sustainable growth in Pakistan.

Significance of the Study

The present study offers critical insights into the dynamic interplay between monetary and fiscal policies and their impact on Pakistan's macroeconomic performance. By analyzing the collective impact of both policies, the research unveils valuable empirical evidence on how important macroeconomic variables in economy respond to fiscal and monetary policy shocks. The findings are significant particularly for policymakers in Pakistan which provide critical insights for government and monetary authorities to harmonize their action for better effective economic outcomes. In this connection, the study emphasizes the need for healthy coordinated policy efforts and recommends that the concerned authorities should work closely to align interest rate setting and fiscal decisions. This study is important not only for academic researchers but also for economists, policymakers as well as for financial institutions aiming to optimize both fiscal and monetary policies for sustained economic growth and stability.

Data and Variables

Data consists of yearly time series observations of Pakistan from 1980 to 2023 which is sufficiently a long period to capture various economic cycles and policy changes in the country. International Financial Statistics (IFS), World Bank's Data Bank, World Development Indicators (WDI), the State Bank of Pakistan (SBP) and similarly Economic Survey of Pakistan are the major data sources. Budget deficit as a percent of GDP is used as fiscal policy variable while interest rate (policy rate) is taken as variable to represent monetary policy. Real GDP growth rate represents the economic activity here. Consumer price index (CPI), a widely used indicator for inflation is used to observe the objective of price stability. Debt to GDP ratio is considered which has a significant importance in the models particularly when it is aimed to evaluate the fiscal and monetary policy effects in terms of economic stability. Nominal exchange rate of Pakistan's rupee against US dollar is used in the model. Central banks often target inflation which affects unemployment whereas fiscal measures, such as government spending, have a direct impact on employment levels. It is well supported by empirical studies that tight monetary policies often lead to an increase in unemployment, whereas expansionary fiscal policy helps to lower unemployment by boosting aggregate demand and encouraging businesses to hire more workers. Monetary tightening is typically used to control inflation by rising interest rates which turns borrowing more expansive, leads to decrease consumer spending as well as investments by businesses. This leads to reduce demand for labor which hence causes unemployment. Variable unemployment is therefore considered to

enrich the analysis. This study adopts a one-lag specification during estimation by keeping the appropriateness of policy analysis in view. This choice reflects the natural inertia which exists in policy decisions because the effects of policy measures require time to materialize. Use of one lag model therefore allows capturing the delayed impact effectively in the used model.

Econometric Model and Methodology

Due to their simultaneous adoption, both policies form an interactive behaviour. To evaluate how their interaction affects the key macroeconomic variables such as GDP, inflation, debt, unemployment and exchange rates in case of Pakistan and to capture the dynamic relationship between these policies and macroeconomic variables, this study employs Vector Autoregressive (VAR) model.

Vector Autoregressive (VAR) Model

To capture the dynamic interactions between fiscal and monetary policies and their impact on macroeconomic variables, a VAR model is used with the following specification;

$$\boldsymbol{Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots\ldots + A_p Y_{t-p} + B_1 X_{t-1} + B_2 X_{t-2} + \ldots\ldots + B_q X_{t-q} + \varepsilon_t}$$

Where:

- Y_t represents a vector of macroeconomic variables (in this case, GDP growth rate, inflation rate, debt to GDP ratio, unemployment rate and exchange rate)
- X_t reprsents a vector of policy variables (in this case, interest rate (policy rate) and budget deficit as a percentage of GDP)
- $A_1, A_2 \ldots\ldots A_p \; and \; B_1, B_2 \ldots\ldots B_q$ are the coefficient matrices.
- ε_t is the vector of white noise errors.

It is intended that the impacts of both policies on the corresponding dependent variable be examined through policy variables as well as control variables. To obtain the meaningful results, several models would have to be created and then estimated independently. The literature in such case suggests running a mechanism having separate equations through an established system. Modeling VAR, according to Dungey and Paggan (2009) is a well-known technique to properly identify the dynamic relationship among the multivariate series. Impulse response functions (IRF) and variance decompositions (VDs) are the useful tools used by VAR which help in providing additional information related to the effects as well as transmission of shocks and policy innovations (Van Aarle et al., 2003). VD is used to separate the variation in the variables under consideration into components and to present information about the relative contributions of every random innovation affecting the variables in the VAR. IRFs are so used to analyze the duration of the effect and to determine the sign of the resulting impact. While estimating the policy effectiveness, IRFs and VDs are used by numerous researchers for instance (Boon & Zubaidi, 1999; Khalid et al., 2007; Nasir et al., 2010; Mahmood and Sial, 2021) among others. Before the estimation, choosing the maximum lag length using appropriate techniques is required. For this, Likelihood Ratio (LR) test, Akaike Information (AIC), Schwartz Bayesian (SBC) and the Hannan Quinn (HQ) criteria are used. Reliable IRFs and VDs require a stable VAR model. The model's stability is therefore checked through plotting the roots of the characteristic polynomial. The extensively used Augmented Dickey Fuller (ADF) and Phillips-Peron (PP) tests are used for unit root testing to ensure valid results of the VAR model. The test equations of ADF and PP tests are given respectively as;

$$\Delta Y_t = \alpha + \delta t + \gamma Y_{t-1} + \beta \sum_{i=1}^{p} \Delta Y_{t-1} + \varepsilon_t \ldots\ldots\ldots \quad \ldots\ldots\ldots \quad \ldots\ldots (2)$$

$$Y_t = \acute{\alpha}_o + \acute{\alpha}_1 y_{t-1} + \acute{\alpha}_2 (t\text{-}T/2) + \acute{\varepsilon}_t \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Results and Discussion

Table 1 presents the results of unit root tests. It is evident that all variables are non-stationary at their conventional level of significance except GDP. These are reverted to stationarity by their first differences which appeared significant at 5%. The results of the unit root tests allow employing VAR analysis.

Table 1: Result of Unit Root

Variables	ADF (Drift and Trend)		PP (Drift and Trend)		Order
	Level	1st Difference	Level	1st Difference	
Interest rate	0.76	0.0005*	0.64	0.0005*	I(1)
Budget deficit	0.22	0.0000*	0.22	0.0000*	I(1)

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GDP growth rate	0.0006*	-	0.0006*	-	I(0)
Inflation rate	0.90	0.0000*	0.81	0.0000*	I(1)
Debt to GDP ratio	0.24	0.0006*	0.62	0.0006*	I(1)
Unemployment rate	0.62	0.07**	0.80	0.0000*	I(1)
Exchange rate	0.47	0.03*	0.81	0.03*	I(1)

*shows significance at 5% and ** at 10%, indicating the rejection of null hypothesis respectively

As the aim is to capture the interaction between fiscal and monetary policies, Lag 1 is more suitable choice for the analysis of VAR, as it balances model complexity with predictive accuracy, and is supported by LR test (Table 2). While the majority of the criteria such as AIC, SC and HQ favor Lag 0 model but LR test strongly suggests that including one lag improves the model fit significantly. Since economic relationships, particularly used in the current study, often exhibit delayed responses to policy changes which supports the inclusion of lags. Therefore, the LR test as suggesting significant improvement with Lag 1 is considered to get more accurate representation of the dynamic interactions among the study variables.

