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The Implication of Fiscal Variables in the Monetary Reaction Function of Pakistan

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Abstract: This paper investigates the influence of fiscal variables on the monetary reaction function in Pakistan. The main concern of a macroeconomic policy is to achieve sustainable growth and to keep a low level of inflation in the economy. For empirical analysis, the Autoregressive Distributive Lag model (ARDL) is applied using quarterly data for the period 2004Q1 to 2020Q4. The empirical evidence reveals that the monetary policy instrument in the monetary reaction function is explained significantly by the fiscal policy variables both in the short and long-run. Monetary policy independently cannot control inflation unless it has the support of the fiscal policy. Therefore, for an optimal policy mix, a wise monetary policy must be followed by a comprehensive fiscal policy in the case of Pakistan.

Key Words: Monetary Policy, Fiscal Policy, Policy Interaction

JEL Classification:

Introduction

The main concern of a macroeconomic policy is to achieve sustainable growth and to keep a low level of inflation in the economy. The economy's availability of an efficient labor force, capital, and technological development influences economic growth. Government changes the real sector of the economy by using fiscal policy. The second objective is achieved through monetary policy. While in the short run, through changes in the relative price elasticity, interest rate and wage inflation can be controlled.

A stable and low level of inflation has positive effects on economic activities. It encourages the business community and stimulates the economy as a whole. Therefore, the money supply can influence the price level. The price level can be controlled through money supply. However, variations in seigniorage revenues by the government can affect the price level control by the money supply (Sargent and Wallace, 1981).

Fiscal policy refers to how the government regulates taxes and expenditures to maintain the aggregate level of economic activity. Regulation of credit availability applied through monetary policy. However, monetary system control can be exerted, the money supply and other conditions that affect the economy's credit. Objectives of the central bank include the growth and economic

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development of the economy, stabilizing the exchange rate, securing the balance of external payments, and maintaining financial stability. Two different institutes implement monetary and fiscal policies, which are far from independence. The policy change by one Institute affects the overall impact of other policies.

Fiscal policy affects monetary policy through two channels: indirect and direct. It will cause an appreciation of the currency in real terms and difficulties in the balance of payment, possibly resulting in a currency crisis. Even if the government adopts a non-monetary way to finance the fiscal deficit, it will potentially result in crowding out. Excessive borrowing of the government will make credit very cheap or very expensive for the private sector. The outcomes will result in the destruction of economic growth and development, which is the target goal of monetary as well as fiscal policy. On the external side, reliance on foreign funding for domestic debt result in the risk of a balance of payment, which is the concern of monetary policy. The influence of indirect taxes on the price level and inflation, directly affect monetary policy. If the government increases indirect taxes instead of direct taxes it will affect prices directly. Therefore, this influence of the policies makes them interdependent in pursuing the macroeconomic objective of the economy. Fiscal policy has effect on the real interest rate, aggregate demand and output level and also has an effect on the price level. While monetary policy has influence over inflation expectations and on the short-term interest rate.

Fiscal policy can influence monetary policy for the short time period by three ways. First, adopting the discretionary fiscal policy, it can influence prices and economic growth. Second, the operation of fiscal automatic stabilizer can reduce short-term volatility. Third, by changing in the tax rates can influence the price level. On the other side, monetary policy affects cost of debt servicing to the government and affect the financing decision of the financial market. Hence, both policies have an influence on each other effect. Therefore, it is important to check the implication of fiscal policy in monetary policy while pursuing macroeconomic objectives.

In developing economies both policies are used to achieve macroeconomic stability. Traditionally, Pakistan economy is ranked with macroeconomic imbalances. From the past up till today Pakistan has faced high foreign debt, high nominal interest rate and inflation, budget deficits, low foreign reserves, and slow economic growth.

In general perception for the case of a developing country like Pakistan, monetary policy is under the control of fiscal policy but in actual execution, the central bank is independent of fiscal authorities. The financial reforms put light on the importance of coordination and the establishment of the Fiscal and Monetary Coordination Board in Pakistan. High coordination was observed in military regimes because of the better economic performance in that era (Arby and Hanif, 2010).

