



Debt Management, Policy Coordination and Stability Region

Asim Mumtaz^{1*}  | Siti Rahyla Binti Rahmat²  | Irfan Hussain³ 
| Auroob Irshad⁴ 

Abstract

Monetary and fiscal policies are important responsibilities of the government, and they are closely connected. To avoid conflicts between them and maintain a stable economy and financial system, these policies need to operate in a "zone of stability." The biggest danger of stepping outside this zone is that the public might lose trust in the government and its decisions. In recent years, both policies have been pushed closer to the limits of this stability zone because they were often used to boost economic growth. However, tests like the ADF Unit Root, Johansen Cointegration, and Multivariate Regression Analysis show that in Pakistan, the country's fiscal (government spending and taxation) and monetary (control of money supply and interest rates) authorities work well together. Their combined efforts remain within the "region of stability," helping to keep the economy stable, protect institutions, and allow for careful policy adjustments when needed. We have assessed the degree of coordination between Pakistan's authorities in charge of its monetary and fiscal policies, as well as the Region of Stability for each policy. These estimates add to the body of knowledge already available on the topic.

Keywords: *Monetary and Fiscal Policies, Differential Games, Region of Stability*

Author's Affiliation:


Institution: University Sains Malaysia ^{1,2}, Government College University Faisalabad³, Iqra University⁴

Country: Malaysia, Pakistan

Corresponding Author's Email: * asimmumtaz82@hotmail.com

The material presented by the author(s) does not necessarily portray the view point of the editors and the management of the ILMA University, Pakistan.

2790-5896 (Online) 2709-2232 (Print) ©2024, published by the ILMA University, Pakistan.

This is open access article under the  license. <https://creativecommons.org/licenses/by/4.0/>

INTRODUCTION

We are witnessing the simultaneous emergence of high inflation and financial stress for the first time in decades. Even while each has its own unique reasons, they are all, for the most part, symptoms of the cumulative impact of fiscal policy (FP) and monetary policy (MP) that has been supportive during the previous decades, leading to the unprecedented support measures that have been implemented in reaction to the epidemic. For an extended period, policy rates in numerous countries—both nominal and real—were historically low, and central bank balance sheets increased to unprecedented heights during times of peace. Concurrently, significant and ongoing budget deficits caused the national debt to gradually rise to previously unheard-of heights. These policy paths contributed significantly and persistently to inflation and encouraged the accumulation of financial fragilities (Bank of International Settlements, 2023)

Monetary and fiscal policy, two of the state's primary economic duties, is essential to maintaining both economic stability and public confidence in the decision-making process. Both policies provide people special access to and control over how money is spent in society. The authority to raise taxes and the right to issue debt secured by future tax receipts determine fiscal policy. The authority to create "money," an irredeemable sovereign obligation used as a form of payment, rests with monetary policy. These abilities reinforce one another. Money demand is maintained and the use of money as a payment instrument is encouraged by the need to pay taxes with it. A stable monetary system, in turn, makes the tax base stronger. The ultimate foundation of the privileged powers of fiscal and monetary policy is an implicit social compact supported by public confidence in the government. People trust the government to use tax revenue for the benefit of the public; therefore they agree to pay it. In a similar vein, individuals tolerate using money to make payments because they have faith in the central bank to protect its value (Bank of International Settlements, 2023)

The goal of inflation targeting, or IT, is to limit or target inflation through monetary policy. The central bank's interest rate serves as the primary tool for this purpose, and it makes all of the choices on policy rates and modifications. The aforementioned statement amalgamates two pivotal components: firstly, that the central bank should be the exclusive authority for determining monetary policy, specifically interest rates, to curb inflation. However, it should be noted that the government retains the ability to intervene in case of an emergency, like a financial crisis (Qanas&Sawyer 2023)

Keeping a difference in between MP and FP is a goal of an independent central bank, but this separation is not perfect because monetary policy decisions always have an impact on the budget and this difference sometimes requires be minimizing or eliminating at times of high inflation and policy rates and vice versa. It is imperative to acknowledge the necessity of coordination under these circumstances in order to maintain independence. The result of the interaction between taxing, spending, and open market operations by monetary authority is inflation (Sims, 2016)

Politicians with limited vision may find it alluring to support projects backed by debt financing and insist monetary authority for debt purchase to prevent high policy rates. Such measures cause significant inflation, but they do it gradually—possibly after the next election. This was the feature of hyperinflationary events in Europe and extremely high inflationary eras in Latin America, marked by significant budget deficits, fast money supply expansion, and high inflation, The fiscal and monetary policies are two of the most significant economic decisions(Sims, 2016)

