

The Fiscal and Monetary Policy Responses to Inflation in the Long Run: A Case Study of Pakistan Economy

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ABSTRACT

The chronic current account situation of Pakistan as a result of foreign borrowing has caught the attention of researchers and policy makers specifically the aftermath of the flexible exchange rates adaptation that in turn caused frequent price fluctuations within the economy. It has now become a challenge for Pakistan to bring stability in prices with stable economic growth especially after the pandemic situation. What factors determine and can target these price fluctuations that affect the well-being of common man. The “Ricardian regime” favors monetary policy to be a pertinent component to determine the level of prices. The “non-Ricardian regime” supports fiscal policy as an important determinant of prices and their movement. Therefore, an empirical research is conducted to analyze whether “Ricardian or non-Ricardian regime” is responsible for these price fluctuations. For this purpose, the present study examines the impact of fiscal and monetary policy stance on inflation in Pakistan from 1980 to 2022 using the autoregressive distributed lag model. The finding reveals that the fiscal-consolidation along with expansionary monetary policy significantly influence inflation in both short and long terms. A monetary expansion causes inflation while fiscal-ease does not contribute to inflationary pressures in Pakistan economy. The results suggest that inflation in Pakistan is more responsive to other fiscal and monetary factors than fiscal ease in the long run. Moreover, moderate fiscal-consolidation along with contractionary monetary policy can help manage inflationary pressures and promote growth.

Key Words Fiscal policy; ARDL; money supply growth; inflation

INTRODUCTION

Inflation is termed as “a persistent increase in general level of prices” within an economy. Consistent Inflation has very distortionary effects for any economy. It has very serious socioeconomic implications. Thus, it is crucial to study what factors, in any economy, can influence the level of prices or cause movement in prices. Earlier research focused on the monetary policy responses to price changes in an intended way supporting the Ricardian monetary policy regime. But the difference comes through the fiscal policy responses during the last couple of years that favors Non-Ricardian fiscal policy based regime affect price fluctuations (Jiang, 2024). In the Classical View, both Ricardian monetary policy regime and non-Ricardian fiscal policy regime” have been responsible to determine the levels of prices within an economy. Former Ricardian Classical regime favors the monetary policy of an economy as an important determinant of the level of prices whereas the Non-Ricardian regime tends to support the economy’s fiscal policy as a pertinent tool to determine the price level. Some of these previous empirical studies (Cochrane, (1998 & 2000); Sims, (1994 & 1997); Leeper, (1991); Woodford, (1994, 1995 & 2001)) have also emphasized the fiscal policy variables as determining factors for the level of prices. These research studies have, in detail, discussed the importance of fiscal policy which plays a key role in determining the price level within the economy. Likewise, Sargent & Wallace, (1975); Leeper, (1991); Woodford, (1994, 1995 & 2001); supported fiscal side variables that influence prices according to open macro-economic environment. Additionally, some latest research studies include Sriyana and Ge (2019); Bordo and Levy (2021); Eita et al.,(2021); Ferrara et al.,(2021); Biachi and Melosi, (2022); Banerjee et al., (2022); Nguyen et al., (2022); Cevik & Miryugin, (2023); Jiang, (2024).

However, Khan and Agha (2006) and Javid, et al., (2008) also favor non-Ricardian view for Pakistan economy, that fiscal policy is responsible to determine the rate of inflation. Given this, the primary objective with regard to present research gets on to assess that whether a non-Ricardian fiscal policy regime would affect level of price fluctuations in case of Pakistan from an open macroeconomic orientation. Whenever government expenditure exceeds revenue, a fiscal deficit must be accumulated and in turn, it exerts negative impact on the pace of economic growth of the economy. The fiscal consolidation policy helps to come out of this situation.

Inflation is generally associated with monetary expansion. The situation in Pakistan is no different from that of other countries. In fact, the rise of general level of prices can be attributed to a growth of money supply. While immediate inflation causes are associated with monetary growth and fiscal imbalances, changes in monetary attitudes point to the economy's other sectors. It is a common argument with regard to fiscal-side imbalances, exchange rates and government spending activities may play a key role in explaining fluctuations in general level of prices within the economy. Fiscal-ease or state activity can be measured by the degree of government participation in the economy. In its traditional form, it can be computed as a ratio of total government spending to the total product of an economy. Various reasons are involved in fiscal-expansion or the increase in government spending activity. As Adolf Wagner pointed out that "A functional relationship exists between increase in government expenditures and increase in per-capita income". (Anyanwu, 1997). Musgrave and Roster (2009) also established the development theory of government expenditure.

Minford and Fan (2011) formulated the Fiscal Theory of Price Levels-FTPL model to evaluate the inflation dynamics, cointegration analysis along with indirect inference techniques by utilizing the time-series data of inflation variable from the year 1970(IV) to the year 1978(IV). The study concludes about fiscal policy is to be exogenous while money-supply is to be endogenous. A case study of Brazil by Moreira et al., (2007), added that monetary-fiscal policy transmitting channel by employing the quarterly data for the period of 1995-2006, Leeper (1991) Model with Phillips and fiscal-IS curves. They are in favor of Non-Ricardian model to be adequate for the Brazilian economy, since the fiscal policy dominance directly affects the output-gap variable and in indirect way affects the rate of inflation.