Currently Pakistan is facing a bad situation of its time period. Many economic indicators are performing badly. Pakistan is facing a severe situation of low investment, high inflation rate, increasing budget deficit, low capital inflow in the economy etc. increasing budget deficit and government borrowing discourages independent monetary policy. State Bank of Pakistan implement a tight monetary policy to discourage fiscal borrowings from commercial banks and other financial institutes and also from State Bank but it fails. Political bodies do not let the Central Bank to operate independently. State Bank of Pakistan adopts many policy reforms to decrease the failure of non-coordination among these policies but still has no improvement. Both policies play a vital role in economic development but monetary policy has great influence over economic growth instead of fiscal policy. Hence, there is a greater need to find the implication of fiscal policy in monetary policy (Jawaid et al, 2010), (Shahid and Waseem, 2016).

Literature Review

The following section contains the relevant fiscal and monetary policy interaction literature.

The most common feature of the recent studies (developed or developing) is that the burden of macroeconomic adjustment and inflation stabilization in the short-run drop down on the monetary policy. The chief concern of the monetary policy under these situations is to stabilize inflation and contribution to financial stability. Monetary policy can expand the government budget deficit in the short run under this state of affairs. Employing a simple framework to evaluate monetary policy measure on the budgetary implication influence the budget deficit in case of tight monetary policy. The cumulative effect was found to be greater than the individual effect. Tight monetary policy may cause an increase in the budget deficit, but it also reduces government debt in the short run (Dahan, 1998).

Laurens and Piedra (1998) analyzed fiscal and monetary policy coordination. They focused on the interaction of the policies at two different levels, i.e., institutional and operational procedures and achievement of the macroeconomic objectives targeted by the fiscal and monetary policy.. Monetary authorities focus on the stability of price levels and the central bank's independence. Fiscal authorities aim to minimize public debt for the development of the market. These separate functions of the fiscal and monetary policies decrease the need for interaction among these policies.

Blanchard and Watson (1986) has used two models to jointly analyze the effect of fiscal and monetary policy with the structural VAR model and Christiano's SVAR model. Their empirical results show that aggregate demand and supply and fiscal and monetary policy have a significant influence on the fluctuations of output and prices. Christiano's model suggests that fiscal policy plays a vital role in monetary policy.

Perotti (2005) scrutinize the impression of fiscal policy shock on GDP components, interest rate and price level. The data gather for 5 OECD countries using a structural vector autoregression model. The result shows that in the last twenty years, the effect of fiscal policy shock on GDP and its components, price level, and interest rate has become weaker for all countries except the US. The author explains this weakness of the fiscal policy over GDP and its components is due to more openness of the economies and the changing behavior of the monetary authorities.

It is explored the fiscal policy shocks over GDP and its components. It is found that deficit financed tax cut is the best fiscal policy instrument to stimulate the economy. Moreover, they found that deficit spending is weak stimulator which crowds out private investment without any increase in the interest rate and did not result into the rise of real wages. But they pointed out that unforeseen deficit financed tax cut worked as a short-term stimulus for the economy but not very sensible

Chen (2017) examined the interaction between fiscal-monetary policy tools; interest rate and government spending. By using a baseline linear model and a markov switching model analyzed the active-passive monetary and fiscal policy combination. Empirical findings showed that only increased government spending cannot be the cause of high inflation in the economy. Government spending has a positive but smaller effect on the output level as compared to the effect on interest cut. Under an active fiscal policy regime there is a significant increase in the duration of stimulus effect on output level. A strong effect occurs in the economy when both policies are active.

In recent time the main focus of monetary authorities is to maintain price stability and independence of monetary policy. While at the same time fiscal policy in market development has enabled debt managers to concentrate more on cost minimization. Thus, fiscal and monetary policies separate functions raise the importance of the interaction of these institutes for the optimization of economic performance and stability for the long period.

In European countries and various other economies, the effect of fiscal policy is the

ongoing interest of policy makers. Fiscal policy in the business cycle in the European economic and Monetary Union (EMU) (Tonhofen et al., 2010). The fiscal stability pact for EMU entails that constraint on fiscal policy controls the inflation. Leith and Lewis (2000) recognize the two policy regimes, when both policies follow a simple rule. In a situation of high inflation when monetary authority increases the real interest rate, a self-stabilizing fiscal policy is needed to ensure stability. In a condition where fiscal policy cannot ensure solvency constraint, the monetary policy should be passive. Their result showed that the central bank should not seek for debt stabilization as it is the concern of the fiscal stability pact.