The central bank's independence suggests that the interaction of two independent decision-makers with (partially) competing goals can be used to evaluate the formulation of economic policy. The literature now frequently uses game theoretic analysis to examine how MP and FP interact. Institutions in this sense can be thought of as the government's (G) and the central bank's rules for the game. Thus, the game's equilibrium can be discovered under several institutional configurations, i.e., under various assumptions about the pacing of play, the information available to each policymaker when it comes time to make a decision, and the likelihood of cooperation between the policymakers (Bartolomeo & Gioacchino, 2004)

Hansen (1958) defines fiscal policy as all government decisions about taxes and spending that impact the total size of public debt, while monetary policy and debt management focus on the structure of that debt, not its overall amount. He explains that government actions can be divided into fiscal policy and monetary policy/debt management. If a transaction is fully funded by taxes without affecting the public debt, or if the debt-financed portion doesn't alter existing government commitments (like money already in circulation), it qualifies as pure fiscal policy. Hansen suggests that this distinction marks the boundary between fiscal and monetary policy.

According to Sargent and Wallace (1981), if the government's fiscal policy doesn't generate enough future budget surpluses to cover its debt, the central bank has to step in and create money (seigniorage) to balance the budget. While the central bank can temporarily reduce inflation, this doesn't solve the problem long-term. Lower inflation today just means there will be higher inflation in the future. No monetary policy, including inflation targeting, can permanently keep inflation low.

If the financial crisis is a reflection of people fleeing government debt, then preventing deflation necessitates increasing the amount of government debt available, which would mean increasing both the existing and anticipated deficits at the present price level. The central bank's ability to stabilise the economy may be constrained if the treasury is unable to accommodate this rise in demand(Walsh, 2011)

A sustainable fiscal budget requires the central bank to maintain its independence at all times. To mitigate the danger of losses for the central bank when interest rates rise and to set it apart from debt management strategies, monetary policy ought to be active in open market operations, particularly in short-term government securities (Goodfriend, 2011)

LITERATURE REVIEW

Khan's (2022) study shows the negative effects of inflation targeting. He looks at the economic performance of 29 countries that don't use inflation targeting (IT) and 30 countries that do, covering countries from different economic backgrounds. He finds that countries without IT have a higher annual growth rate, outperforming IT countries by more than 0.5 percentage points. Khan also notes that inflation targeting seems to have harmed the labor market in countries that adopted it compared to those that didn't. His findings suggest that both inflation targeting and central bank independence may have slowed down economic activity.

Altunbas and Thornton (2022) offer more information about the impacts of IT. Data from 121 nations between 1971 and 2015 are presented, and the results indicate that the use of IT "has been associated with a decline in the labor share of national income relative to the profits share and a worsening of income distribution measured by the Gini coefficient."

Since the 2008 financial crisis, the value of coordinating fiscal and monetary policy has been debated, especially with regard to policies that involve very low interest rates. Such coordination could hurt the credibility of monetary policy and create problems for managing both public and private debt. Bartsch et al. (2020) highlighted the importance of a balanced policy mix in their "Geneva Reports on the World Economy 23," arguing that effective coordination between fiscal and monetary authorities is needed to ensure that stimulus programs work. They explained that monetary policy, by keeping borrowing costs low through forward guidance and lowering risk-free rates, acts as a safety net for government debt. This helps prevent crises in the debt market. At the same time, the treasury acts as a safety net for the central bank, protecting it if monetary policy actions lead to financial losses. This support allows the central bank to take necessary risks while maintaining its independence and credibility.

Several studies have explored the relationship between central bank independence and fiscal deficits. Parkin (1987) found that countries with high central bank independence, like Switzerland and Germany, had long-term fiscal deficits as a percentage of GNP, while France, with less central bank independence, had lower deficits. Masciandaro and Tabellini (1988) found a negative relationship between fiscal deficits and central bank independence across countries like Australia, Japan, New Zealand, Canada, and the US. New Zealand had the highest fiscal deficits and the lowest central bank independence. Grilli, Masciandaro, and Tabellini (1991) also found that higher central bank independence was linked to lower fiscal deficits, although they noted that this relationship was less important when political factors were included.

