Does Monetary and Macroprudential Policies Matters for Financial Stability in Case of Pakistan?

Muhammad Hamza Amjad[1]   **Supervised by: Dr. Hafsa Hina (PIDE)**

Key Messages

- Increase in money supply (expansionary quantitative monetary policy) promotes the output growth, while the decrease in money supply (tightening quantitative monetary policy) can help to maintain the price stability.
- Decrease in Interest rate (expanding price-based monetary policy) helps to promote the output growth. Increase in interest rate (tightening price-based monetary policy) effectively stabilize the prices (Inflation).
- SBP implements the tightening monetary policy when facing high price level and increase in growth rate and vice versa.
- For financial stability SBP use the macroprudential policies because these policies maintain the stability in the financial system, as a well-functioning and stable financial system is crucial to the health of a country's real economy.
- In addition, macroprudential policy should be used in conjunction with monetary policy to maintain financial stability.

Introduction

Monetary policy and macroprudential instruments are two primary categories of policy instruments that affect the financial condition of the economy. The interest rate or policy rates are eminent instruments of monetary policy, while macroprudential policies have lately resurfaced and are a tool that is becoming more active [1]. The financial crisis of 2007-2008 and its enduring impact have prompted a significant reassessment of the prevailing macroeconomic policy framework that had seemingly effectively stabilized the economy during the Great Moderation era.

Firstly, it compelled a reconsideration of monetary policy frameworks, which had primarily emphasized maintaining "price stability". This shift occurred because it became evident that price stability alone was insufficient to ensure "financial stability", and the absence of financial stability could trigger substantial adverse effects on price stability. Secondly, it starts the debate on a new area of policy known as "Macroprudential Policy", which was stimulated by the immediate contribution of [2] and the Bank for International Settlements (BIS). This approach recognized that safeguarding the soundness and safety of individual financial institutions was insufficient to guarantee overall financial system stability.

Macroprudential Policy

According to a widely accepted definition *"Macroprudential policies are designed, to identify and mitigate risks to systemic, stability, in turn reducing the cost to the economy from a disruption in, financial services that underpin the workings of financial markets - such as the provision of credit, but also of insurance and payment and settlement services"* [3].

Macroprudential policy is defined as the use of primarily prudential tools to limit systemic risk and is concerned with crisis prevention [4]. Macroprudential policy, as a comprehensive approach, evaluates how the actions of individual financial institutions impact the overall macroeconomic situation and the

---

interconnectedness among different institutions. These activities have the potential to pose certain risks to national financial stability. Even though certain banks may undertake activities or policies that appear responsible and conservative within their own context, they can have a broader influence on other banks and the entire economy. Therefore, macroprudential policy serves as a crucial element in bridging the gap between traditional microprudential policies and macroeconomic policies.

Macroprudential tools are new, and little is known about how effective they can be. They are exposed to circumvention and subject to thorny political economy constraints [5]. Macroprudential policies have proven to be effective in mitigating fluctuations in credit and asset prices. However, it is crucial to acknowledge that implementing such policies involves making explicit tradeoffs between systemic risk and economic growth. To accurately assess these tradeoffs, it is necessary to employ appropriate frameworks of analysis to quantify their impact.

Monetary and Macroprudential Policies

Monetary policy and macroprudential policy employ instruments that operate through the financial system and can give rise to significant interactions between the two. The preservation of financial stability can be effectively addressed by employing both conventional monetary policy interventions and macroprudential policy interventions. However, given its targeted approach, macroprudential policy should be regarded as the primary defense against the emergence of systemic financial vulnerabilities [6].

The global financial crisis 2007-2008 had a severe impact on Pakistan's economy, leading to significant macroeconomic imbalances and a decline in the GDP growth rate. The GDP growth rate dropped from 6.8% in 2007 to a mere 4.1% in 2008, highlighting the country's poor economic performance. The fiscal and current-account deficits also rose to their highest levels,

reaching 7.4% and 8.4% of GDP, respectively. Pakistan's economic performance over the past several decades has been episodic—and the prospects for strong, sustainable, and inclusive growth still seem distant. Economic growth has been characterized by boom-and-bust cycles, and the country has not been successful in sustaining its episodes of high growth [7,8].