Another study by Afonso, (2002) discussed Leeper-Sims-Woodford (LSW) fiscal theory of inflation covering 32-years of observations by utilizing Pane Data Analysis in between the period 1970-2001. Afonso applied FTPL on Debt/GDP ratio and primary budget surplus/GDP ratio of the 15-EU economies. The findings of the study showed that, during the periods under observation, Fiscal Price Theory was not well suited to the 15 EU-economies. The research work by Javid et al., (2008) investigates about debt accumulation, fiscal frontier, price trends and fiscal surplus by employing Vector Auto-regressive model-VAR on time-series data. Javid et al., showed the rising trend of inflation in Pakistan over the years. While change in wealth has increased and affected nominal government debt, the discount rate has decreased as a positive consequence of high inflation.

A contribution by Khan and Agha, (2006) in case of Pakistan, formulated a long term association between the two; higher price levels and indicators of budget. The study, analyzing time series data for the period 1973-2003, developed a VAR model with Vector Error-Correction Mechanism (VECM), Johansen's cointegration econometric techniques. The findings favor the well-known Monetarist view that inflation has an association with the increase in money supply and monetary policy growth.

By utilizing time series data (1976-2019) of Pakistan, Malik et al., (2021), developed an interaction of economy's growth with fiscal decentralization. They found that ever-increasing share of local government expenditure and government revenues may slow down the economic growth rate.

This study focuses on Pakistan, a developing economy suffering from persistent inflationary pressures. Due to its distortionary effects, policy makers and authorities need to formulate and implement certain inflation targeting policies and approaches in order to achieve the stable price objectives with in the

economy. For this purpose, the study utilizes different fiscal and monetary policy fundamentals by investigating the relationship between inflation, fiscal imbalances, monetary growth, government spending activities, and real effective exchange rate (REER) and also tests the Critical Limit Hypothesis (CLH) which states that inflation is triggered when fiscal expansion exceeds 25% of total economic activity. For this purpose, by analyzing data in between 1980-2022 using ARDL model. The results show that money supply and fiscal side imbalances contribute significantly to cause inflation within the economy both in short and long-run, whereas, government activity as a percentage of GDP has not reached the critical threshold to affect inflation.

This suggests that in Pakistan economy, inflation is more sensitive to both monetary-side as well as other fiscal-side factors than government spending, providing important insights for economic policy making. Politicians and researchers attach great importance to fiscal policy effects on country's economic activity or growth through inflationary/deflationary situations. In short run, fiscal policy may stimulate growth through government expenditures at the expense of public deficit, lesser production and higher inflation. Whereas fiscal policy appears to achieve its objectives by increasing the tax burden, while it may slow down economic activity in the long run (Surjaningsih, Utari, and Trisnanto, 2012).

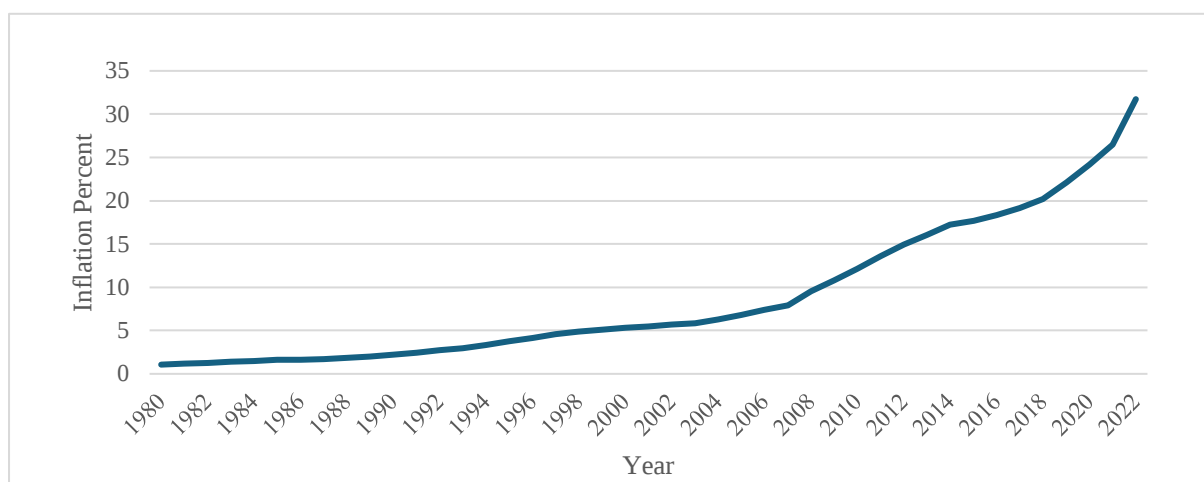


Figure 1. Inflation rate trend over the years in Pakistan

The research gap in this study lies in the limited investigation into how fiscal policy stance in the context of Critical Limit Hypothesis (CLH) along with expansionary and contractionary monetary policy affect inflation in developing economies like Pakistan in the long run. The existing literature has analyzed extensively the interaction of inflation with money supply, whereas, the criteria determining how fiscal consolidation and fiscal ease causes inflation and/or the inflation effects especially through the fiscal policy perspective has not thoroughly been studied in Pakistan.