Other studies, like those by Muscatelli (2002) and Semmler and Zhang (2003), looked at how fiscal and monetary policies interact. They found that these interactions vary by country. In the US and UK, monetary policy responded to fiscal expansion, but this was not the case in Italy, Germany, or France. Dixit and Lambertini (2001, 2003) examined monetary and fiscal policy coordination within a monetary union,

showing that optimal inflation and output can be achieved whether policies are pre-committed or discretionary. However, they also found that when the goals of the fiscal and monetary authorities differ, it can lead to conflicts.

Lambertini (2005) studied how these interactions affect macroeconomic stability and found that when both policies are applied independently (discretionary), the result can be less-than-optimal outcomes, with more output and lower inflation than desired. He concluded that to achieve stability, policies need clear commitments and coordination. Niemann, Pichler, and Sorger (2013) explored which monetary tools work best in coordination with fiscal policy and found that interest rates are often the best tool, though there are exceptions.

Finally, Blake and Kirsanova (2011) looked at the effects of a central bank focused too much on controlling inflation, showing that this can lead to imbalances if fiscal policy is generous. When the two policies don't work together, it can cause social harm due to conflicting goals.

In summary, non-cooperation between fiscal and monetary authorities can be modeled as a "Nash Game," where each side tries to minimize its own losses based on the other's actions. The result is a Nash Equilibrium, where neither authority can improve their situation by changing policy alone, which can lead to suboptimal outcomes if the policies are not coordinated.

In the second model of noncooperation between fiscal and monetary policies, one policy is decided first before the other. This means that either the government or the central bank sets its policy first, and then the other reacts based on that decision. This approach affects how the two policies interact and the final outcomes. The Stackelberg Game is the name of this policy-making process. The person who makes the first move is referred to as the Stackelberg leader, and the person who makes the second move is referred to as the Stackelberg follower. In this procedure, the leader selects their policy while the follower responds to them. The leader also anticipates the follower's reaction when selecting their policy.

Depending on the economic model being utilized, different output levels and inflation rates are at equilibrium. The cooperative solution is Pareto optimal in comparison to the noncooperative solution in each of the three economic models. This outcome remains constant regardless of the non-cooperative Nash or Stackelberg structure. The economy performs better in a cooperative environment, and losses to the various policy-making bodies are smaller than in a non-cooperative environment. This also applies if the government and central bank give equal weight to their inflation targets in comparison to their output targets.

According to Andersen and Schneider's (1986) summary of the findings, there is frequently a disagreement over the "correct" course for policy when there are two autonomous authorities acting in their own self-interest. This outcome should be considered whenever the frequently advanced argument suggests that a separate monetary authority ought to be established. The presence of two impartial policy makers does not inherently ensure that one policy outcome will be preferred over

another under alternative institutional options.

Empirical evidence suggests that in the majority of emerging nations, fiscal policy takes precedence over monetary policy. Therefore, the government can finance its deficits in four different ways: 1) Using central bank loans at zero cost of funds to monetize the deficit. 2) Taking out loans at interest rates lower than market rates by forcing debt onto captive purchasers, typically from commercial banks. 3) Borrowing from overseas in foreign currencies and 4) Borrowing from willing domestic private-sector lenders at market interest rates (Cukierman, 1992)

THE COMBINED CB AND GOVERNMENT BUDGET CONSTRAINT

The government's and the central bank's balance sheets are closely related. Consequently, this strengthens the connection and may make it harder to distinguish between monetary and fiscal policy. Because the government "owns" the central bank, the balance sheets are combined.

Government securities, private sector claims (such as bank loans), and (often but not always) foreign exchange reserves make up its assets. Its obligations come in the form of "monetary liabilities," or public cash and bank reserves, which make up the "monetary base," as well as own debt. They frequently might also contain government deposits. The capital of the central bank is the difference left over after deducting liabilities from assets. The capital of the central bank is listed as an asset on the fiscal authority's balance sheet together with any other assets that the authority owns or issues as liabilities.

First, when central banks buy large amounts of long-term government debt, it becomes a major debt management action, depending on how the central bank funds the purchases. Since the amount of money (currency) in circulation is controlled by demand, the central bank has two options: it can either increase bank reserves or issue its own short-term debt, which is very similar to government debt. However, if the central bank wants to keep control of interest rates, it must pay interest on those reserves; otherwise, the interest rate would fall to zero.

Second, the central bank's profits and losses affect the government's financial situation. This can either help or hurt the government's budget in ways that might not be obvious if we only look at the government's financial statements. For example, the government might extend the maturity of its debt, but if the central bank buys that same debt, it essentially turns into short-term debt. This would make the government's budget more vulnerable to rising interest rates, leading to higher interest costs for the central bank and lower revenue for the government, as the central bank would send less money back to the treasury.