Monetary policy firmly controls price stability, which implies that the aggregate output level is managed by the central bank at the euro-area level. While fiscal policy determines the aggregate demand at the national level across the participating countries of EMU. If fiscal policy is restricted to automatic stabilizer at the national level, it will bother the interaction of the policy. Also, it will affect monetary policy performance until automatic stabilizers are identical in nature in all participating countries.

Inflation targeting tight monetary policy leads to an increase in price level due to associated risk premium and lack of fiscal discipline in emerging market economies. Aktas et al (2010) analysis is based on two equations for the Turkish economy. First, they derive a model with the help of variable parameters and kept the risk premium ignored. This technique tracks down the effects of time-varying parameters on risk premium as well as the unpredictable nature of emerging market economies. Second, they evaluate the impact of fiscal discipline on monetary policy through the impulse response function. Findings showed that for the efficiency of the monetary policy, fiscal policy plays a vigorous role. The implementation of the suitable fiscal policy provides an opportunity for an active monetary policy. Bernanke (2020) explores the new tools for the effectiveness of monetary policy and concluded that for the significance of monetary policy tools and economic stabilization, the reliance upon active fiscal policy is crucial. Both monetary and fiscal policies struggle for effective stimulus in the economy in a timely manner. But without any clear implications of both policies for one and other, it will make trouble for policymakers to set the boundaries. There are chances that both policies offset each other effects (Bartsch et al., 2019).

Kim and Choe (2023) examined the monetary and fiscal policy equilibrium under incomplete information. There are chances that both policies may face cross signal jams in achieving their targeted goals due to change in their policy objectives. However, coordination is required for the effectiveness of both policies. There is a need to analyze the relationship between fiscal and monetary policy to anticipate their implications in achieving targeted goals. Fiscal policy can influence monetary policy indirectly through inflation expectation and exchange rate via playing an active role in affecting sovereign risk premium. However, fiscal dominance may also result in effecting monetary policy targets (Espitia and Rodreguez, 2022).

Theoretical Motivation

It is assumed that monetary policy has more concerned with inflation control while fiscal policy has its focus on output level. Preferences of both policies show their mission, inflation control as the monetary target and output gap as a fiscal target. More possibly an expansionary fiscal policy may become ineffective to encourage demand. Likewise, contractionary fiscal policy may turn in expansionary. However, when individuals feel, the government is extensively borrowing for its good which results in higher taxation. That is why individuals will tend to save more and consume less in the perspective of future expectations. Therefore, it means that the financial situation of individuals depends on fiscal sustainability. However, monetary policy decisions are based on the financial situation of the economic agents of a country.

If the central bank is independent of government, then the influence of fiscal policy

and monetary policy cannot be avoided automatically. To counteract the expansionary fiscal policy impact, aggregate demand and increasing inflation will encourage Central Bank to implement tight monetary policy by rising interest rate and decreasing the supply of money. The high interest rate could attract short term capital inflows which add fuel to the inflation and also affects the foreign exchange rate and will automatically result in destroying financial and macroeconomic stability.

Fiscal disorders may lead to high real interest rate, which further increases the debt servicing cost of the government. High-interest rate attracts capital inflow and boost inflation which make a difficult situation for monetary policy implementation. It is being difficult and costly for monetary policy to keep injecting capital inflows with a check on inflation in the economy.