The present study fills this gap by analyzing the repercussions of long term fiscal consolidation and fiscal ease in the context of CLH on inflation in Pakistan, specifically in terms of government spending activities when they account for a small share of the economy; a situation that has been overlooked in previous studies. After the introduction, the remainder of the research work is structured as follows; literature is reviewed in section-2, section-3 discusses data description, Model specification and methods used to investigate the above relationship in this study, and Section 4 interprets the research results. While, the last section of the paper provides conclusion and possible policy recommendations in case of Pakistan.

LITERATURE REVIEW

Different theories of inflation such as the demand pull, costs push, structural, and imported inflation have factored out many causes of inflation. Demand-Pull inflation, according to Gbanador, (2007); can be explained as total or aggregate demand (for goods and services) within the economy exceeds total or aggregate supply (of goods and services), causing to increase the overall price level. The higher demand for factors of production (FOP) at the full employment level of output only increases costs for that factor, it will raise the production's costs. In the case of supply constraints, when the demand surpasses the potential level of output, there will be inflation in the country (Otto, 2011).

Cost push inflation is the other illustrative background to inflation. The term "cost-push inflation" indicates the inflation that result from the supply side in the market. The intensifying costs of production is seldom to severely blame. It occurs when the manufacturing cost upsurge and have strong effect on the final product's prices (Otto and Nenbee, 2011). This is considered as "the market-power-inflation" since a rise of costs comes from "the supply side within the economy". Consequently, there will be a huge increase in wages or a decrease in the productivity of labor, anything that raise cost of labor. And according to Otto and Nenbee, 2011; It may also be caused by other output conditions or variable costs, like raw material, power supply or transport. In an imperfect competitive structure of market, the cost-push inflation may be arisen due to manufacturers benefits motivation (Otto, 2011).

The structural theory relate inflation to economic growth. Different structural changes that are necessary for growth create disequilibrium in the country (Luc et al., 2003). According to Friedman, (1942 & 1957) and Varshney and Maheshwari, (2014); inflation and economic development are correlated, especially in the developed nations where both institutional and structural restrictions are existing. A critical revision of inflation in USA during 1955-57, Schultz (1957) originate that Variation in prices caused by sectoral shifts in production but not by demand-pull and/or cost-push inflation. He further explored that prices in undersupplied sectors do not ruin, higher demand of goods and services in the remaining sectors will increase general price levels causing inflationary situation within country (Schultz, 1957).

Nations that severely depends on imports hurt from imported inflation (Jhinghan, 2008). Inflationary situation might happen due to goods being dumped in importing country, in the form of inputs and finished goods, consequently inflation in home country rises (Jhinghan, 2008). Inflation could be dispersed through different channels in the economies that have been discussed. Pakistan is also suffering from mostly imported and cost push inflation as compared to demand full inflation.

Sriyana & Ge, (2019), using Shin's model for the period 1971-2017, investigated the symmetric effects of fiscal policy variables on the rate of inflation in both short and long run. Government expenditures contribute more to raise inflation than the fiscal deficit. Ferrara et al., (2021) have explored the effects of government spending shocks on the rate of inflation, spanning 1964Q1- 2015Q4, by employing Bayesian VAR analysis. Their findings indicate a rise of government expenditures tends to cause an appreciation of RER thus, triggers inflationary pressures about 0.27% in first three years.

Nguyen et al. (2022), using period in between 1997-2020 for Vietnam, evaluated the fiscal and monetary policies' effects on inflation. Their finding favored that fiscal deficit positively influence on inflation by the rate of 2.943. Eita et al. (2021) examined fiscal deficit's impact on inflation using ARDL from 2002 to 2017. Long-term: fiscal deficit positively affects Namibia's inflation. Causality runs from fiscal deficit to inflation.

The study by Banerjee et al., (2022); analyzed the panel for advanced economies to examine the inflationary effects of fiscal deficits. It was found that higher deficits had an average effect on inflation. In addition, in fiscal dominance, both future inflation mean and variance are higher than they are under monetary dominance.

Bianchi and Melosi (2022) studied fiscal framework's impact on inflation. They found changes affect trend inflation significantly, while cost-push shocks have temporary effects. Pre-pandemic, moderate fiscal inflation countered deflationary pressure, aiding central bank in averting deflation. Bordo and Levy (2021) among other also investigated that whether enlarged fiscal deficits cause inflation and found the significant impact of fiscal deficits on Inflation.

Cevik and Miryugin (2023) explored the fiscal shock effects on inflation across 139 countries from 1970 to 2021. The findings show that inflation increases with an expansionary fiscal policy. Notably, this impact is more pronounced in developing countries. In addition, the extent of the inflationary impact depends on factors such as fiscal capacity, economic conditions, monetary policy, exchange rates, and fiscal rules during the shock.

Jiang (2024) estimated the the effect of monetary policy on inflation through its different instruments under fiscal policy perspective. His findings favored the non-Recardian fiscal policy regime attributing the fiscal policy response makes the difference. He reported the expected impact of large scale asset purchase is much smaller on inflation than the other instruments. Easy fiscal policy is adopted in the short run in response to tight monetary policy while under unconventional monetary policy, fiscal consolidation is found to be less intense in the long run.