The presence of an asymmetric relationship implies that economic growth responds differently to financial reforms in the pre-reform and post-reform periods. It also suggests that changes in financial policies may have varying effects on the finance-growth relationship depending on the state of policy intervention [9]. It can be argued that when macroeconomic variables exhibit different behaviors due to regime shifts, linear models may inadequately explain the impact of policy changes. Despite the crucial role of policy changes in the finance-growth relationship, there has been limited research exploring the nonlinear effects of financial reforms on economic growth in the context of Pakistan.

Transmission Mechanism
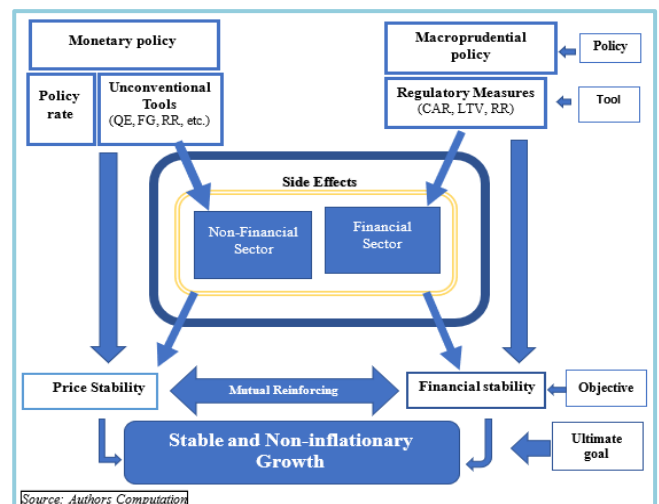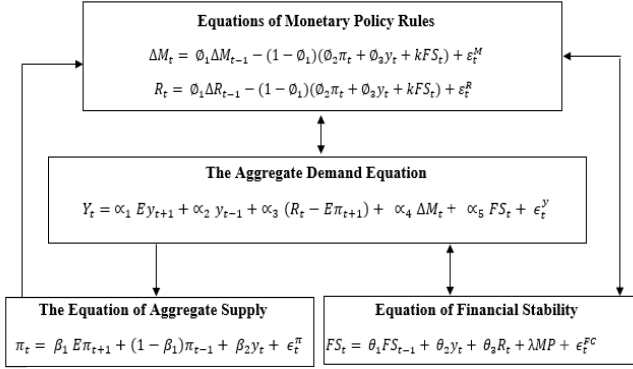

Source: Authors Computation

Figure shows the transmission channels of monetary and macroprudential policies. The tools of monetary policy are policy rate and unconventional tools which affect non-financial sector with the objective price stability. On the other side, the tools of macroprudential policies are the any regulatory measures taken by the country's central bank with the objective of financial stability and it only affects the financial sector. The objective of macroprudential policies is financial stability. Both policies have

different objectives but their mutual enforcement is necessary to achieve of price stability and financial stability. The ultimate goal of the both polices is stable and non-inflationary growth.

Theoretical Framework

Equations of Monetary Policy Rules

$$\Delta M_t = \emptyset_1 \Delta M_{t-1} - (1-\emptyset_1)(\emptyset_2 \pi_t + \emptyset_3 y_t + kFS_t) + \varepsilon_t^M$$

$$R_t = \emptyset_1 \Delta R_{t-1} - (1-\emptyset_1)(\emptyset_2 \pi_t + \emptyset_3 y_t + kFS_t) + \varepsilon_t^R$$

The Aggregate Demand Equation

$$Y_t = \alpha_1 E y_{t+1} + \alpha_2 y_{t-1} + \alpha_3 (R_t - E\pi_{t+1}) + \alpha_4 \Delta M_t + \alpha_5 FS_t + \epsilon_t^y$$

The Equation of Aggregate Supply

$$\pi_t = \beta_1 E\pi_{t+1} + (1-\beta_1)\pi_{t-1} + \beta_2 y_t + \epsilon_t^\pi$$

Equation of Financial Stability

$$FS_t = \theta_1 FS_{t-1} + \theta_2 y_t + \theta_3 R_t + \lambda MP + \epsilon_t^{FC}$$

Source: (Sui *et al*., 2022) [10]

By analyzing this theoretical framework, monetary and macroprudential policies should be adopted selectively based on different circumstances the information on prices in the market, output, and financial conditions by the central bank. The interest rate and money supply are affected by the monetary policy which in turn has an impact on economic growth, the stability of price, and financial stability. The macroprudential policy instrument is utilized to minimize financial risks and boost the financial system's resilience.