HOW LONG TERM GOVERNMENT DEBT MAY IN FACT BE OVERNIGHT

A. Govt Issues More Debt		B. CB Buys More Debt		C. The Maturity of Consolidated Govt Debt Declines	
G		CB		Consolidated	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
↑LR Asset	SR Bills	↑ LR Bonds	↑Overnight Debt	↑ LR Assets	SR Bills
	↑ LR Bonds				↑Overnight Debt

Source:- Bank of International Settlement, 2023.

More information about how MP and FP interact can be found in the stylized consolidated balance sheet. To illustrate the budget restriction, consider the following:

$$\Delta D_{l,t} + \Delta D_{f,t} E_t = r_{l,t} D_{l,t-1} + r_{f,t} D_{f,t-1} E_t - P B_t - \Delta M_t \quad 1$$

Where

$D_{l,t}$ is consolidated domestic currency debt.

$D_{f,t} E_t$ is the total amount of foreign currency net debt stated in foreign currency (debt less foreign reserves).

E_t is the exchange rate.

$r_{l,t}$ and $r_{f,t}$ are the interest rates that coincide.

$P B_t$ is the principal balance, which is calculated as taxes less spending less interest paid.

$A = \pi r^2$ is the shift in obligations that do not bear interest (cash and reserves)

Since the aforementioned variables are all expressed in nominal terms, the factors influencing the evolution of the net debt-to-GDP ratio are highlighted by dividing by nominal GDP and combining the net debt's domestic and foreign currency components;

$$\Delta d_t = (r_t - g_t d_{t-1}) - p b_t - s_t \quad 2$$

Where

$p b_t$ and $s_t = \frac{\Delta M_t}{\Delta Y_t}$ are the primary balance and so called seigniorage as a share of GDP,

respectively, g_t is the growth rate of nominal GDP. Note that the effective interest rate r_t is the weighted average of the interest rate paid on domestic and foreign currency debt, with α_t indicating the share of domestic currency debt in total net debt and includes valuation effects through the depreciation e_t of the exchange rate;

$$r_t = \alpha_t r_{l,t} + (1 - \alpha_t)(r_{f,t} + e_t) \quad 3$$

The stability of the economy is affected by the debt-to-GDP ratio. As this ratio rises, the range of interest rates and fiscal balances that keep the economy stable becomes smaller. This means that higher debt levels make it harder to maintain both macroeconomic and financial stability. Two key factors are important here: the main fiscal balance and the “growth-adjusted interest rate,” which is the difference between the interest rate on government debt and the economy’s growth rate. If this difference is positive (meaning the interest rate is higher than the growth rate), the debt-to-GDP ratio will grow over time, and the pace of growth will speed up as debt increases.

This highlights the close link between fiscal and monetary policy. For example, raising interest rates might be necessary to control inflation, but if the fiscal situation is already unstable, higher rates could worsen it and create pressure on the economy. On the other hand, if the government’s fiscal position is weak, it limits what monetary policy can do, making it more expensive to manage inflation. In extreme cases, if there are serious concerns about the government’s trustworthiness, monetary policy might fail to control inflation altogether.

These worries might lead to capital flight, a run on government debt, and a significant decline in the value of the currency, all of which would lead to inflation. Fears of a potential default would only grow if monetary policy were tightened dramatically, particularly if a portion of the debt was in foreign currency. Even if default could be averted, increased and probably runaway inflation would result. Ultimately, fiscal support is needed to ensure low and steady inflation.

THE DETERMINANTS OF THE STABILITY REGIONS

The “zone of stability” is the range of combinations of monetary and fiscal policies that help maintain a stable economy and financial system. Sometimes, there can be tensions between these two policies, but they can still work together within this zone. However, if these policies go beyond the zone’s boundaries, the stability of the economy is at risk. One challenge for policymakers is that this zone changes over time in size, shape, and location. Sometimes it can be large, covering many different economic situations, but it can also quickly shrink. Policies that once supported stability might suddenly stop being effective (Borio and Disyatat, 2021).

Several factors shift the zone of stability. Some of these change slowly, like advances in technology, financial innovations, and changes in labor markets due to demographic trends. These slow changes influence how policies promote stability. Global trade and financial integration also shape the economic environment, affecting the flexibility available for monetary and fiscal policies (Blanchard, 2019 and 2022).