Conceptual Framework

Figure 1
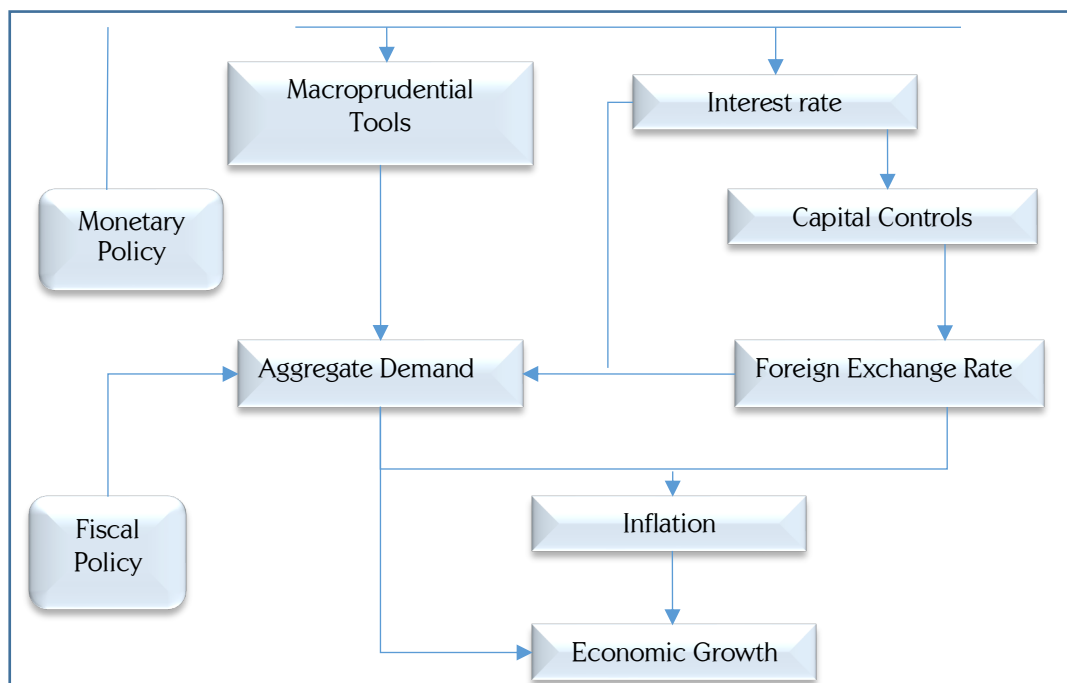
The above conceptual figure shows the relationship amid fiscal and monetary policy. The figure defines the interaction amid fiscal and monetary policy. The core purposes of monetary policy are to stabilize interest rate and the foreign exchange market to achieve sustainable economic growth. Mishkin (2001) define six objectives of monetary policy as price stability, interest rate stability, economic growth, employment level, exchange rate stabilization and financial sector stability. Similarly, fiscal policy holds different objectives to attain sustainable economic growth. Some of them are full employment, higher investment, reduction in income inequalities, targeting inflation and economic growth. The main focus of fiscal policy goes to upsurge the level of aggregate demand and to control the inflation rate for economic growth of the economy. But without the proper

interaction of both institutes these objectives are harder to obtain completely. As shown in the above figure, both policies flow through the same channel to achieve economic growth which shows that their interaction is necessary for the fulfillment of the objectives.

Variables and their Definitions

The operational definitions of variables and notations are presented below:

Money Market Rate Relative to Federal Funds Rate (MMR_FFR)

The money market rate stands for 3 months SBP rate, used by the state bank of Pakistan in conducting OPO. As the economy of Pakistan's currency is compared with USD, likewise money market rate is considered relative to the federal funds rate. The central bank of Pakistan uses federal fund rate of USA as a benchmark to set the SPB rate in alleviating the rupee in terms of the US dollar.

Depreciation of the Rupee in Terms of the Dollar (DEP)

Depreciation is obtained as a percentage change in the rupee contrary to percentage change in the US dollar, simply depreciation is the exchange rate of Pakistan in terms of USD.

Debt as a Percentage of GDP (DEBT_GDP)

The domestic debt of Pakistan includes both short and long-term debts are stated in trillion rupees, ultimately debt can be calculated as a percentage of GDP.

Inflation Rate (INF)

The inflation rate is obtained from GDP deflator, while the GDP deflator is the ratio of nominal GDP by real GDP.

Output-gap (OUTPUT_GAP)

The output gap is the alteration amongst the actual and potential level of output in an economy. To calculate the output gap, the Hodrick-Prescott filter technique is used. Hodrick-Prescott filter presented by Hodrick and Prescott (1997), is extensively used as levelling parameter among macroeconomics.

Relative Money Growth (Printing of Money) REL_MG

Relative money growth termed as the money supply is equal to the total monetary assets available in the economy at a specific time period.

World Oil Prices (LWOP)

World oil prices is used as an explanatory variable as it affects the inflation rate in Pakistan. In order to obtain small coefficient estimates, log is applied on world oil prices.

Fiscal Deficit as the Percentage of GDP (FD_GDP)

Fiscal deficit is taken as a percentage of GDP, as the values are in billions and trillions. A fiscal deficit is when government expenditure exceeds its revenue.

Data Type and Sources

The data for this study is taken from IFS (International Financial statistics) and World Bank, WDI (world development indicators) as well as from the handbook of statistics of Pakistan economy. The study analyzes quarterly data ranges from 2004Q1 to 2020Q4. To investigate the interaction between fiscal and monetary policy following variables are used monetary policy instrument, output gap, relative money growth, depreciation rate against the US Dollar, world oil price, inflation rate, debt to GDP ratio and fiscal deficit as a percentage of GDP.