Methodology

The Markov Switching Causality-Vector Error Correction (MSC-VEC) model is used to check the relationship between the monetary policy, macroprudential policies, macroeconomy, and the financial stability.

$$\begin{pmatrix} \Delta Y_{1,t} \\ \Delta Y_{2,t} \end{pmatrix} = \begin{pmatrix} \mu_{10} S_{1,t} \\ \mu_{20} S_{2,t} \end{pmatrix} + \sum_{k=1}^{p} \begin{pmatrix} \alpha_{11}^{(k)} S_{1,t} & \beta_1^{(k)} S_{1,t} \\ \beta_2^{(k)} S_{2,t} & \alpha_{22}^{(k)} S_{1,t} \end{pmatrix} \begin{pmatrix} \Delta Y_{1,t-k} \\ \Delta Y_{2,t-k} \end{pmatrix} + \begin{pmatrix} \varphi_1 S_{1,t} \\ \varphi_2 S_{2,t} \end{pmatrix} ecm_{t-1} + \begin{pmatrix} \epsilon_{1,t} \\ \epsilon_{2,t} \end{pmatrix}$$

$$\begin{pmatrix} \epsilon_{1,t} \\ \epsilon_{2,t} \end{pmatrix} \sim \text{i.i.d.N} \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{1S_{1,t}}^2 & \rho\sigma_{1S_{1,t}}\sigma_{2S_{1,t}} \\ \rho\sigma_{1S_{1,t}}\sigma_{2S_{2,t}} & \sigma_2^2 \end{pmatrix} \right)$$

The aforementioned model features, $\Delta Y_{1,t}$ as the monetary variable lag, $\Delta Y_{2,t}$ as the macroeconomic variable, and ecm_{t-1} is error correction term which tells the short-term deviation. The coefficients for the error correction term are denoted by φ_1 and φ_2, respectively.

Relationship between Money supply and Macroeconomic variables

Parameter	GDP → M	P→M	FS→M	Parameter	M→GDP	M→ P	M→FS
Regime 1							
μ_{10}	-0.0391 (0.0995)	0.099 (0.1569)	–	μ_{20}	0.1859 (0.1057)	-0.1460 (0.1702)	–
α_{11}^1	-0.0188 (0.0205)	0.1209** (0.1130)	-2.5402 (4.7028)	α_{21}^1	0.058** (0.0219)	0.8033*** (0.1540)	2.5450** (2.0711)
β_1^1	0.3121*** (0.0685)	0.013*** (0.0053)	1.2287 (1.7694)	β_2^1	0.0908 (0.0737)	-0.0414** (0.0069)	0.7665 (0.7792)
φ_1	0.0021*** (0.0021)	–	–	φ_2	0.9968*** (0.0023)	–	–
Regime 2							
μ_{10}	2.1086 (0.4223)	0.9737*** (0.2223)		μ_{20}	-0.5551** (0.5448)	0.0193 (0.2508)	
α_{11}^1	-0.0344*** (-0.065)	0.180*** (0.2224)	-0.0085 (0.0818)	α_{21}^1	0.3109*** (0.0703)	0.8009*** (0.3223)	-0.030** (0.0361)
β_1^1	0.0017*** (0.3824)	-0.0005* (0.0119)	-0.3957 (0.1733)	β_2^1	2.4421*** (0.5206)	0.0529*** (0.0135)	0.7831 (0.0763)
φ_1	0.0074*** (0.0065)	–	–	φ_2	1.0478*** (0.0075)	–	–
Probabilities							
Parameters	**(GDP, M)**		**(P, M)**		**(FS, M)**		
p_{11}	0.8940		0.7703		0.0180		
p_{00}	0.10593		0.2296		0.9819		

Note: This table shows the results of the MSC-VEC. ***, **, and * denote significant at 1%, 5%, and 10% significance level, respectively. The values in parentheses are the standard deviations of the corresponding parameter estimates.

The table above show the causal relationship between money supply and macroeconomic variables. An increase in the money supply is associated with heightened volatility in financial markets and a decline in financial stability. The inflationary impact of an expanded money supply further complicates investment decision-making for borrowers [11], as it introduces higher risks and asymmetric information. Consequently, the increased volatility in the financial markets prompts a response from the central bank, which in turn increases the money supply. While the expansion of the money supply negatively impacts financial stability, it does contribute to output growth and it is positively related to output growth [12] finds the positive relationship between the output growth and money supply.