Table 2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-449.5987	NA	19.39220*	22.82994*	23.12549*	22.93680*
1	-405.3113	70.85984*	25.50012	23.06557	25.43000	23.92047
2	-375.4778	37.29191	83.75977	24.02389	28.45720	25.62684

Asterisk (*) indicating lag order selected by the criterion

The presence of autocorrelation is checked through the LM test. The model is free from autocorrelation as revealed by Table 3.

Table 3: Autocorrelation Test in VAR

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	47.21676	49	0.5457	0.952713	(49, 111.0)	0.5663
2	28.08886	49	0.9929	0.526125	(49, 111.0)	0.9935

To empirically examine the interactive performance of fiscal and monetary policies in affecting the key macroeconomic variables, this study estimates VAR model consists of seven variables. Detailed results are given in Appendix (table 5A). The strength of policies' effectiveness depends on how both policies affect the macroeconomic variables which are ultimately targeted by fiscal and monetary authorities. This estimation reflects how policy decisions respond to the concerned endogenous variables within the VAR framework. When the estimated relationships amongst the endogenous variables in the VAR are gathered, it properly determines that how the shocks are transmitted into the concerned model (Van Aarle et al., 2003)

Initial results of estimated VAR help to understand the immediate effects within the system which reveals that interest rates (monetary policy instrument) negatively affects the real GDP growth (-0.33), though the value of t-stat is -1.94 which suggests borderline significance. It means that higher interest rate from the past period leads to reduce economic growth. The result is aligned with the conventional macroeconomic theory where tight monetary policy slows down the economy. It argues that the higher interest rates increase the cost of borrowing, lead to reduce consumption and investment, and thereby tend to decrease GDP growth in the short run. Similarly, budget deficit (indicator for fiscal policy) also has a negative coefficient which reveals that fiscal imbalances may hinder growth. The coefficient for the impact of budget deficit on GDP growth is negative (-0.02) but insignificant statistically (-0.08). This suggests that higher deficits in previous periods tend to have a negative effect on growth, but this impact is not statistically robust. Fiscal policy theory suggests that budget deficit could either stimulate or hinder growth which depends on the circumstances. For instance, Keynesian theory believes that deficit spending in terms of increased government expenditure stimulate growth by boosting aggregate demand, especially when the economy is in recession. Conversely, neoclassical theories argue that persistent budget deficits lead to higher interest rates (through crowding out private investment), inflation as well as unsustainable debt which ultimately make the growth slower. VAR model offers two powerful tools that are impulse responses and variance decompositions. They both derived out from VAR are so used to investigate the policies empirically for their effectiveness in Pakistan's macroeconomic performance. IRFs are estimated over the period of ten years to demonstrate the reactions of the study variables to one-standard-deviation shocks in both policies. Similarly VD is used to investigate the respective magnitudes associated to

random innovations of both policies in affecting VAR's endogenous variables. But a stable VAR model is essential for reliable IRFs and VD. Figure 1 and table 4 confirm that the model is stable.

Table 4 AR Roots

Root	Modulus
0.263652 - 0.402658i	0.481296
0.263652 + 0.402658i	0.481296
0.404411	0.404411
-0.303459	0.303459
-0.237489 - 0.171380i	0.292869
-0.237489 + 0.171380i	0.292869
0.238136	0.238136
No root lies outside the unit circle.	
VAR satisfies the stability condition.	

Figure 1 ***AR Roots***

Impulse Response Functions

Figures 2 and 3 present the visual representations of the responses through graphs of IRFs for monetary and fiscal policies respectively. Smooth line shows the effects either positive or negative while dotted one show the standard error confidence bands to know significance or insignificance. Complete estimated results of IRFs are given in Appendix (tables 6A and 7A)

Impulse Response Function (Monetary Policy)

The starting pane of schematic presentation (Figure 2) demonstrates that a one standard deviation shock on interest rate leads to gradual negative effect on GDP growth rate. It implies that monetary policy by changing the rate of interest exerts a negative effect on growth. Effect reaches to its maximum at the third year that then moves down gradually, dies down to zero in the fifth year and then turns positive but that is statistically insignificant. Result illustrates that the effect is marginally significant in statistical terms as the positive standard error band is not significantly distinct from zero particularly in initial years as compared this to lower band which moves more away from zero. Simply, the upper band's tendency is relatively more near to zero line than the lower one. Result reveals that the effect of interest rate on growth is relatively high and marginally significant till third period thereafter it turns positive but insignificant that captures the long run effect. The results align with monetary theory that growth is influences by monetary policy in short also in medium terms (Mishkin, 2003, 2011). With this, it can be concluded that there prevail a marginally significant negative effect of interest rate on growth. This means that growth pursues its usual behavior in consistency with economic theory. This is also aligned with the findings of (Zahid, 2018; Shah et al., 2021). Hence, by following interest rate shock, GDP exhibits a negative response initially but starts to recover over time where the economy moves to stabilize after initial disruptions. This means that contractionary monetary policy as consistent with the theory has a dampening impact on growth in Pakistan particularly in the short run. Theoretically, a tight monetary policy stance leads to raise banks' lending rates which reduce investment demand that then lowers the aggregate demand in economy and affects growth. This can be presented as;

$$interest\ rate \uparrow \rightarrow Investment \downarrow \rightarrow Aggregate\ Demand \downarrow \rightarrow Grwoth \downarrow$$

Next important panel of Figure 2 presents that a shock on the interest rate has a positive effect on inflation in initial phases which dies out to zero in the second period. This align with the studies of (Sims, 1992; Barth and Ramey, 2001; Castelnuovo and Surico, 2010) and (Javid and Munir, 2010; Ishaq and Ejaz, 2021) in case of Pakistan who argued that Pakistan experiences the phenomenon of price puzzle which makes monetary policy less effective in the matter of inflation control. However, a rise in interest rates should theoretically result in higher bank lending rates. Since private investment is thought to has interest rate sensitivity, there would therefore be less demand for it overall, which would hence reduce aggregate demand in economy. Now, even though it will take some lags, this action will generally lower inflation if it is dependent on lagging output demand. This can be presented as;

$$interest\ rate \uparrow \rightarrow Investment \downarrow \rightarrow Aggregate\ Demand \downarrow \rightarrow Inflation \downarrow$$

The same is reflected in the resultant panel where after the second period, inflation tends below the zero line which shows a decline of inflation with contractionary monetary policy though after few lags. Hence, IRF's findings are interesting in terms of supporting the decision of the State Bank of Pakistan regarding the adoption of flexible inflation targeting by the year 2020, rather than depending on monetary aggregate. Furthermore, unemployment rises following a contractionary monetary policy as the higher cost of borrowing slows down business activities where businesses face a reduced access to affordable capital. This leads to increasing unemployment particularly in the short run. Moreover, budget deficit shows declining move initially which drops to zero line in the second period. It indicates that contractionary monetary policy leads to tighter fiscal conditions. This can be due to higher costs of borrowing which force the government to either decrease spending or to improve fiscal discipline. As in Pakistan, there is high reliance on external as well as domestic borrowing; interest rate hike can therefore increase the cost of debt servicing which often leads to fiscal discipline.