The Econometric Model

For long-run relationship identification among variables, the ARDL model is used with different integration order. The estimated results of the specified variables stretches short and long-run relationship among them (Persaran et al., 2001). Autoregressive Distributed Lag (ARDL) model projected by (Pesaran et al., 1996 and Pesaran and Shin, 1997), estimates the variables relationship of

dissimilar orders i.e. I(0), I(1) and mix of both. In this approach each variable will stand as a single long-run equation unlike (Johanson and Juselius, [1990]) co-integrating method. In case any co-integrating vector is identified then it is reparametrized into ECM. Hence, resulting in the acquisition of short and long-run dynamics in a single model. This model also includes regressors unrestricted lags in a regression function. The identification of cointegration variables along with endogenous variables is specified through the co-integration procedure. This model is consisting of two stages, in the first stage, through the F-test long-run relationship is tested while the estimation of ECM and the coefficient of the long-run relationship is estimated in the second stage.

The unrestricted ECMs corresponding to fiscal-monetary interaction (3.1) and (3.2) are given below as equations (3.4) respectively as ARDL model applied equations:

$$\Delta fd\_gdp = \alpha_{F0} + \sum_{j=1}^{p} \alpha_{F1j} \Delta \inf_{t-i} + \sum_{j=0}^{q} \alpha_{F2j} \Delta output\_gap_{t-j} + \sum_{j=0}^{q} \alpha_{F3j} \Delta rel - mg_{t-j} + \sum_{j=0}^{q} \alpha_{F4j} \Delta dep_{t-j}$$

$$+ \sum_{j=0}^{q} \alpha_{F5j} \Delta lwop_{t-j} + \sum_{j=0}^{q} \alpha_{F6j} \Delta mmr\_ffr(-1)_{t-j} \sum_{j=0}^{q} \alpha_{F7j} \Delta dep\_gdp(-1)_{t-j} + \sum_{j=0}^{q} \alpha_{F8j} \Delta fd\_gdp(-1)_{t-j}$$

$$+ \gamma_1 \inf_{t-1} + \gamma_2 output\_gap_{t-1} + \gamma_3 rel\_mg_{t-1} + \gamma_4 dep_{t-1} + \gamma_5 lwop_{t-1} + \gamma_6 mmr\_ffr(-1)_{t-1}$$

$$+ \gamma_7 debt\_gdp(-1)_{t-1} + \gamma_8 fd\_gdp(-1)_{t-1} + \varepsilon_t$$

Where q_j is the chosen lag, ε_t is white noise error and Δ shows the first difference operator, α is the intercept, and long-run and short-run relationship is described by the remaining coefficients. The long-run coefficients are corresponded with $\gamma_j, j = 1,2,...8$ while the short-run coefficients are captured by the first difference variables i.e. α_{Fj}.

The importance of the explanatory variable to the corresponding reponse variable will be determine through the significance rather than from the coefficient's magnitude. This implies that if any variable has an explainable relationship with the dependent variable is considered as important.

Analysis

Descriptive Statistics Analysis

Before going into econometric analysis a detail descriptive statistics analysis is carried out. The data set for time series analysis consists of 16 years from 2004 to 2020. Table 1 demonstrates the descriptive statistics results for all variables used in the analysis of the study. Descriptive statistics exhibit information on the central tendency, dispersion, and normality of each and every variable in the study. Maximum and minimum values in the table indicate the outliers in the data set in a given time period. Kurtosis measures the peakness or flatness and shows the vertical shape of the distribution. While skewness measures the degree of asymmetry of the series and exhibits the horizontal shape of the distribution. Skewness reports normality in the distribution, all variables are normally distributed except DEBT_GDP. Kurtosis statistic of the variables exhibits that DEBT_GDP, DEP, and OUTPUT_GAP are leptokurtic and the remaining variables are platykurtic. The probability of Jarque-Bera test shows that the residuals of DEBT_GDP, DEP and OUTPUT_GAP are not normally distributed, while the residuals of the remaining variables are normally distributed. The null hypothesis for the Jarque_Bera test is that residuals are normal and residuals are not normal for an alternative.

Table 1

Descriptive Statistics Analysis.