Another study by Swanson (2024) identified the impact of conventional and unconventional monetary policies on the US economy. To capture their distinct economic impact he used the identification approach of monetary policy VARs. He found the shocks of federal fund rate have very strong effect than forward guidance and large-scale assets purchases. Although standard errors of these estimates are found to be substantial.

DATA, MODEL AND METHODOLOGY

Data has been obtained from State Bank of Pakistan (SBP) and World Bank's World Development Indicators (WDI) for the period 1980 to 2022. Data on fiscal imbalances and Government activities are calculated by the researchers, however the data on inflation and money supply growth are collected from SBP and REER is extracted from WDI. See Appendix 1 for the current data trend of all these variables in Pakistan.

Econometric Model

This study formulated the estimation model following the work of Sriyana and Ge (2019); Eita et al.,(2021); Ferrara et al.,(2021) and Nguyen et al., (2022) to analyze the fiscal policy effects combining with the influence of monetary policy over inflation in Pakistan. It incorporates both the fiscal and monetary policy variables like fiscal imbalances, growth of money supply, government expenditures and REER for the analysis. The dependent variable inflation is shown as a function of all the explanatory variables in the model shown by equation (1) as under;

$$INF = f(FIMB, GMS, GA, REER)-----(1)$$

Where:

- INF = Inflation Rate (CPI Based)
- FIMB = Fiscal Imbalances (budget deficits and surpluses)
- GA = Government Activities (computed as aggregate government spending to GDP ratio)
- REER = Real Effective Exchange Rate

Then equation (1) can be taken as an estimable form of econometric analysis as follows:

$$INF_t = \beta_0 + \beta_1 FIMB_t + \beta_2 GMS_t + \beta_3 GA_t + \beta_4 REER_t + \mu_t \text{ -----(2)}$$

Where, β_0 is an intercept term; β_1 to β_4 are parameters (slope coefficients) to be estimated; and μ_t is the stochastic term. β_1 is expected to appear with '+' or '-' signs, as It can be explained with the general fact about budget, a budget deficit is associated with high inflationary situation and budget surplus will low inflationary situation in the economy. It is predicted that β_2 will appear with a '+' sign as the growth of broad money applies a positive effect on inflation. It is consistent with statement of monetarist school of thought that too much money in the circulation will probable rises prices leading to severe inflation in the country. β_3 shows the impact of GA in prompting the inflation It is also expected to have a '+' sign depending on the threshold suggested by the Critical Limit Hypothesis (CLH), that if the government expenditures exceed the 25% threshold (of total economic activity) it will trigger inflation and if it remains below the threshold it will have no role in promoting inflation. In addition, β_4 will appear with '-' sign showing an inverse relation between inflation and REER, a decrease in REER lead to a rise in inflation because Pakistan's economy is an import-oriented economy weaker domestic currency raises the cost of imports as well as import bill.

Econometric Techniques

The researchers employed the ADF test, ARDL Bounds test for cointegration, and an error-Corrections model (ECM) for their current analysis. ADF test is conducted as a prerequisite to check the stationarity of variables of interest. It is important to mention that Dickey and Fuller (1979) propose a test for checking the stationarity of data known as ADF test. If the variables are not stationary and time series estimation techniques are applied, then it is quite possible that the regression result may be spurious. Therefore, stationarity of the variable is an important step before the estimation of the model. Then bounds-test is applied to analyze whether a long-term association exists among variables or not as some variables are not stationary at level. Thus, the mixed order of integration of our model's variables made it appropriate that we apply ARDL model to find the impact of explanatory variables on our focused variable i.e., inflation. Another reason in applying ARDL model it helps us in time series data to assess the dynamic (short as well as long term) relationships in the single equation framework. For the application of ARDL approach we use appropriate lags. For lag selection we applied Akiak Information Criterion (A.I.C) and Schwartz Bayesian Criterion (S.B.C). To find co-integration among variable in the long run we applied bound test. When F-statistic value exceeds upper bound, we conclude that co-integration exist among variables. Conversely when F-statistic remains below the lower bound; it is suggested that there is no co-integration and, when F-statistic stays in between lower and upper bound values than relationship between variables is inconclusive And the ECM illustrates how the disequilibrium in short run is corrected to achieve long-term equilibrium. The ECM of linear ARDL for Equation 2 can be represented as under;

$$\begin{aligned} \Delta INF_t = & \varphi + \sum_{i=1}^{\theta_1} \delta_{1i} \Delta INF_{t-i} + \sum_{i=0}^{\theta_2} \delta_{2i} \Delta FIMB_{t-i} + \sum_{i=0}^{\theta_3} \delta_{3i} \Delta GMS_{t-i} + \sum_{i=0}^{\theta_4} \delta_{4i} \Delta GA_{t-i} \\ & + \sum_{i=0}^{\theta_5} \delta_{5i} \Delta REER_{t-i} + \gamma_1 INF_{t-1} + \gamma_2 FIMB_{t-2} + \gamma_3 GMS_{t-3} + \gamma_4 GA_{t-4} \\ & + \gamma_5 REER_{t-5} + \mu_i \end{aligned} \text{ (3)}$$

Equation 3 represents all the explanatory variables that have impact on dependent variable inflation. The short run effects are estimated by $\sum_{i=1}^{\theta_1} \delta_i$ (where, $i=1, \dots, 5$) and long run impact is calculated by γ_i (where, $i = 1, \dots, 5$).