Next panel shows the exchange rate depreciation immediately after the shock on interest rate for a shorter period which tends to diminish over time and reaches to zero in the fourth period. The effect then turns negative for three periods and converts to zero line then which sustains on zero line till tenth period. The positive effect is significant in initial short period of two periods which turns insignificant in the region where the effect is no longer positive. The Mundell-Fleming model predicts the exchange rate appreciation in response to a higher interest rate, as capital inflows increase demand for the domestic currency. However, in case of Pakistan, dynamics of exchange rates are also influenced by external factors like trade imbalances and remittances, which justify the eventual leveling-off of the appreciation. Moreover, the positive response of the exchange rate in initial periods indicates the structural weakness and external vulnerabilities which dominate the ultimate impact of interest rate changes. The concerns about fiscal stability, inflation expectations, high external debt burden and political instability can cause capital flight or investors' reluctance to hold domestic assets which in turn leads exchange rate to depreciate. The result collaborates earlier findings of (Malik, 2007; Shaheen, 2013).

Impulse Response Function Of Fiscal Policy

First panel of schematic presentation (Figure 3) reveals that initially, the response of GDP growth to an increased budget deficit is marginally positive which shows that an increased deficit (fiscal expansion) boosts the short term growth. This is aligned with the Keynesian theory where government spending can stimulate demand specifically in economy with slack. The impact turns negative and marginally significant immediately which reaches to its maximum in the second period and dies out to zero in the third period. After that, the impact is positive but insignificant for a period of three years which then sustains on zero line till the tenth year. This implies that an increase in the budget deficit dampens GDP growth in the short term. Same findings are drawn by Chaudhry (2018). This implies that the initial fiscal stimulus may be unsustainable, probably due to rising debt burdens or even crowding-out effects in the private sector. Because, the government normally finances deficits through borrowing leading to increased debt servicing costs as well as less productive investment. The same is also evident in the studies of Ahmed & Miller (2000), Iqbal et al (2017), Chaudhry (2018) in case of Pakistan. Hence, while fiscal expansion promotes short-term growth, the diminishing effects indicate potential risks to the long-term economic stability, particularly in economies like Pakistan facing significant fiscal constraints. Result aligns the findings of Khalid et al. (2007).

Next panel demonstrates that budget deficit initially leads to a positive effect on short run inflation which means that increasing budget deficit put upward pressure on inflation through increased demand. The positive effect is gradually decreasing which immediately dies out to zero during the second period and turns negative after that for a period of 2 years. However, the slightly negative effect has no significance in statistical terms. Negative effect dies out to zero in third period and then turns slightly positive which continues with marginal significance on the zero line for the rest of the years. Such mixed response suggests that Pakistan's deficits are causing weak inflationary pressures, which may be reflected in weak demand pull inflation. In such circumstances, fiscal policy seems unsuccessful strategy in control of inflation which can be attributed majorly to

different economic shocks taken place in Pakistan over time[2]. The result matches the findings of (Khalid et al., 2007; Shahid et al., 2017). The argument too supports the views of Javid et al., (2008) and is also consistent with the quantity theory of money, as inflation channel attributes to fiscal policy mainly in a case when it operates under the regime of fiscal dominancy, where it does not allow accommodating or adjusting deficits to maintain any fiscal solvency. In such case, the monetary authority as body for anti-inflationary strategy even actively operates; however, Favero (2003) stated that it leads to inflation in economy. It implies that healthier interactive coordination between both policies cannot be ignored. Moreover, the budget deficit's effect on debt is initially positive for a short run indicating a rise in debt due to increasing budget deficit. The effect turns negative in the second period with immediate convergence towards zero line in the same period. With a slight positive effect for a shorter period, the effect continues on the zero line with marginal significance till tenth year. The mix responses in this scheme of IRF do not demonstrate a meaningful result because of its insignificance in statistical terms particularly in most of the response periods. The result can be attributed to an ineffective fiscal stance in terms of Pakistan's debt management. Furthermore, the unemployment rate reveals a positive and significant response to budget deficit in the initial period, implying that increasing fiscal deficit initially boosts unemployment. However, in the second period the effect turns to negative which reaches to its maximum in the same period and starts convergence towards zero line immediately. This shows that increasing fiscal deficit initially helps to reduce unemployment that is typical in Keynesian policies of fiscal stimulus. However, the effect diminishes over time which demonstrates only short term gains. This is in line with the findings of Kalim and Hassan (2013). Moreover, in the third period, the effect is again positive leading towards negative in the fourth year. During and onwards fifth year, the effect sustains on zero line till tenth year with marginal significance. Shock on budget deficit exerts a positive effect on exchange rate but the effect is insignificant statistically. Increasing budget deficit rises the exchange rate but at smaller amount. Depreciation of exchange rate with increasing budget deficit is due to twin deficit. In this connection, (Rehman & Saeed, 2017: Mukhtar et al., 2007; Aqeel et al., 2000; Faizul, 1998) among others who revealed that mounting budget deficit is an important determinant to increase current account deficit which leads to phenomenon of twin deficit. IRF shows that the effect turns negative in the second period for a shorter period and reverts to zero line at the end of the fourth year which then continues on zero line with marginal significance till tenth period. This means that fiscal policy has least efficiency to manage exchange rate. Theoretically, in developing countries particularly, the governments spend on diverse developmental works though under the pressure of massive budget deficits. It makes borrowing necessary for them which results in enlarged monetary base. Hence, monetary authority employs loose monetary stance by reducing interest rate leading to discouragement of foreign investment. This leads to reduce the volume of foreign reserves due to smaller capital inflow which consequently leads to increased exchange rate. This can be described as;

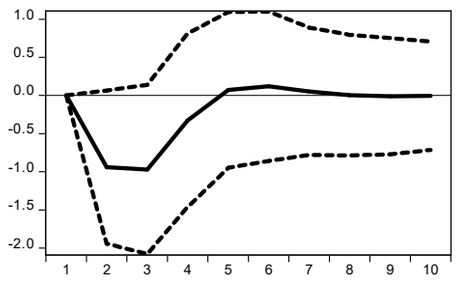
$$\textbf{Budget Deficit} \rightarrow \textbf{Govt browwing} \uparrow \rightarrow \textbf{Monetary base} \uparrow \rightarrow \textbf{Interest rate} \downarrow \rightarrow \textbf{Foreign investment} \downarrow \rightarrow \textbf{Capital inflow} \downarrow \rightarrow \textbf{Forex reserves} \downarrow \rightarrow \textbf{Exchange rate} \uparrow$$

It can be concluded form the IRFs that fiscal policy as indicated by budget deficit is less potent in its action because it does not affect any of the targeted variables significantly. Interest rate being instrument of monetary policy has significant effects on three out of seven targeted variables. The results are consistent with theoretical expectations that tight monetary policy tends to reduce inflation and growth while initially it increases unemployment and depreciates exchange rate. In the context of Pakistan, these findings reflect how interest rate increases affect fiscal discipline and macroeconomic stability while having negative short-term growth, unemployment and exchange rate effects. The similar findings are drawn by Shah et al., (2021) Pakistan's context. However, monetary tightening is useful to manage inflation after some lags while at the same time, fiscal expansion affects inflation positively. This shows that both policies work mostly in opposite direction so demanding mutual coordination immensely required. Hence, it is concluded from IRFs that monetary impulses have comparatively more leverage and highly dependable when compared to fiscal impulses.