	DEBT_GDP	DEP	INF	LWOP	MMR_FFR	OUTPUT_GAP	REL_MG	FD_GDP
Mean	67.18770	-0.000822	8.488183	4.082643	10.11864	-100.8228	14.80098	5.335246
Median	63.80000	0.701106	7.840484	4.174695	11.18198	-97.23310	15.00553	5.300000
Maximum	87.50000	5.464482	20.28612	4.695468	24.66000	-67.78625	19.62044	8.800000
Minimum	58.20000	-10.09024	1.810756	3.140698	0.830769	-159.1824	8.358963	2.300000
Std. Dev.	7.931264	3.752603	4.429453	0.499094	7.307714	20.12040	2.870372	1.654907
Skewness	1.526374	-0.881994	0.591892	-0.517300	0.297790	-0.833551	-0.217448	0.266527
Kurtosis	3.972763	3.449692	2.735836	2.044185	2.128421	3.279126	2.294193	2.410564
Jarque-Bera	26.09157	8.422778	3.739110	5.042615	2.832346	7.261904	1.746883	1.605271
Probability	0.000002	0.014826	0.154192	0.080354	0.242641	0.026491	0.417512	0.448146
Observations	61	61	61	61	61	61	61	61

Stationarity Test

To check that the variables of the time series data are stationary or non-stationary, a unit root test is implemented. It is mandatory for the ARDL model that all variables data should not contain integration order (2), they may have I(0), I(1) or a mix of both. ADF test is implemented to check the stationarity before estimation of the ARDL model. The outcome of the ADF test is presented in table 2, indicating that all the variables are insignificant at the trend. Also, it is been evident that no observation is stationary at I(2), therefore, the estimation process can be proceed for ARDL model further estimation.

Table 2

(ADF) Test for Stationarity.

Variable	Trend	(P-value) at level	(P-value) at First Difference	Integration Order
OUTPUT_GAP	Nah	0.001	0.0009	I (0)
MMR_FFR	Nah	0.2429	0.0124	I (1)
DEP	Nah	0.069	0.0005	I (0)
INF	Nah	0.3053	0.0026	I (1)
REL_MG	Nah	0.4371	0.0147	I (1)
FD_GDP	Nah	0.0489	0.0202	I (0)
WOP	Nah	0.2992	0.0475	I (1)
DEBT_GDP	Nah	0.8399	0.0031	I (1)

Co-integration Analysis

The bound test may provide efficient results for small data. The ARDL bounds testing provides a dynamic unrestricted ECM that integrates short-run with the long run by simple linear transformation (Dristsaki and Stiakakis, 2014).

Table 3 represent the outcomes of bounds testing, it is applied to check the co-integration amid variables.

Table 3

Long-run Relationship Analysis.

Bounds Testing for FD_GDP		
Null Hypothesis: No Long-run Relationships Exist		
Test Statistic	Value	k
F-statistic	5.587866	7
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10%	2.03	3.13
5%	2.32	3.5
2.50%	2.6	3.84
1%	2.96	4.26

Long-run Cointegration Coefficient Analysis for FD_GDP

Table 4 reveals a long-run cointegration analysis of ARDL model for the fiscal deficit as a percentage of GDP (FD_GDP), fiscal policy reaction function. Table 4 indicate that the depreciation of rupee in terms of dollar has positive and significant relationship with fiscal reaction function in the long-run. If there is increase in DEP by 1 percent will increase fiscal deficit by 0.36 percent at 5% level of significance. Theoretically, the coefficient of inflation depends upon the preference of the fiscal authority. The evidence shows positive relationship between inflation and fiscal deficit as a percentage of GDP, which means fiscal policy is inflation averse. This relationship is statistically significant in the long-run which indicates that if inflation in the economy increases will increase fiscal deficit in the economy in the given period. The relationship between the output gap and the fiscal deficit as the percentage of GDP is positive and statistically significant. But this coefficient is minimal. The evidence shows that, for the given time period, as much as the output gap (representing cyclical fluctuations in the economy) increases, fiscal deficit in the economy also increases. Moreover, relative money growth has positive and insignificant relationship with FD_GDP, which means that in the long-run REL_MG does not influence fiscal deficit significantly. LWOP has negative and statistically insignificant relationship with fiscal deficit. Debt to GDP ratio is also positively related to fiscal deficit in Pakistan both in the long run. This indicates that fiscal deficit in Pakistan increases due to increase in government debt. Finally, in fiscal reaction function, the monetary policy action that is the interest rate affects fiscal policy negatively but highly significant. That simply indicate that monetary policy action interacts with the fiscal policy action both in the short and long run. The result coincides with theoretical framework, which explained that fiscal policy will maximize its utility through considering

monetary policy. In fiscal policy reaction function DEP, INF, OUTPUT_GAP and DEBT_GDP explains fiscal policy reaction function significantly. While MMR_FFR significantly influence fiscal deficit in opposite way, which reveals the interaction of both the policies.