The summary table below displays that how short run as well as long run impact is estimated for our econometric analysis and summarized for the general understanding of the reader.

Analysis of the Short Run Impact and Long Run Impact

Impact Hypothesis	Short run Impact	Long run Impact
Null Hypothesis: H0:	$\sum_{i=1}^{\theta_1} \delta_i = 0$	$\gamma_i = 0$
Alternate Hypothesis: H1	$\sum_{i=1}^{\theta_1} \delta_i \neq 0$	$\gamma_i \neq 0$

The two hypotheses would be tested for the impact analysis. If we accept the Null hypothesis then no short and long run impact of all the explanatory variables on Inflation is considered. Conversely if we accept the alternative hypothesis then we reject the Null of no impact and we infer that all the explanatory variables have effect on Inflation both in the short and long run.

Variables and Data Sources

To establish the relationship between inflation and relevant variables such as fiscal imbalances (FIMB), money supply growth (GMS), government spending activities (GA) and lastly real effective exchange rate (REER), we select time span from 1986 to 2022. We mainly focus on whether fiscal policy base non-Ricardian regime has edge over the monetary policy based Ricardian regime to study the inflationary pressures in an underdeveloped economy Pakistan.

Table 1: Variables And Data Sources

Variables	Definition	Notation	Source
INFLATION	Inflation is defined as a persistent increase in price levels within an economy. It is Consumer Price Index (CPI) based inflation rate.	INF	SBP
FISCAL IMBALANCES	Fiscal Imbalances can be explained as budget deficits and budget surpluses, a budget is in deficit if government expenditures exceed its income (revenues) and a surplus budget means government's income (revenues) is greater than its spending.	FIMB	SBP
MONEY SUPPLY GROWTH	Money supply growth is defined as the growth rate of broad money in Pakistan.	GMS	SBP
GOVERNMENT ACTIVITIES	Government spending activities are termed as government activities These activities are taken as aggregate government expenditures as a percentage of GDP.	GA	SBP
REAL EFFECTIVE EXCHANGE RATE	It is defined as a measure of the value of a currency against a weighted average of several foreign currencies of the world divided by a price index.	REER	WDI

Descriptive Statistics of Variables

The descriptive statistics for the model's variables show that mean value for our dependent variable is 8.75. It ranges between 1.07 and 31.73 and probability is 0.012. Money supply growth has the mean value 14.54 and it lies in the range of 4.44 to 25.96 while probability is 0.037. Similarly, the mean for

government activities variable is 0.17 and its minimum value is 0.00014 and maximum is 0.33 and probability value is 0.10, REER mean value is 118.8 and its minimum and maximum values are 93.54 and 217.55 respectively. All the values including Jarque-Bera are reported, only the standard error around the FIMB estimate is substantial.

Table 2: Descriptive Statistics

Value	INF	FIMB	MGS	GA	REER
Mean	8.752000	82035.70	14.53999	0.171684	118.8440
Median	5.485866	-71589.00	14.58286	0.186890	105.7400
Maximum	31.73447	2370741.	25.95782	0.330580	217.5583
Minimum	1.065739	-525075.0	4.444836	0.000135	93.53719
Std. Dev.	8.047059	637829.3	3.727340	0.118283	33.59478
Skewness	1.105706	2.685284	0.342757	-0.481220	1.757569
Kurtosis	3.231633	8.900742	4.790497	1.720170	4.683329
Jarque-Bera	8.857994	114.0606	6.585822	4.594291	27.21504
Probability	0.011926	0.000000	0.037146	0.100545	0.000001
Observations	43	43	43	43	43

Correlation Of The Variables

Table 7 shows the correlation of all the variables including inflation (INF), fiscal imbalance (FIMB), money supply growth (GMS), government spending activities (GA) and real effective exchange rate (REER). Correlation value lies between 0 and 1. Correlation value near to 1 shows strong correlation and value near to zero represents weak correlation among variables. The value of fiscal imbalance is (0.626) which is greater than 0.5 and it shows that INF is strongly correlated with FIMB. Correlation value between INF and GMS is (0.749) which also shows that INF and GMS have strong correlation.

Table 7: Correlation Matrix Of The Variables

	INF	FIMB	MGS	GA	REER
INF	1	-0.626	0.749	0.521	-0.932
FIMB	-0.626	1	0.733	-0.703	-0.595
MGS	0.749	0.733	1	-0.825	-0.714
GA	0.521	-0.703	-0.825	1	-0.687
REER	-0.932	-0.595	-0.714	-0.687	1

There is also strong correlation between INF and GA and REER because computed correlation values are near to one i.e., 0.521 for GA and -0.932 for REER. While the value for GA and FIMB (0.7) which shows strong correlation between these variables in our analysis.

DISCUSSION OF RESULTS

Unit Root Test Results

Stationarity of the Variables is checked through unit root test. Unit Root test is applied based on the results of Augmented Dicky Fuller Test using 5% level of significance and constant term. It is important to mention that Dickey and Fuller (1979) propose a test for checking the stationarity of data known as ADF test. If the variables are not stationary and time series estimation techniques are applied, then it is quite possible that the regression result may be spurious. Therefore, stationarity of the variable is an important step before the estimation of the model. The results are shown in Table number 3.