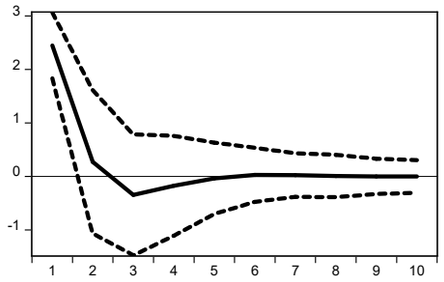
[2] Nationalization process of industries in Pakistan in seventies, persistent political instability, the earthquake and flood took place in 2005 and 2010 respectively.

Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E.

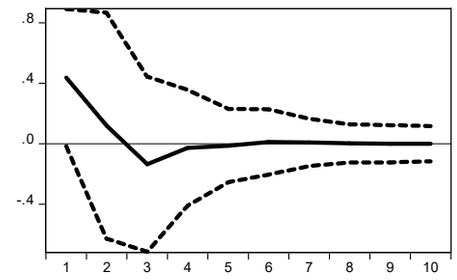
Response of Real GDP Growth Rate to Interest Rate



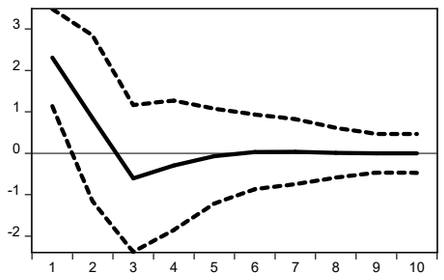
Response of Interest Rate to Interest Rate



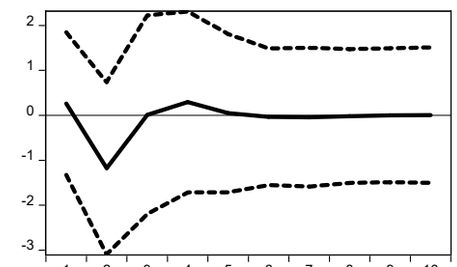
Response of Budget Deficit to Interest Rate



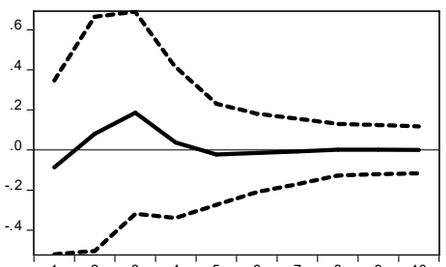
Response of Inflation Rate to Interest Rate



Response of Debt to GDP Ratio to Interest Rate



Response of Unemployment Rate to Interest Rate



Response of Exchange Rate to Interest Rate

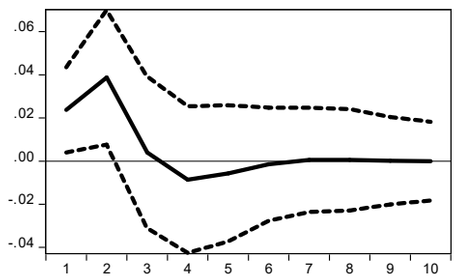


Figure 2 Monetary Policy's Impulse Responses

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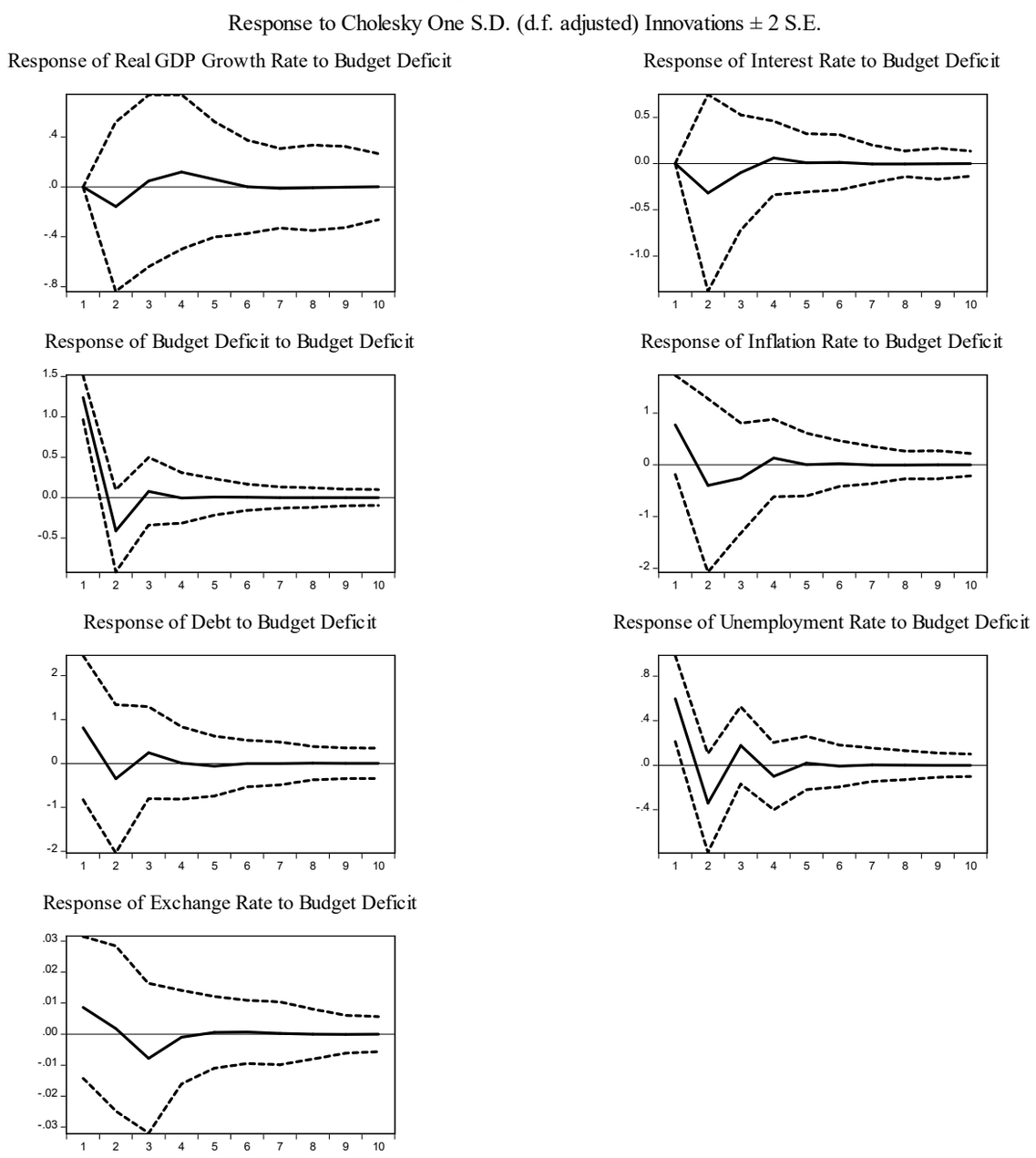

Figure 3: Fiscal Policy's Impulse Responses

Variance Decomposition (VD)

Finally, analysis of variance decomposition (VD) is carried out to determine the percentage portion of each variable's variability for quantifying the relative contributions of fiscal and monetary policies. This method provides valuable information about the relative efficacy of each random innovation in influencing the under study variables in the VAR system by separating the variation in endogenous variable into the respective component shocks to the VAR. Complete results of VDs are provided in Appendix (table 8A).