Table 4

Long-run Cointegration Coefficient of ARDL for FD_GDP.

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEP	0.3629	0.0959	3.7833	0.0014
INF	0.6717	0.0538	12.4953	0.0000
OUTPUT_GAP	0.0507	0.0203	2.4963	0.0225
REL_MG	0.0355	0.0400	0.8890	0.3858
LWOP	-0.0344	0.2056	-0.1672	0.8690
DEBT_GDP	0.3023	0.0107	28.2223	0.0000
MMR_FFR	-0.1407	0.0197	-7.1380	0.0000
C	-13.5079	2.4154	-5.5925	0.0000

Estimation of Short-Run Cointegration and Error Correction Mechanism for FD_GDP

Table 5 reports the estimation results of short-run cointegration and ECM of ARDL model for fiscal policy reaction function. Short-run elasticities are denoted by D and (-1), (-2), (-3) exhibits lag values of projected variables. Table 5 discloses that DEP is negatively related to fiscal policy reaction function in the short-run but have strongly significant influence. Though it has insignificant relationship with fiscal deficit in the long-run. The world oil price has negative but highly significant impact on fiscal deficit in the short. This indicates that fiscal deficit in Pakistan increases due to increase in government debt. The fiscal-monetary interaction can be explained from MMR_FFR, which indicates negative but highly significant influence and presence of interaction. The value of ECM is negative and sufficiently significant exhibits long-run association amid the variables of the analysis, indicates that error correction mechanism takes place in the cointegration analysis satisfying the Granger representation theorem. However, the adjustment speed is 0.59 percent from previous year disequilibrium to current year equilibrium.

Table 5

Cointegration and error Correction Mechanism for FD_GDP.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FD_GDP(-1))	-0.339	0.065	-5.189	0.000
D(FD_GDP(-2))	-0.376	0.059	-6.385	0.000
D(FD_GDP(-3))	-0.691	0.082	-8.437	0.000
D(DEP)	-0.126	0.013	-9.543	0.000
D(DEP(-1))	-0.066	0.021	-3.142	0.006
D(DEP(-2))	-0.025	0.017	-1.513	0.148

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEP(-3))	-0.099	0.015	-6.486	0.000
D(INF)	0.163	0.045	3.634	0.002
D(INF)	-0.004	0.035	-0.126	0.902
D(INF)	0.112	0.035	3.216	0.005
D(INF)	-0.328	0.027	-12.031	0.000
D(OUTPUT_GAP)	0.041	0.004	11.501	0.000
D(OUTPUT_GAP(-1))	0.010	0.003	3.156	0.006
D(OUTPUT_GAP(-2))	-0.017	0.004	-4.268	0.001
D(OUTPUT_GAP(-3))	0.008	0.007	1.178	0.254
D(REL_MG)	0.158	0.016	9.863	0.000
D(REL_MG(-1))	-0.014	0.028	-0.475	0.641
D(REL_MG(-2))	-0.080	0.029	-2.723	0.014
D(REL_MG(-3))	0.225	0.025	8.985	0.000
D(LWOP)	-1.786	0.237	-7.541	0.000
D(LWOP(-1))	-0.064	0.333	-0.191	0.850
D(LWOP(-2))	0.469	0.338	1.387	0.182
D(LWOP(-3))	-1.886	0.277	-6.815	0.000
D(DEBT_GDP)	0.414	0.019	22.069	0.000
D(DEBT_GDP(-1))	-0.034	0.059	-0.576	0.572
D(DEBT_GDP(-2))	-0.183	0.063	-2.884	0.010
D(DEBT_GDP(-3))	0.430	0.046	9.417	0.000
D(MMR_FFR)	-0.088	0.019	-4.665	0.000
D(MMR_FFR(-1))	0.017	0.015	1.134	0.272
D(MMR_FFR(-2))	-0.038	0.011	-3.495	0.003
ECM(-1)	-0.596	0.037	-15.978	0.000

Diagnostic Testing

Diagnosting test of ARDL model in table 6 shows that it fulfills the property of OLS and found no instability in the model.