Table 3: ADF Test Result with Constant Assumption

Variables	Level	5% Critical Value	Ist Difference	5% Critical Value	Results
INF	-2.2032	2.9485	-3.6129**	-2.9571	I(1)
FIMB	-2.7384	-2.9332	-6.6265**	-2.9351	I(1)
GMS	-4.3631**	-2.9331			I(0)
GA	-0.6082	-2.9332	-7.1582**	-2.9354	I(1)
REER	-2.5158	-2.9333	-6.1990**	-2.9456	I(1)

Source: Computed by Author

The Variables are stationary at mix order. Inflation rate, Fiscal imbalances, Government Activities and Real effective exchange rate are integrated of order one i.e I(1) and growth rate of broad money supply is integrated of order zero, i.e I(0).

Table 4: Bounds Test for Levels Relationship

F-statistics (Wald test)	4.3697**	Level of Significance	I(0)	I(1)	Decision
		10%	2.45	3.52	Co-integration
		5%	2.86	4.01	Co-integration
		1%	3.45	4.25	Co-integration

So, we have mix order of integration both at level and first difference, the bound test is conducted to check the existence of any level relationships. The outcome of the test is presented in table 4. The test shown that the calculated F value exceeds the value at 10%, 5% and 1% (upper bounds) critical significance level. Bounds test confirms the long run relationship among variables. It means that co-integration exists. Now we can estimate both long-run and short-run parameters of our model.

Long Run Results

In order to check the effect of all the monetary and fiscal policy variables on inflation rate in Pakistan, the long-run results of ARDL are shown in table 5. Here we observed, fiscal imbalance, broad money growth and REER have statistically significant effect on inflation rate in Pakistan. Moreover, the government activities appear to have insignificant impact in the given time period. FIMB shows negative relation with inflation rate. A one percent changes in FIMB will reduce the INF by 0.009%. It can be explained with the general fact about budget, a budget deficit is associated with high inflationary situation and budget surplus will low inflationary situation in the economy.

Table 5. Long Run Results

Variables	Coefficients	Standard Error	t-statistics	Probability
FIMB	0.00921	0.00234	3.9358	0.00017**
GMS	0.50141	0.17361	2.88816	0.0032**
GA	-3.2086	5.92836	-0.54122	0.2958
REER	-0.008242	0.001917	-4.29778	0.0006**
C	19.151537	3.235370	5.919427	0.0000**

The significance of GA in prompting the inflation does not hold as suggested by the Critical Limit Hypothesis (CLH). As we know from our data that government expenditures (percentage of total economic activities) does not reach to the 25% threshold as specified in CLH. Therefore, GA variable is not inflationary during the 1980 to 2022. In addition, there is an inverse relation between inflation

and REER, a decrease in REER lead to a rise in inflation because Pakistan's economy is an import-oriented economy weaker domestic currency raises the cost of imports. It is also predicted that the growth of broad money applies a positive effect on inflation. Hence, 1 percentage rise in growth of broad money will lead to 0.5014% rise in inflation and vice versa. It is consistent with statement of monetarist school of thought that too much money in the circulation will probable rises prices leading to severe inflation in the country.

Short Run Results

Various studies found that short-run dynamics can create some degree of distortions in inflation, the short-run Error Correction Model (ECM) is also estimated to find out how the short-run disequilibrium is corrected yearly. It is shown in table 6. Here FIMB also shows negative relation with inflation, one percentage variation in FIMB will leads to lower the inflation by 1.3756%. Growth rate of money is positively link to inflation. It shows that one percentage rise in money supply leads to raise the inflation by 0.0447%. It is also being discovered from the result that one-period lag of growth of money supply reduces inflation by 0.0392%. Government activities is negatively related to inflation both in the short-run as well as in the long-run. However, the same pattern is also seen for the short-run effect of REER on inflation in Pakistan during the period of study.

Table 6: Short Run Results

Variables	Coefficients	Standard Error	t-statistics	Probability
D(FIMB)	-1.3756	0.2105	-6.5349	0.0046**
D(GMS)	0.0447	0.0106	4.2169	0.0073**
D(GMS (-1))	-0.0392	0.01102	-3.5571	0.0059**
D(GA)	-8.9401	6.8755	-1.3002	0.1008
D(REER)	-0.6242	0.9917	-0.6294	0.2430
ECM (-1)	-0.5389	0.1028	-5.2422	0.0003**
R-Squared	0.7760		Adjusted R-Squared	0.7583
AIC	0.0534		DW-Statistics	2.02

The coefficient of ECM is -0.5389 which is negative, statistically significant at 5% level and lies in the range of zero and one. We can say that 53.89% of the short-run disequilibrium is corrected yearly so that equilibrium is returned in the long-run. The adjusted R-squared, which measures the coefficient of determination in case of multiple regression model and as a sign for the goodness of fit of the model, is 0.7583 and signifies that 75.83% of the total variation in inflation is explained by the explanatory variables.

Stability Test

The stability of parameters is checked by using the CUSUM (Cumulative Sum) approach. The result of the test is presented in Figure one where the blue line illustrates the CUSUM, and the dashed red lines represents the 5% level of significance. The blue line lies in the range of upper and lower bounds, it indicates that the parameters are stable, and these can be precisely used for forecasting.