Relationship between Interest Rate and Macroeconomic variables

The price impact of market interest rates implies that an increase in market interest rates might contribute to the maintenance of low or stable prices. The depreciation of investments is a probable consequence of sustained periods of low prices in the long run. The quick depreciation of credit assets inside financial institutions can lead to liquidity challenges within the financial system, subsequently resulting in a contraction of credit and ultimately causing financial swings. In order to mitigate the potential negative impact of the "financial

accelerator" phenomenon on the real economy, the central bank has the option to adopt an expansionary monetary policy focused on price adjustments. This approach involves injecting liquidity into the market. Furthermore, the coefficient of the causal influence of financial stability with a lag of four periods on the current market interest rate is shown to be considerably positive. Moreover, the magnitude of this coefficient is bigger than that of the coefficients associated with other lag periods. This implies that in the presence of financial uncertainty, the central bank retains the option to increase the interest rate. While the impact of rising market interest rates on financial stability may not be advantageous, it can contribute to the preservation of price stability. Inflation is frequently observed in conjunction with an unstable financial market. To mitigate inflationary pressures, the central bank may opt to increase interest rates. In other terms, the primary aim of a price-based monetary policy is to sustain price stability, as opposed to prioritizing the preservation of financial stability. The table below show the causal relationship between money supply and macroeconomic variables.

Relationship between CAR, LTD and Financial Stability

Parameter	FS → CAR	FS →LTD	Parameter	CAR → FS	LTD → FS
Regime 1					
μ_{10}	–		μ_{20}	–	–
α_{11}^1	0.0802*** (0.0711)	0.3025*** (0.2056)	α_{21}^1	-0.0330*** (0.0584)	0.1988*** (0.0997)
β_1^1	0.0203*** (0.1566)	0.0571*** (0.44587)	β_2^1	0.0695*** (0.1286)	0.0535*** (0.2179)
φ_1	–		φ_2		–
Regime 2					
μ_{10}	–	–	μ_{20}		–
α_{11}^1	-0.2513*** (0.6976)	-1.42E-05 (0.1508)	α_{21}^1	0.0363*** (0.3562)	0.0868** (0.0701)
β_1^1	5.2819*** (0.4617)	0.4473*** (0.3702)	β_2^1	0.4543*** (0.3768)	0.1693** (0.1628)
φ_1	–	–	φ_2		–
Probabilities					
Parameters	(CAR, FS)		(LTD, FS)		
p_{11}	0.9472		0.4615		
p_{00}	0.0527		0.5384		

Note: This table shows the results of the MSC-VEC. ***, **, and * denote significant at 1%, 5%, and 10% significance level, respectively. The values in parentheses are the standard deviations of the corresponding parameter estimates.

Parameter	GDP → R	P→R	FS→R	Parameter	R→GDP	R→ P	R→FS
Regime 1							
μ_{10}	0.7848*** (0.1495)	0.989*** (0.0045)	–	μ_{20}	24.5953*** (12.2015)	-0.3200 (0.2219)	–
α_{11}^1	-0.2706 (0.0981)	0.0559** (0.0222)	0.339987 (0.50660)	α_{21}^1	5.9688 (8.1944)	2.0222** (1.0961)	-13.4915 (5.3611)
α_{12}^2	-0.0153 (0.0053)	–	–	α_{22}^2	-1.5383 (0.4208)		
β_1^1	0.0016** (0.0014)	0.0007** (0.00029)	-0.1565 (0.0545)	β_2^1	-0.0506 (0.1198)	0.0134*** (0.0134)	-2.0331 (0.5636)
β_1^2	-0.0153 (0.0053)	–		β_2^2	-1.5383 (0.4208)	–	–
φ_1	0.0021** (0.0017)	0.002*** (0.0019)	–	φ_2	-0.1049 (0.1447)	0.2354*** (0.0913)	–
Regime 2							
μ_{10}	-0.4670 (0.0890)	1.0056** (0.0123)	–	μ_{20}	-3.4023 (6.9859)	-1.2655 (0.6001)	–
α_{11}^1	-0.5275 (0.1194)	0.0697** (0.0561)	0.0037 (0.1149)	α_{21}^1	-15.3808 (10.0669)	9.0763** (2.9558)	-2.1655 (1.2345)
α_{12}^2	0.0020** (0.0017)	–	–	α_{22}^2	0.3215*** (0.1410)		
β_1^1	0.0020 (0.0017)	0.0007** (0.00079)	0.0061 (0.0088)	β_2^1	0.3215** (0.1410)	0.1949*** (0.0340)	0.4114** (0.0940)
β_1^2	-0.0139 (0.0056)	–	–	β_2^2	1.3225 (0.4824)	–	–
φ_1	-0.0056 (0.0015)	-0.009** (0.0046)	–	φ_2	0.4441*** (0.1187)	0.2851*** (0.2087)	–
Probabilities							
Parameters	(GDP, R)			(P, R)		(FS, R)	
p_{11}	0.4596			0.8137		0.0705	
p_{00}	0.5403			0.1862		0.9294	