On the other hand, some factors can quickly change the zone of stability. External shocks, such as sudden rises in commodity prices, are examples. Confidence effects, like the public’s trust in the government’s ability to manage the economy, can also change rapidly, shrinking the space for effective policies. A sharp drop in exchange rates is often an early sign of lost confidence, which limits the government’s ability

to manage its policies (Cavallino and Sandri, 2023; Bianchi and Lorenzoni, 2022).

In recent decades, the financial system has become more complex and fragile, increasing the chances of quick changes in the stability zone. High levels of debt and liquidity mismatches can lead to sudden losses of confidence, triggering bank takeovers and market crashes. This fragility narrows the range of policy options that investors trust, making the zone of stability smaller.

Other policies, beyond fiscal and monetary ones, also impact the zone of stability. For example, financial regulations (macro-prudential and micro-prudential) help prevent financial excesses and provide safety nets, giving more room for fiscal and monetary policies. In some cases, managing capital flows and intervening in foreign exchange markets can strengthen the economy’s resilience and increase flexibility in policy-making. Structural reforms that boost economic growth and reduce pressure on monetary and fiscal policies can also expand the zone of stability (Farhi and Werning, 2016; Bergant, 2023).

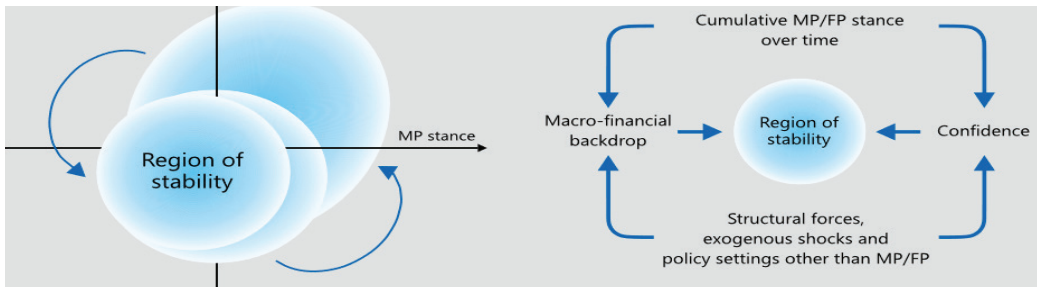
The Region of Stability

1A

A. Nature of the regional of stability

B. Factors inducing the region of stability

Source: - Bank of International Settlement, 2023



THE MODEL

The model, based on earlier work by Aiyagari and Gertlet (1985), looks at different types of fiscal regimes, using a measure called δ to describe them. There are two main scenarios:

1. Ricardian Regime ($\delta = 1$): In this scenario, the central bank operates independently and does not directly support government debt. When the government sells debt, it plans to cover the debt through future taxes or spending cuts. This means the central bank doesn't interfere, and the government's debt grows in line with the budget deficit.

2. Non-Ricardian Regime ($\delta = 0$): Here, the central bank fully supports government debt and cooperates with the fiscal authority whenever the government funds a budget deficit with debt. In this case, the fiscal authority doesn't adjust taxes or spending based on the debt, and the central bank increases its revenue from printing money (seigniorage) to cover the debt payments.

It's hard to tell apart these regimes just by looking at long-term correlations between interest rates and money growth because monetary policy rules can make Non-Ricardian and Ricardian regimes look similar.

Research finds that in OECD countries, central banks are more likely to be independent ($\delta = 1$), while in developing countries, fiscal authorities often dominate ($\delta = 0$). This means in OECD countries, government debt doesn't significantly affect prices because the fiscal authority supports most of the debt, unlike in developing countries.

The coefficient δ measures how much the fiscal and monetary authorities depend on each other and indicates whether the government relies on fiscal or monetary support for its debt.

$$M_t = \frac{\gamma}{1-\beta} C_t - (1-\delta)\beta_t \quad | \quad 4$$

Where nominal private consumption is represented by $C_t \equiv p_t c_t$. We add the central bank independence index and form the following equation since the function of an independent central bank in the coordination process cannot be overlooked;

$$M_t = \alpha_0 + \alpha_1 C_t + \alpha_2 \beta_t + \alpha_3 CBI + e_t \quad 5$$

The above equation 5 will be changed to look like this:

$$M_t = \frac{\gamma}{1-\beta} C_t - (1-\delta)\beta_t - (1-\lambda)CBI \quad 6$$

α_0 is an intercept term, α_1 , α_2 and α_3 are constant coefficients and e_t is an error term. The model's structural parameters are as follows:

$$\alpha_1 = \frac{\gamma}{1-\beta}; \alpha_2 = -(1-\delta) \text{ and } \alpha_3 = -(1-\lambda) \quad 7$$

In the model, variables like the monetary base (M_t), private consumption (C_t), central bank independence (CBI), and government debt (β_t) are all connected to each other. If these variables were stable (stationary), estimates from the model could be incorrect. However, if these variables are not stable (non-stationary) and follow a specific long-term relationship (co-integration), then the estimates can be very accurate.