9.2.1 Variance decomposition of GDP Growth

Table 5 shows percent of the forecast error variance decomposition of GDP growth. It reveals that in the short run, the interest rate, in the second period explains 17.23% of the variation in GDP growth, while budget deficit explains less than 1% (0.48%) of the variation in GDP in the same period. Monetary policy's role in the short run is hence relatively more prominent than fiscal policy. This aligns with the findings of Khalid et al. (2007). In a long run, by considering the tenth year, 29.2% of the variation is explained by monetary while again less than 1% (0.7%) is explained by fiscal stance. It implies that in determining GDP growth, fiscal policy's role is less than 1% in both short also in long run, whereas monetary policy's role reaches up to 30% in the long run. This shows more explanatory power of monetary policy in terms of GDP growth of economy as compared to fiscal policy. The same is evident in IRFs. Similar findings were noted by (Qayyum and Manzoor, 2018; Shah et al., 2021; Soharwardi et al., 2022) among others.

Table 5: Variance Decomposition of GDP Growth

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.78	100	0	0	0	0	0	0
2	2.27	69.18	17.23	0.48	2.12	0.14	0.15	10.71
10	2.59	53.00	29.16	0.68	2.61	2.78	2.05	9.72

Variance Decomposition Of Inflation

Table 6 demonstrates that in the short run, the interest rate explains 35.8%, whereas, budget deficit explains 4.5% of the variation in inflation. While in the long term, monetary policy's role reaches to 37% while fiscal policy's role still remains below 5%. This implies that in determining inflation, monetary policy has relatively more explanatory power than fiscal stance in the matter of inflation control in the short also in the long run. Comparing the role of monetary policy in terms GDP, debt, unemployment and exchange rate, it is found that monetary policy is more potent to control inflation relatively. The result aligns with the findings of (Shahid et al., 2017; Hanif and Iqbal, 2016; Shah et al., 2021; Soharwardi et al., 2022).

Table 6: Variance Decomposition of Inflation

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.78	3.02	37.41	4.16	55.42	0	0	0
2	2.27	3.67	35.87	4.46	47.29	3.70	4.66	0.34
10	2.60	3.52	36.66	4.72	46.31	3.80	4.45	0.53

Variance Decomposition Of Debt

Table 7 presents that interest rate explains 6.3% of the variation in debt in the second period, whereas, in the same period, budget deficit's role is 3.4%. Monetary policy is comparatively more superior to fiscal policy in terms of debt management. However, fiscal policy's role in the long run approaches to 3.5% while monetary policy explains 6.5% of the variation in debt here. It implies that in the long run, monetary policy exerts more explanatory power in the matter of debt. Role of fiscal policy is relatively better in terms of debt; however, it is still not appreciable. Same is reported by impulse response functions and same aligns with the findings of Khalid et al., (2007).

Table 7: Variance Decomposition of Debt

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.78	0.02	0.35	3.36	5.04	91.23	0	0
2	2.27	1.24	6.29	3.38	4.38	82.86	0.45	1.39
10	2.59	1.53	6.48	3.54	4.50	81.34	0.59	2.02

Variance Decomposition of Unemployment

Table 8 demonstrates that interest rate explains 0.84% of the variation in unemployment in the second period, while in the same period; budget deficit's role is 28.4%. Fiscal policy is comparatively stronger strategy than monetary policy in the matter of unemployment in economy. Furthermore, in the long run, the role of fiscal policy approaches to 29.1% while monetary policy explains 2.9% of the variation in unemployment here. It implies that, fiscal policy exerts more explanatory power for unemployment management as compared to monetary policy. Comparing the role of fiscal policy in terms of GDP, inflation and debt, it is found that fiscal policy is relatively more competent in case of unemployment.

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Table 8: Variance Decomposition of Unemployment

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.78	4.79	0.54	25.58	7.38	0.06	61.65	0
2	2.27	4.36	0.84	28.38	6.51	1.20	57.59	1.13
10	2.59	4.14	2.86	29.06	6.22	1.40	55.23	1.08

Variance decomposition of Exchange Rate

Table 9 reveals that interest rate in the short run explains 14.6% of the variation in exchange rate that comes in the first period, while in the same period; budget deficit's role is 1.91%. Monetary policy has more potential than fiscal policy for exchange rate stability. In the long run, the role of monetary policy approaches to 32.1% while fiscal policy explains 2% of the variation in exchange rate here. It implies that, monetary policy exerts relatively more explanatory power both in the short also in the long run for exchange rate management than fiscal policy. This is aligned with the results of (Shah et al., 2021; Soharwardi et al., 2022).

Table 9: Variance Decomposition of Exchange Rate

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.78	4.46	14.61	1.91	1.17	12.23	0.84	64.78
2	2.27	3.02	33.48	1.24	1.19	15.09	3.85	42.12
10	2.59	2.86	32.07	2.04	2.88	17.10	4.80	38.25

Table 10 Variance Decomposition (Summary)

	GDP		Inflation		Debt		Unemployment		Exchange Rate	
Policy	**Short Run**	**Long Run**	**Short Run**	**Long Run**	**Short Run**	**Long Run**	**Short Run**	**Long Run**	**Short Run**	**Long Run**
Monetary Policy	17.2%	29.2%	35.9%	36.7%	6.3%	6.5%	0.8%	2.9%	14.6%	32.1%
Fiscal Policy	0.5%%	0.7%	4.5%	4.7%	3.4%	3.5%	28.4%	29.1%	1.9%	2.0%

Concluding Remarks on Variance Decomposition (VD)

Monetary policy has relatively more potential in determining the GDP, inflation, debt and exchange rate whereas fiscal policy is relatively powerful than monetary policy in case of unemployment. Monetary policy explains substantial portions of GDP and inflation variances in short also in long run while fiscal policy contributes significantly less to both variances in the short run also in the long run. This reflects the conventional view that in Pakistan, inflation is largely driven by monetary stance whereas fiscal policy plays relatively small role. This is in line with the arguments of Shah et al., (2021) who found both are the policies work for stability where growth and inflation are the prominent targets of the monetary authority in Pakistan. Furthermore, both policies have a small but considerable impact on debt management, with fiscal policy's role more pronounced to some extent. Effect of monetary policy on unemployment is negligible both in short and long runs. However, fiscal policy plays a major role in explaining a substantial proportion both in short and in long run and appears as a key driver of unemployment. As concerning the objectives of fiscal policy, debt and unemployment are relatively more central targets than inflation and exchange rate. In Pakistan, exchange rate is more sensitive to monetary policy adjustments such as interest rate, the influence of monetary policy is found stronger in both short run and long run as expected whereas the role of fiscal policy here is very minimal in short and long runs both. As compared to inflation, the performance of monetary policy is minor in terms of exchange rate which means that monetary policy is highly inclined towards its primary objectives given by Taylor (1993) while little conscious about exchange rate stabilization. However, comparing with monetary policy, the long run results of fiscal policy are weaker in all variables except unemployment but that is not the primary objective of monetary policy. It is hence concluded from variance decomposition that, overall, in affecting the Pakistan's macroeconomic landscape, monetary policy performs relatively stronger role than fiscal policy. Same is reported by impulse responses.