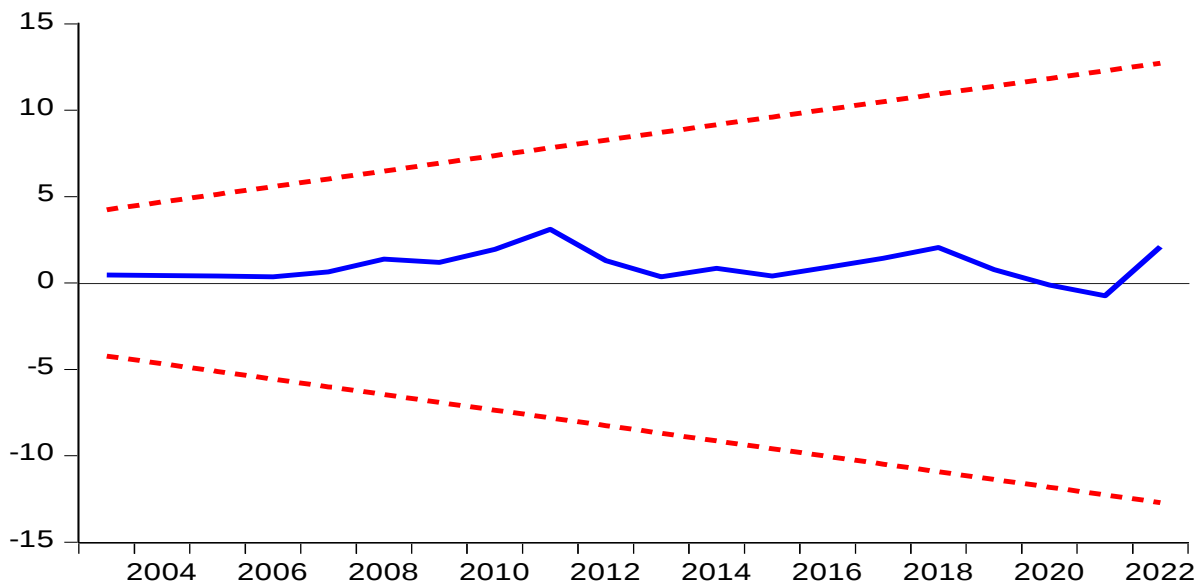


Figure 2: CUSUM

CONCLUSION

The current study explored the effect of fiscal as well as monetary policy on rising inflationary pressures in Pakistan. The main aim of the study is to achieve the inflation targeting objective through fiscal policy perspective. This study tested the Critical Limit Hypothesis which states that “Inflation can even occur under the balanced-budget when government spending share exceeds the 25% of total economic-activity within an economy. The study employed an ARDL approach to capture short term as well as long term dynamics of inflation with reference to Pakistan for the period 1980 to 2022. It was found that the short and long term monetary expansion significantly contributed to inflation in Pakistan. Fiscal consolidation is not inflationary in the short run but it raised inflation in the long run. However, fiscal expansion is not inflationary in nature in both long and short run as it remains below the threshold level of 25%. The ECM suggests that 53.89% of the short-run disequilibrium is adjusted yearly. The government and monetary authorities need to d collective efforts to follow the policy of monetary contraction with moderate fiscal expansion to target inflationary pressures in Pakistan economy.

POLICY IMPLICATIONS

This research study has some serious policy recommendations for the policy makers and researchers those aim at achieving inflation targeting objectives in Pakistan. The study favors both of the Ricardian and non-Ricardian regimes that fiscal and monetary factors both play a vital role in determining the price level in Pakistan. The monetary expansion exerts inflationary pressures in both long and short run, hence, not recommended for the Pakistan economy. While fiscal easing under limit along with fiscal consolidation are found to be less intense in short run. Hence fiscal expansion is favorable for the economy but fiscal consolidation promotes inflation in long run. Thus providing a guideline for the government, policy makers and monetary authorities that the moderate fiscal ease along with properly managed monetary policy stance do not encourage inflationary pressures thus will promote long term economic growth within the economy. Which in future can help Pakistan to achieve fiscal balance by reducing its current account deficit. While large scale fiscal easing beyond specified limit may raise fiscal deficit and depress economic growth by exerting inflationary pressures within the country. Thus, present study helps policy makers to formulate solid short term as well as long term policy measures in order to sustain the Pakistan economy that will help to achieve long term sustainable development goals.