Note: This table shows the results of the MSC-VEC. ***, **, and * denote significant at 1%, 5%, and 10% significance level, respectively. The values in parentheses are the standard deviations of the corresponding parameter estimates.

Maintaining financial stability through the reduction of LTD is achieved by adopting a targeted regulatory approach that optimizes the liquidity structure. This approach ensures the overall stability of the banking system's liquidity, facilitating the healthy expansion of monetary credit and social financing. Consequently, it fosters a conducive monetary and financial environment, which in turn contributes to the stability of the financial system. The coefficients associated with CAR and LTD in relation to financial stability exhibit a significant negative correlation. This implies that a decrease in financial stability prompts the central bank to implement macroprudential tools that focus on liquidity and assets. These findings align with the principles of the "leaning against the wind" approach of macroprudential policy, which bears resemblances to monetary policy.

Policy Recommendations

- The SBP undertakes monetary policy actions that support a stable financial system and sustain price stability. These measures include controlling the money supply, changing the terms of loans, and altering interest rates. The SBP can choose the best stance for monetary policy to guarantee financial sector stability by closely monitoring production levels, inflation, and other macroeconomic variables.

- The SBP design the proper framework for monetary and macroprudential policy tools to reduce systemic risks and increase the financial system's resilience. These regulations and oversight of financial institutions, risk management frameworks, capital adequacy standards, and liquidity management are their primary areas of concern.

- By combining both policies through a proper transmission channel the SBP aims to achieve a balanced approach that safeguards both price stability and financial stability. This integrated policy framework allows for the effective management of risks and promotes the overall health and stability of the financial system in Pakistan.

Way Foreword

For future research in Pakistan, exploring the intricate interactions between monetary and macroprudential policies under domestic economic conditions, and assessing the effectiveness of recent regulatory reforms in promoting financial stability and growth, could provide actionable insights for policymakers and enhance the country's economic resilience.

Reference

1. Amjad, R. (2011). Economic Growth and Development: New Directions (The Presidential Address) - PIDE - Pakistan Institute of Development Economics.
2. Blanchard, O. J. (2014). Introduction: Rethinking Macro Policy II—Getting Granular. In *What Have We Learned? Macroeconomic Policy After the Crisis*. The MIT Press.
3. Blanchard, O. J. (2014). Introduction: Rethinking Macro Policy II—Getting Granular. In *What Have We Learned? Macroeconomic Policy After the Crisis*. The MIT Press.
4. Crockett, A. (2000a). *Marrying the micro- and macro-prudential dimensions of financial stability*.
5. FSB/IMF/BIS. (2009, November 7). *Guidance to Assess the Systemic Importance of Financial Institutions*.
6. Hina, H., Ahsan, H., & Afzal, H. (2022). *The Information in the Yield Spread for the Recession in the Case of Pakistan*. Pakistan Institute of Development Economics (PIDE), working paper.
7. IMF. (2013). *Key Aspects of Macroprudential Policy*. IMF.
8. Martin, A., Mendicino, C., & Van der Ghote, A. (2021). *On the Interaction between Monetary and Macroprudential Policies* (SSRN Scholarly Paper 3797147).
9. Rioja, F., & Valev, N. (2004). Finance and the sources of growth at various stages of economic development. *Economic Inquiry*, *42*(1), 127-140.
10. Sui, J., Liu, B., Li, Z., & Zhang, C. (2022). Monetary and macroprudential policies, output, prices, and financial stability. *International Review of Economics & Finance*, *78*, 212–233.
11. Liang, F. (2021). Analysis of the Relationship between Monetary Policy and Stock Market Liquidity. *Proceedings of Business and Economic Studies*, *4*(3), Article 3.
12. Atiq, F., Uddin, M., & Khan, I. (2020). The Impact of Key Macroeconomic Determinants on Pakistan's Economy. *Global Social Sciences Review*, *V*, 260–272.