Conclusion

Fiscal and monetary policies are essential macroeconomic policies which work together. Their interaction therefore affects the country's economic activity. Both policies have been studies extensively; however, their relative performance in the presence of their dynamic interplay has not been tested that much. The present study therefore focuses on the dynamic interplay of both policies and evaluates their collective impact on Pakistan's macroeconomic stability. Utilizing the VAR model and analyzing the impulse response and variance decomposition, the present study provides valuable insights in to how the important macroeconomic variables like GDP growth, inflation, debt, unemployment and exchange rate respond to shocks in fiscal and monetary policies from 1980 to 2023. Monetary policy is measured through the interest rate (policy rate) and fiscal policy is represented by budget deficit as a percent of GDP. The strength of policies' effectiveness depends on how both policies influence the macroeconomic variables targeted by fiscal and monetary authorities. This study also tested the relative efficacy of both policies in terms of Pakistan's macroeconomic stability. The econometric methods reveal that higher interest rate from the past period leads to reduce economic growth. The result is aligned with the conventional macroeconomic theory where tight monetary policy slows down the economy. Similarly, higher budget deficits in previous periods have a negative effect on growth, but this impact is not statistically robust. Fiscal policy theory suggests that budget deficit could either stimulate or hinder growth which depends on the economic circumstances. The results supports the argument of neoclassical theorists that persistent budget deficits lead to higher interest rates (through crowding out private investment), inflation and likewise unsustainable debt which eventually make the growth slower. For additional information, the study uses Impulse Response Functions (IRF) and Variance Decomposition (VD) to empirically investigate both policies in terms of their effectiveness.

It is concluded form the IRFs that fiscal policy is less potent in its action as it does not affect any of the targeted variables significantly. While monetary policy has significant effects on three out of seven targeted variables. The results are consistent with theoretical expectations that tight monetary policy tends to reduce inflation and growth while initially it increases unemployment and depreciates exchange rate. Unemployment rises following a contractionary monetary policy particularly in the short run whereas, budget deficit declines initially which indicates that tight monetary policy leads to tighter fiscal conditions. Moreover, exchange rate is found to be depreciated for a shorter period with interest rate hike which diminishes over time and turns negative for a small period in the long run. The positive response of the exchange rate in initial periods shows structural weakness and external vulnerabilities dominating the ultimate impact of interest rate changes. The concerns about fiscal stability, inflation expectations, burden of external debt and political instability can cause capital flight or unwillingness of investor to hold domestic assets which tends exchange rate to depreciate. In the context of Pakistan, these findings reflect how interest rate increases affect fiscal discipline and macroeconomic stability while having negative short-term growth, unemployment and exchange rate effects. However, tight monetary policy is useful to manage inflation after some lags while fiscal expansion at the same time affects inflation positively. This shows that both policies work mostly in opposite direction hence demanding for mutual coordination that is important immensely. Further, interest rates' positive effect on inflation in initial phases confirms the existence of price puzzle making monetary policy less effective in controlling inflation. A decline in inflation with contractionary monetary policy is observed though after few lags. This is therefore interesting in terms of supporting the decision of the State Bank of Pakistan regarding the adoption of flexible inflation targeting by the year 2020, rather than depending on monetary aggregate. Hence, monetary impulses are found comparatively more influential and dependable as compared to fiscal policy's impulses.

Moreover, results of VDs reveal that monetary policy has relatively more potential in determining the GDP, inflation, debt and exchange rate whereas fiscal policy is relatively powerful than monetary policy in case of unemployment. Monetary policy explains substantial portions of GDP and inflation variances both in the short also in the long run while fiscal policy contributes significantly less to both variances in the short run also in the long run. This reflects the conventional view that in Pakistan, inflation is largely driven by monetary stance whereas fiscal policy plays relatively small role. Both policies have a small but considerable impact on debt, with fiscal policy's role more pronounced to some extent. Effect of monetary policy on unemployment is negligible both in short and long runs, whereas, fiscal policy is relatively stronger in such case both in short and long run and hence appears a key driver of unemployment. Monetary policy is found relatively stronger than fiscal policy in exchange rate stability. As compared to inflation, the performance of monetary policy is lesser in terms of exchange rate implying that monetary policy is more inclined towards its primary objectives and little conscious about exchange rate stabilization. Additionally, as compared to monetary, the long run results of fiscal policy are weaker in entire variables except unemployment though it is not the primary objective of monetary policy. Hence, it is concluded that, overall, in affecting the Pakistan's macroeconomic landscape, monetary policy performs relatively stronger role than fiscal policy. Based on the findings, the policy implications from this study directed specifically to fiscal and monetary policy advisers and makers suggest that (a) to ensure the policy harmonization between the authorities, the finance ministry should coordinate with the monetary authority particularly in setting the optimal

rate of interest, (b) monetary authority in Pakistan is in need to enhance its attention to stabilize exchange rate for the sake of preventing the economy from supply shock which may appear due to increased prices of production inputs and can lead to inflation in economy, (c) after confirming the relatively potent role of monetary policy, the study supports the autonomy of the State Bank in conducting the monetary policy to avoid the political influences and excessiveness of government intervention in the conduct of monetary policy, (d) accelerated interest rates boost the cost of doing business discouraging investors community which harms the volume of capital accumulation, level of output and eventually the country's economic growth. Therefore, the monetary authority should be more cautious in monetary tightening when it is aimed to manage inflation in economy.