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Appendix.1 The Data Trends of Focus Variables in case of Pakistan

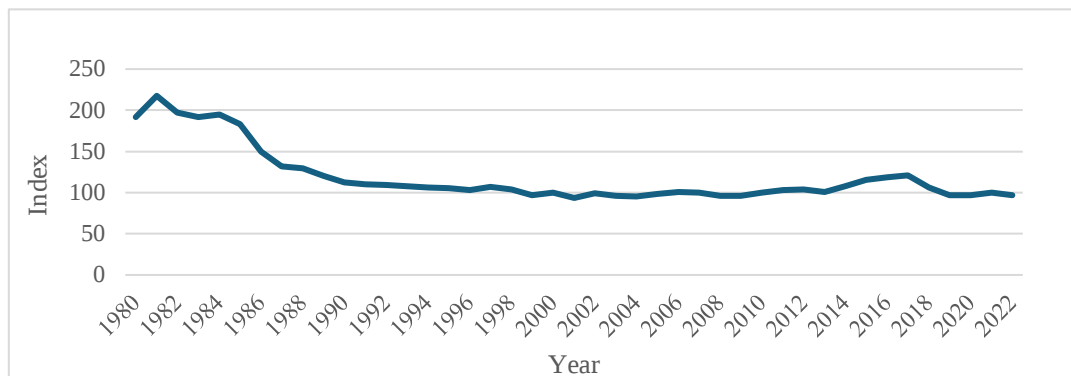


Figure 3: Real Effective Exchange Rate

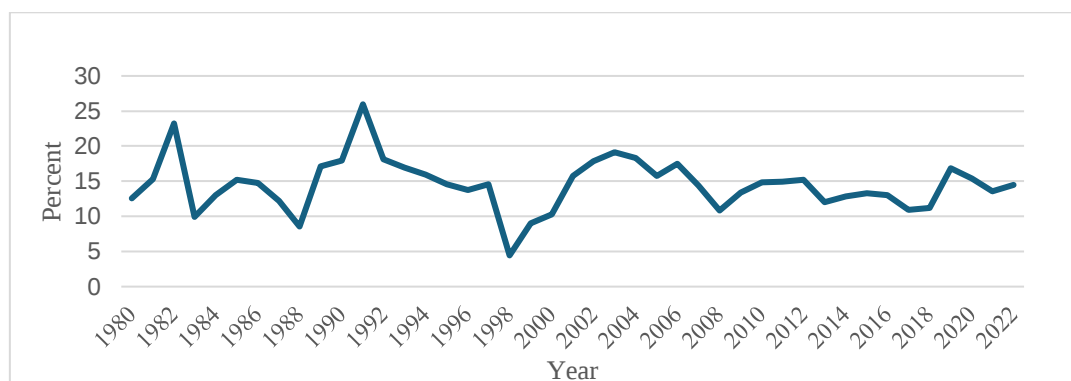


Figure 4: Money Supply Growth

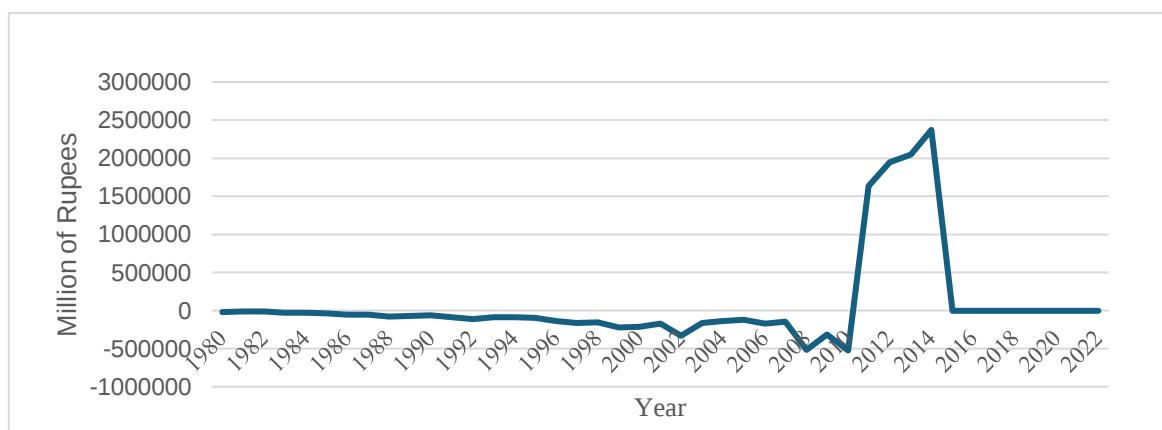


Figure 5: Fiscal Imbalance

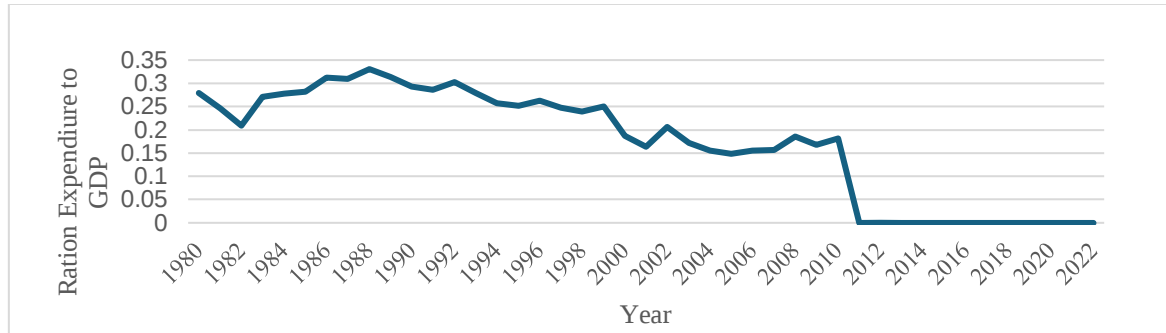


Figure 6: Government Activities