To check this, we use the Augmented Dickey-Fuller (ADF) test to see if these variables are non-stationary. The test looks at whether the variables have a “unit root” (which means they are non-stationary). According to the ADF test results, M_t , C_t , β_t , and CBI are non-stationary at their original levels but become stationary when we take their second difference.

The Johansen test then examines if these variables move together in the long term (co-integration). The results show that M_t , C_t , β_t , and CBI are co-integrated, meaning they have a long-term relationship. This confirms that the null hypothesis of no co-integration can be rejected at a 5% significance level.

Ho = There is a coordination of MP and FP in Pakistan.

H1 = There is no coordination of MP and FP in Pakistan.

THE DATA

The data of selected variables from 1970 to 2022 is obtained from State Bank of Pakistan’s annual report of 2023 and World Bank Meta Data file.

TABLE. 1 ADF UNIT ROOT TEST

Government Debt			Private Consumption()			Monetary Base		
Lags	t-Stats	P-Value	Lags	t-Stats	P-Value	Lags	t-Stats	P-Value
L(2)	-6.4004***	0.000	L(1)	-7.598***	0.000	L(1)	-5.6452***	0.000

Dependent Variable: Monetary Base:

Variables	Coeff	t-Stat	P-Value
()	0.076732	3.281719	0.03794
()	-0.095250	-2.635667	0.05280
(CBI)	7.647330	13.50450	0.0000

No of observations

51

Level of Significance

95%

R2

0.66087

Estimation of Structural Parameters

$$\alpha_2 = -(1 - \delta)$$

$$-0.095250 = -1 + \delta$$

$$\delta = 1 - 0.095250$$

$$\delta = 0.90475$$

$$\alpha_3 = -(1 - \lambda)$$

$$7.647330 = -1 + \lambda$$

$$\lambda = 1 + 7.647330$$

$$\lambda = 8.647330$$

Discussion of the results

The results show that private consumption and central bank independence have a positive effect on the monetary base, while government debt has a negative effect. All these relationships are statistically significant at a 95% confidence level.

We use coefficients from the model to estimate two key parameters, δ and λ . The results indicate that δ (which measures the coordination between monetary and fiscal policy) is close to 1, at 0.90475. This means there is strong coordination between the two policies. The parameter λ , at 8.647330 (greater than 1), suggests that the central bank is actively working with the fiscal authority to stabilize the economy.

These findings align with the Ricardian Regime described by Sargent (1982) and Aiyagari and Gertlet (1985), where the central bank and fiscal authority work together closely. In this scenario, the central bank sells government debt while the fiscal authority ensures the debt is supported through future taxes or spending cuts. This results in zero fiscal dominance and a high level of central bank independence.

Therefore, we do not reject the idea that monetary and fiscal policies are well-coordinated in Pakistan.

CB INDEPENDENCE AND MACROECONOMIC PERFORMANCE

According to the literature, fiscal policy dominates monetary policy in developing nations in four ways: 1) Monetizing the deficit through central bank loans at zero cost of funds. 2) Taking out loans at interest rates lower than market rates by forcing debt onto captive purchasers, typically from commercial banks. 3) Borrowing from overseas in foreign currencies and 4) Borrowing from willing domestic private-sector lenders at market interest rates (Cukierman, 1992).

In the context of a central bank index, loans, advances, and credit to the private sector—which is essential to the expansion of the economy—are used to assess Pakistan's macroeconomic performance. The projected value of δ indicates that Pakistan operates under a Ricardian regime.

In the whole process government in the presence of a dependent central banker borrows from commercial banks by issuing government securities for investment purpose and earning risk free rate of return. This will decrease the Bank's ability to lend more to the private sector and hampering the growth of the economy. For the purpose of estimation, the following model is proposed:

$$\text{Where } GDP_t = \alpha_1 + \alpha_2 GD_t + \alpha_3 ML_t + \alpha_4 CBI_t + \alpha_5 CP + \varepsilon_t$$

GDP is gross domestic product in millions of rupees.