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Appendix

Table 5A VAR Results

	GDP Growth	Interest Rate	Budget Deficit	Inflation Rate	Debt to GDP Ratio	Unemployment Rate	Exchange Rate
Real GDP Growth Rate (-1)	0.308935	0.211872	0.056204	0.366177	0.067807	-0.075740	0.007391
	(0.15887)	(0.22077)	(0.11809)	(0.33666)	(0.39450)	(0.10549)	(0.00554)
	[1.94462]	[0.95970]	[0.47595]	[1.08768]	[0.17188]	[-0.71801]	[1.33533]
Interest Rate (-1)	-0.325298	0.148741	0.214198	0.486679	-0.548374	0.035715	0.011169
	(0.16705)	(0.23214)	(0.12417)	(0.35400)	(0.41483)	(0.11092)	(0.00582)
	[-1.94730]	[0.64073]	[1.72501]	[1.37479]	[-1.32194]	[0.32199]	[1.91908]
Budget Deficit (-1)	-0.023929	-0.606792	-0.234522	-0.918547	-0.747316	-0.096595	-0.014169
	(0.29150)	(0.40508)	(0.21668)	(0.61772)	(0.72386)	(0.19355)	(0.01016)
	[-0.08209]	[-1.49795]	[-1.08236]	[-1.48699]	[-1.03241]	[-0.49907]	[-1.39515]
Inflation Rate (-1)	0.081325	0.134783	-0.123546	0.081505	0.090753	-0.019947	0.005695
	(0.11084)	(0.15403)	(0.08239)	(0.23489)	(0.27525)	(0.07360)	(0.00386)
	[0.73369]	[0.87502]	[-1.49947]	[0.34699]	[0.32971]	[-0.27102]	[1.47476]
Debt to GDP Ratio (-1)	0.057747	0.073294	-0.014089	0.205104	0.200604	-0.044717	0.003905
	(0.06678)	(0.09280)	(0.04964)	(0.14152)	(0.16583)	(0.04434)	(0.00233)
	[0.86471]	[0.78978]	[-0.28383]	[1.44931]	[1.20967]	[-1.00845]	[1.67825]
Unemployment Rate (-1)	-0.184210	0.521385	-0.014019	0.924007	0.416807	-0.321023	0.016717
	(0.29982)	(0.41664)	(0.22286)	(0.63535)	(0.74451)	(0.19907)	(0.01045)
	[-0.61441]	[1.25141]	[-0.06290]	[1.45433]	[0.55984]	[-1.61259]	[1.60036]
Exchange Rate (-1)	-14.83905	-4.733912	-0.661708	-4.814704	11.33411	2.743545	0.207173
	(5.16729)	(7.18075)	(3.84096)	(10.9502)	(12.8316)	(3.43101)	(0.18003)
	[-2.87173]	[-0.65925]	[-0.17228]	[-0.43969]	[0.88330]	[0.79963]	[1.15076]
C	4.095573	-0.483164	-0.131779	-1.127130	-0.492948	0.248946	0.025684
	(0.96278)	(1.33793)	(0.71565)	(2.04025)	(2.39080)	(0.63927)	(0.03354)
	[4.25392]	[-0.36113]	[-0.18414]	[-0.55245]	[-0.20619]	[0.38942]	[0.76568]
R-squared	0.412642	0.123811	0.191930	0.193634	0.174667	0.194415	0.396166
Adj. R-squared	0.291715	-0.056581	0.025562	0.027617	0.004745	0.028559	0.271847
Sum sq. resids	107.8682	208.3087	59.60038	484.4074	665.1655	47.55678	0.130938
S.E. equation	1.781178	2.475223	1.323991	3.774556	4.423086	1.182679	0.062057
F-statistic	3.412328	0.686344	1.153650	1.166353	1.027925	1.172193	3.186691
Log likelihood	-79.40348	-93.22380	-66.94526	-110.9458	-117.6051	-62.20477	61.58931
Akaike AIC	4.162070	4.820181	3.568822	5.664086	5.981196	3.343084	-2.551872
Schwarz SC	4.493055	5.151166	3.899806	5.995071	6.312180	3.674069	-2.220887
Mean dependent	4.458239	0.238095	0.064286	0.411907	0.688196	0.052381	0.079611
S.D. dependent	2.116427	2.408036	1.341245	3.827783	4.433617	1.199937	0.072725
Determinant resid covariance (dof adj.)		8.849581					

Determinant resid covariance	2.016184
Log likelihood	-431.8933
Akaike information criterion	23.23301
Schwarz criterion	25.54991
Number of coefficients	56

Table 6A Impulse Response Function for Monetary Policy

Period	GDP Growth	Interest Rate	Budget Deficit	Inflation Rate	Debt to GDP Ratio	Unemployment Rate	Exchange Rate
1	0.000000	2.448744	0.436729	2.308627	0.261288	-0.086615	0.023723
	(0.00000)	(0.26718)	(0.19699)	(0.51530)	(0.68183)	(0.17781)	(0.00899)
2	-0.940261	0.272078	0.118708	0.838100	-1.174491	0.080429	0.038798
	(0.35446)	(0.45047)	(0.24755)	(0.70051)	(0.81640)	(0.22278)	(0.01252)
3	-0.972038	-0.345631	-0.136204	-0.605994	0.012051	0.185893	0.003977
	(0.39140)	(0.38222)	(0.19373)	(0.60409)	(0.73678)	(0.16623)	(0.01345)
4	-0.326450	-0.177409	-0.027263	-0.293341	0.295392	0.037218	-0.008588
	(0.35936)	(0.25576)	(0.11815)	(0.40650)	(0.51002)	(0.10210)	(0.01055)
5	0.071291	-0.036839	-0.012715	-0.068423	0.046339	-0.021844	-0.005682
	(0.27383)	(0.17365)	(0.06391)	(0.25841)	(0.30576)	(0.05083)	(0.00725)
6	0.119767	0.027025	0.010965	0.030957	-0.035884	-0.014771	-0.001456
	(0.17791)	(0.09829)	(0.02929)	(0.14833)	(0.14483)	(0.02916)	(0.00464)
7	0.052712	0.023473	0.007800	0.035459	-0.041936	-0.007429	0.000519
	(0.11107)	(0.05888)	(0.01666)	(0.08707)	(0.06435)	(0.01810)	(0.00275)
8	0.002585	0.005300	0.002132	0.008485	-0.017531	0.001070	0.000563
	(0.06645)	(0.03394)	(0.00917)	(0.05047)	(0.03623)	(0.01025)	(0.00161)
9	-0.009848	-0.002205	-0.000408	-0.003057	-0.000245	0.001603	0.000162
	(0.03862)	(0.01777)	(0.00474)	(0.02674)	(0.02122)	(0.00575)	(0.00090)
10	-0.005284	-0.002530	-0.000679	-0.003905	0.003029	0.000710	-4.95E-05
	(0.02142)	(0.00983)	(0.00274)	(0.01445)	(0.01186)	(0.00320)	(0.00048)

Standard Errors: Analytic

Table 7A Impulse Response Function for Fiscal Policy

Period	GDP Growth	Interest Rate	Budget Deficit	Inflation Rate	Debt to GDP Ratio	Unemployment Rate	Exchange Rate
1	0.000000	0.000000	1.238741	0.769676	0.810923	0.598206	0.008570
	(0.00000)	(0.00000)	(0.13516)	(0.44163)	(0.67546)	(0.16513)	(0.00856)
2	-0.157588	-0.317157	-0.411085	-0.397301	-0.346735	-0.339796	0.001774
	(0.30400)	(0.39696)	(0.21615)	(0.61632)	(0.71449)	(0.19571)	(0.01056)
3	0.048260	-0.095645	0.077177	-0.260472	0.243309	0.177696	-0.007812
	(0.22247)	(0.17073)	(0.14588)	(0.33567)	(0.32486)	(0.13897)	(0.00746)
4	0.120233	0.061524	-0.004444	0.130712	0.008739	-0.098688	-0.000986