Table 6
Diagnostic Test for FD_GDP.

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.132558	Prob. F(1,17)	0.7203
Obs*R-squared	0.44102	Prob. Chi-Square(1)	0.5066
Heteroskedasticity Test: ARCH			
F-statistic	0.525421	Prob. F(1,54)	0.4717
Obs*R-squared	0.53963	Prob. Chi-Square(1)	0.4626
Normality Test			

Jarque-Bera	2.086528
Probability	0.352303

Discussion of the Analysis

The purpose of this section is to discuss the outcomes of the study done in previous segment.

The importance of influence of both the policies in developed economies has been observed less as fiscal policy is considered self-sufficient in attaining macroeconomic stability. However, fiscal policy enforces central bank to overcome the fiscal deficit. Moreover, separate functions of fiscal and monetary policies decrease the effects among both the policies (Lambertini and Roverlli, 2002), (Daly and Smida, 2016) and (Daly, 2015). Whereas, for the case of EMU's (Hagen and Mundschenk, 2002) and (Gali and Monacelli, 2008) suggests that if the purpose of monetary policy is output stabilization, then both the policies should coordinate together for better outcomes (Kim and Choe, 2023).

Hence, it is being observed and concluded from the previous section analysis that the monetary policy instrument explains the fiscal policy reaction function significantly in the long run. Depreciation, inflation, output gap, relative money growth, world oil prices, debt to GDP ratio and monetary policy instrument significantly contributes the adjustment process in the error correction process of the fiscal reaction function. The error correction mechanism in the integration analysis shows that 59 percent error correction takes place in the cointegration of fiscal reaction function. The coefficient of the long run relationship shows that monetary policy stronger interacts with the fiscal policy. In other words, the interference of the fiscal policy in the monetary policy is less powerful. The global variable such as world oil prices does not seem significant in the fiscal reaction function in the long run, this result is found similar to the study of Shahid et al, (2016). According to the (Abdel-haleim, 2016), the degree of interaction among the fiscal and monetary policies depends on the appropriate policy mix. Thus, in the fiscal-monetary game,

cooperation is necessary for the effectiveness of both the policies (Rehman, 2005 and Kim and Choe, 2023). Hence, both the policies should coordinate and cooperate for the successful achievement of economic goals in case of Pakistan.

Conclusions and Recommendations

This paper investigates the influence of fiscal policy in monetary policy in Pakistan. The study comprises of quarterly data from 2004-Q1 to 2020-Q4. The main objective of monetary policy is price stability, while output stabilization is the concern of fiscal policy. Monetary and fiscal policies are executed by two diverse institutes and both are distant from independence. As the alteration in policy by one Institute affect the overall impact of other policy. Tension can arise between both the institutes that what each Institute should do to help in even economic cycles and achievement of economic growth and stability. Due to the above reason, it is important to follow a reliable fiscal monetary policy mix and coordination of these policies to avoid tensions and inconsistency. Although in practice developing countries face a wider mix of disparities and necessitate a comprehensive set of policy retorts (Espitia and Rodreguez, 2022).

Developing countries mainly faces the monetary expansion which is due to excessive borrowing from external banks and external sources to finance fiscal deficit. Monetary expansion leads to balance of payment disequilibrium (Aghelvi and Khan, 1976 and Otani and Park, 1976). Fiscal authorities finance budget deficit usually through borrowing or by issuing government bonds. When the government is over indebted, then the central bank purchases the government bonds and securities which increase money supply and reduce pressure of interest rate. However, by doing this the real value of money decreases and an unpredictable situation prevails in the economy. Therefore, an

undisciplined fiscal policy worsens the effectiveness and stability of monetary policy (Kim and Choe, 2023). Usually, government finance its budget deficit by printing new notes, therefore monetary policy implementation cannot be independent of fiscal policy. Monetary policy independently cannot control the inflation unless it has the support of fiscal policy (Sargant and Wallace, 1981).

Thus, in the fiscal-monetary game, cooperation is necessary for the effectiveness of both the policies (Rehman, 2005 and Kim and Choe, 2023). For an optimal policy mix, it is mandatory that the wise monetary policy should be followed by comprehensive fiscal policy in case of Pakistan.

The finance ministry and SBP should coordinate properly so that the macroeconomic objectives for the economy of Pakistan could efficiently be achieved.

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