GD is total gross government debt outstanding in millions of rupees.

ML is total loans obtained by the government from market in millions of rupees.

CP is Commercial Bank’s credit to private sector in millions of rupees.

CBI is central bank independence index.

DATA

The data of , , and from 1970-2022is gathered from the SBP annual reports and World Bank’s meta data country excel file.

METHODOLOGY

To check if the variables Government Debt (GD_t), Central Bank Policy (CP_t), GDP, and Money Supply (ML_t) are stable, we use the Augmented Dickey-Fuller (ADF) unit root test. This test examines whether these variables have a “unit root,” which would mean they are non-stationary.

The ADF test results show that GD_t, CP_t, GDP, and ML_t are non-stationary when looked at in their original form. However, when we take the second difference of these variables, they become stationary. This means we can reject the idea that these variables have a unit root once we make this adjustment.

TABLE.2 ADF UNIT ROOT TEST

Government Debt (GD)			Credit to Private Sector (CP)			Market Loans (ML)			Gross Domestic Product (GDP)		
Lags	t-Stats	P-Value	Lags	t-Stats	P-Value	Lags	t-Stats	P-Value	Lags	t-Stats	P-Value
L(1)	-6.404***	0.000	L(2)	-3.0515**	0.0384	L(2)	-3.968**	0.0038	L(2)	-3.0515**	0.0384

See. Annexure B for complete results.

Dependent variable: Gross Domestic Product

Variables	Coef	t-Stat	P-Val
(GD)	-0.114635	-3.144023	0.0029
(CP)	0.934512	22.95361	0.0000
(ML)	0.311489	6.970731	0.0000
(CBI)	-16.57862	-18.36498	0.0000

No of observations 51
 Level of Significance 95%
 R2 0.997360

Discussion of the results

The results indicatenegative association of Government Debt (), positive association of Credit to Private Sector (), positive association of Market Loans ()and negative association of Central Bank Independence (with Gross Domestic Productand are statistically significant at 95% level of significance.

Our results corresponds to the earlier studies of Cukierman (1992), wherein fiscal policy dominates monetary policy through 1) Monetizing the deficit through central bank loans at zero cost of funds, 2) Taking out loans at interest rates lower than market rates by forcing debt onto captive purchasers, typically from commercial banks, 3) Borrowing from overseas in foreign currencies and 4) Borrowing from willing domestic private-sector lenders at market interest rates.

CONCLUSION

Research indicated that when the interests of the two authorities diverge, central bank independence increases the likelihood of conflicts with the government, which deteriorates macroeconomic performance overall. However, every study stressed the significance of sustainable growth in the framework of price stability and viable national accounts. All things considered, we still don't fully comprehend how the independence of central banks affects economic performance.

Institutional and operational concerns are brought up by the monetary and fiscal policy coordination. In order to achieve the shared national goal and in accordance with preferences, both policies call for the necessary institutional and operational procedures. There are a few prerequisites that must be met before one or both of the policies can become more autonomous. This calls for the division of duties, one of which is the creation of a market for government securities, wherein forces of the market would dictate the terms of financing a budget deficit.

REFERENCES

Aiyagari, S. R., & Gertler, M. (1985). The backing of government bonds and monetarism. *Journal of Monetary Economics*, 16(1), 19-44.

Altunbas, Y., and J. Thornton. 2022. 'Does Inflation Targeting Increase Income Inequality?' *Journal of Post Keynesian Economics*, 45 (4): 558–580.

Andersen, Torben M., and Friedrich Schneider. "Coordination of fiscal and monetary policy under different institutional arrangements." *European Journal of Political Economy* 2, no. 2 (1986): 169-191.

Ball, L., & Sheridan, N. (2005). Does inflation targeting matter? [Bernanke, B.S. and Woodford, M. (eds), *The Inflation-Targeting Debate*. Chicago: University of Chicago Press.

Bank of International Settlement. Annual Economic Report June 2023.

Bartolomeo, G. D., & Gioacchino, D. D. (2004). Fiscal-monetary policy coordination and debt management: A two stage dynamic analysis.

Bartsch, Elga, Agnès Bénassy-Quéré, Giancarlo Corsetti, and Xavier Debrun. 2020. 'It's All in the Mix: How Monetary and Fiscal Policies Can Work or Fail Together.' Geneva: ICMB International Center for Monetary and Banking Studies London: CEPR Centre for Economic.