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	(0.15791)	(0.09353)	(0.08556)	(0.21396)	(0.18968)	(0.09075)	(0.00362)
5	0.061189	0.008795	0.006742	0.004058	-0.060963	0.019497	0.000563
	(0.08384)	(0.04986)	(0.04203)	(0.09774)	(0.10764)	(0.04614)	(0.00213)
6	0.000741	0.013759	0.003453	0.023624	-0.003064	-0.007040	0.000683
	(0.04754)	(0.02964)	(0.01942)	(0.05036)	(0.05426)	(0.02315)	(0.00120)
7	-0.011418	-0.003835	-0.001050	-0.004699	-0.003743	0.003900	0.000257
	(0.02788)	(0.01455)	(0.00802)	(0.02464)	(0.02456)	(0.01042)	(0.00068)
8	-0.007379	-0.002441	-0.000808	-0.003865	0.005469	0.000542	-3.54E-05
	(0.01601)	(0.00821)	(0.00336)	(0.01305)	(0.01103)	(0.00490)	(0.00038)
9	-0.001039	-0.001106	-0.000332	-0.001670	0.002014	0.000111	-6.93E-05
	(0.00891)	(0.00476)	(0.00158)	(0.00702)	(0.00543)	(0.00221)	(0.00022)
10	0.001035	0.000125	4.69E-06	9.90E-05	0.000298	-0.000211	-2.95E-05
	(0.00503)	(0.00249)	(0.00072)	(0.00377)	(0.00301)	(0.00096)	(0.00012)

Standard Errors: Analytic

Table 8: A *Results of Variance Decompositions*

Variance Decomposition of GDP Growth

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.781178	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	2.265219	69.17635	17.22965	0.483981	2.121394	0.135538	0.146688	10.70640
3	2.515244	56.24255	28.90953	0.429359	1.791815	1.189970	1.165331	10.27144
4	2.573415	53.73918	29.22655	0.628453	2.304877	2.317606	1.969042	9.814293
5	2.586543	53.19574	29.00659	0.678053	2.589593	2.720865	2.056247	9.752921
6	2.590552	53.03240	29.13061	0.675964	2.603665	2.778863	2.049993	9.728507
7	2.591228	53.00596	29.15679	0.677553	2.603282	2.779971	2.052456	9.723989
8	2.591294	53.00350	29.15541	0.678329	2.604903	2.779847	2.053113	9.724893
9	2.591319	53.00247	29.15629	0.678332	2.605026	2.779797	2.053074	9.725015
10	2.591326	53.00219	29.15654	0.678344	2.605030	2.779804	2.053124	9.724966

Variance Decomposition of Inflation

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.781178	3.016916	37.40895	4.157993	55.41614	0.000000	0.000000	0.000000
2	2.265219	3.667031	35.87242	4.461621	47.29226	3.701127	4.661610	0.343936
3	2.515244	3.536994	36.41543	4.655324	46.63093	3.781283	4.460754	0.519282
4	2.573415	3.522111	36.66532	4.721671	46.32851	3.801080	4.439392	0.521921
5	2.586543	3.520150	36.65976	4.717643	46.32057	3.799103	4.453139	0.529628
6	2.590552	3.520116	36.65927	4.720035	46.31489	3.799832	4.452910	0.532946
7	2.591228	3.519914	36.66343	4.719782	46.31137	3.799528	4.452782	0.533195

8	2.591294	3.519889	36.66342	4.719812	46.31113	3.799578	4.452960	0.533214
9	2.591319	3.519882	36.66338	4.719815	46.31109	3.799624	4.452967	0.533247
10	2.591326	3.519879	36.66343	4.719811	46.31105	3.799625	4.452963	0.533250

Variance Decomposition of Debt

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.781178	0.021182	0.348970	3.361313	5.036430	91.23210	0.000000	0.000000
2	2.265219	1.241232	6.290116	3.379558	4.384230	82.86000	0.452327	1.392534
3	2.515244	1.542565	6.158648	3.560405	4.479740	81.82490	0.487321	1.946415
4	2.573415	1.529415	6.472301	3.529372	4.459409	81.41766	0.572660	2.019185
5	2.586543	1.526939	6.470796	3.539267	4.491940	81.36275	0.591159	2.017145
6	2.590552	1.526252	6.473280	3.537701	4.500353	81.35080	0.594841	2.016776
7	2.591228	1.526113	6.479954	3.537365	4.500183	81.34503	0.594774	2.016576
8	2.591294	1.526150	6.481130	3.537427	4.500107	81.34376	0.594847	2.016584
9	2.591319	1.526153	6.481120	3.537438	4.500159	81.34363	0.594862	2.016635
10	2.591326	1.526152	6.481155	3.537437	4.500158	81.34359	0.594862	2.016644

Variance Decomposition of Unemployment

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.781178	4.792362	0.536355	25.58399	7.380340	0.060461	61.64649	0.000000
2	2.265219	4.355752	0.837570	28.37533	6.508899	1.204308	57.59232	1.125820
3	2.515244	4.147347	2.763125	28.74815	6.195383	1.346826	55.71748	1.081691
4	2.573415	4.144941	2.822269	29.09928	6.152390	1.373576	55.33319	1.074352
5	2.586543	4.140651	2.844087	29.06801	6.224816	1.393253	55.24766	1.081531
6	2.590552	4.140040	2.855821	29.06489	6.224920	1.395840	55.23706	1.081433
7	2.591228	4.140183	2.858804	29.06440	6.224652	1.395775	55.23475	1.081431
8	2.591294	4.140158	2.858850	29.06424	6.224943	1.395781	55.23448	1.081552
9	2.591319	4.140151	2.858991	29.06419	6.224935	1.395780	55.23439	1.081566
10	2.591326	4.140150	2.859018	29.06418	6.224935	1.395782	55.23437	1.081565

Variance Decomposition of Exchange Rate

Period	S.E.	GDP	Interest Rate	Budget Deficit	Inflation Rate	Debt	Unemployment	Exchange Rate
1	1.781178	4.461741	14.61382	1.907191	1.168721	12.22700	0.837960	64.78357
2	2.265219	3.016519	33.48023	1.239982	1.194798	15.09122	3.854324	42.12292
3	2.515244	2.945107	31.42067	2.075024	2.417735	16.95083	4.873904	39.31673
4	2.573415	2.875290	31.75367	2.039660	2.887042	17.15551	4.803076	38.48576
5	2.586543	2.863157	32.05381	2.033226	2.871434	17.11036	4.789757	38.27826
6	2.590552	2.863850	32.06340	2.038685	2.879724	17.09896	4.797297	38.25808

7	2.591228	2.863620	32.06319	2.039383	2.883052	17.09723	4.797230	38.25630
8	2.591294	2.863488	32.06618	2.039297	2.882933	17.09635	4.797157	38.25459
9	2.591319	2.863479	32.06628	2.039349	2.883067	17.09629	4.797283	38.25426
10	2.591326	2.863474	32.06625	2.039357	2.883125	17.09630	4.797291	38.25421