Bergant, K, F Grigoli, N Hansen and D Sandri (2023): “Dampening global financial shocks: can macroprudential regulation help (more than capital controls)?”, BIS Working Papers, no 1097.

Bianchi, J and G Lorenzoni (2022): “The prudential use of capital controls and foreign currency reserves“, in G Gopinath, E Helpman and K Rogoff (eds), Handbook of international economics, vol 6, North-Holland.

Blake, A.P., Kirsanova, T. (2011). Inflation Conservatism and Monetary-Fiscal Policy Interactions. International Journal of Central Banking.

Blanchard, O (2019): “Public debt and low interest rates”, American Economic Review, vol 109, no 4, pp 1197–229.——— (2022): Fiscal policy under low interest rates, MIT Press.

Borio, C and P Disyatat (2021): “Monetary and fiscal policy: privileged powers, entwined responsibilities“, SUERF Policy Note, no 238.

Cavallino, P and D Sandri (2023): “The open-economic ELB: contractionary monetary easing and the trilemma“, Journal of International Economics, vol 140, January.

Cukierman, A. (1992). Central bank strategy, credibility and independence: Theory and evidence: Cambridge MIT Press.

Debelle, G., & Fischer, S. (1994). How independent should a central bank be?. In Conference Series;[Proceedings] (Vol. 38, pp. 195-225). Federal Reserve Bank of Boston.

Dincer., N.Nergiz & Eichengreen, Barry (2012). Central Bank Transparency and Independence. Updates and New Measures. International Journal of Central Banking.

Dixit, A., & Lambertini, L. (2003). Interactions of commitment and discretion in monetary and fiscal policies. American economic review, 93(5), 1522-1542.

Farhi, E and I Werning (2016): “A theory of macroprudential policies in the presence of nominal rigidities“, Econometrica, vol 84, no 5, pp 1645–704.

Fischer, S. (1993). The role of macroeconomic factors in growth, Journal of Monetary Economics, 32(3), 485-511.

Goodfriend, M. (2011). Central banking in the credit turmoil: An assessment of Federal Reserve practice. Journal of Monetary Economics, 58(1), 1-12.

Grilli, V., Masciandaro, D., & Tabellini, G. (1991). Political and monetary institutions and public financial policies in the industrial countries. Economic

policy, 6(13), 341-392.

Hansen, Bent (1958). *The Economic Theory of Fiscal Policy*.

Jalal Qanas & Malcolm Sawyer (2023) 'Independence' of Central Banks and the Political Economy of Monetary Policy, *Review of Political Economy*, DOI:

Khan, N. 2022. 'Does Inflation Targeting Really Promote Economic Growth?' *Review of Political Economy* 34 (3): 564–584

Masciandaro, D., & Tabellini, G. (1988). Monetary regimes and fiscal deficits: a comparative analysis. In *Monetary Policy in Pacific Basin Countries: Papers Presented at a Conference Sponsored by the Federal Reserve Bank of San Francisco* (pp. 125-152). Dordrecht: Springer Netherlands.

Niemann, S., Pichler, P., & Sorger, G. (2013). Central bank independence and the monetary instrument problem. *International Economic Review*, 54(3), 1031-1055.

Park, Seok G. (2015). Central Banks' Quasi-Fiscal Policies and Inflation. *International Journal of Central Banking*.

Parkin, M. (1987). *Monetary Policy and Aggregate Fluctuations*.

Qanas, J., & Sawyer, M. (2023). 'Independence' of Central Banks and the Political Economy of Monetary Policy. *Review of Political Economy*, 1-16.

Sargent, T. J., & Wallace, N. (1981). Some unpleasant monetarist arithmetic. *Federal reserve bank of minneapolis quarterly review*, 5(3), 1-17.

Semmler, W., & Zhang, W. (2003). Monetary and fiscal policy interactions: Some empirical evidence in the Euro-Area. Manuscript.

Sims, C. A. (2016, August). Fiscal policy, monetary policy and central bank independence. In *Kansas Citi Fed Jackson Hole Conference* (pp. 1-17).

Stefan, Niemann., Pichler, Paul., & Sorger Gerhard (2013). Central bank independence and the monetary instrument problem. *International economic review*.

Walsh, Carl, E. (2011). Central Bank Independence Revisited. *Economic Papers*, Vol. 30, No. 1, March, 2011, 18–22