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Monetary Policy and Banks' Investment Portfolio

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July 24, 2025

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Monetary Policy and Banks' Investment Portfolio

Sajjad Zaheer and Muhammad Amin Khan Lodhi¹

Abstract

This working paper studies the relationship between banks' investment portfolio and the monetary policy using disaggregated quarterly data of individual banks in Pakistan from June 2007 to June 2022. The study reveals that an expansionary stance of monetary policy improves the investment to asset ratio of the banks. However, following the constraints on government borrowing from the SBP in 2019, the banks' investment portfolio has grown, despite monetary tightening. The paper also finds that banks' investments increase with both the size of the bank and the non-performing loans growth, as banks rebalance their portfolios toward safer assets. Moreover, liquidity support by the SBP, through open market operations, has a positive impact on the banks' investments. Further, with the rise in inflation, the investment to asset ratio of the banks rises to protect the eroding value of cash. Conversely, the investment portfolio of the banks decreases with the increase in advances and the government borrowing from the SBP.

JEL Classification: E52, E58, G21.

Key Words: Monetary Policy, Central Banking, Banks

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Non-technical Summary

Banks in Pakistan mainly invest in government securities for reasons such as portfolio diversification, liquidity needs, and regulatory compliance. These investments also serve as a safer alternative during periods of economic stress and high loan defaults. Over the years, the banks in Pakistan have shown a growing preference for government securities, influenced by macroeconomic conditions, interest rate dynamics, and government borrowing needs.

Monetary policy influences banks' balance sheets by affecting reserves, deposits, loans, and investments. Easing monetary policy increases bank reserves and drives investment in securities, while tightening can lead to valuation losses, especially on mark-to-market assets. The case of Silicon Valley Bank's collapse demonstrates this risk. However, tighter monetary policy may also incentivize new investments in high-yield government securities while discouraging riskier loans.

Using quarterly data from June 2007 to June 2022, the study finds that an expansionary monetary policy stance improves the investment to asset ratio of the banks. Individual Bank-specific characteristics such as its size, non-performing loans, and injections via SBP's Open Market Operations positively influence investments, whereas increased lending reduces them. Macroeconomic factors like inflation increase investment ratios, while government borrowing from the SBP dampens bank investments. Following the constraints on government borrowing from the SBP in 2019, the bank's investment portfolio has grown, despite monetary tightening.

Islamic banks show no significant difference from their conventional counterparts in the way their investment portfolios react to monetary policy changes.

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1. Introduction

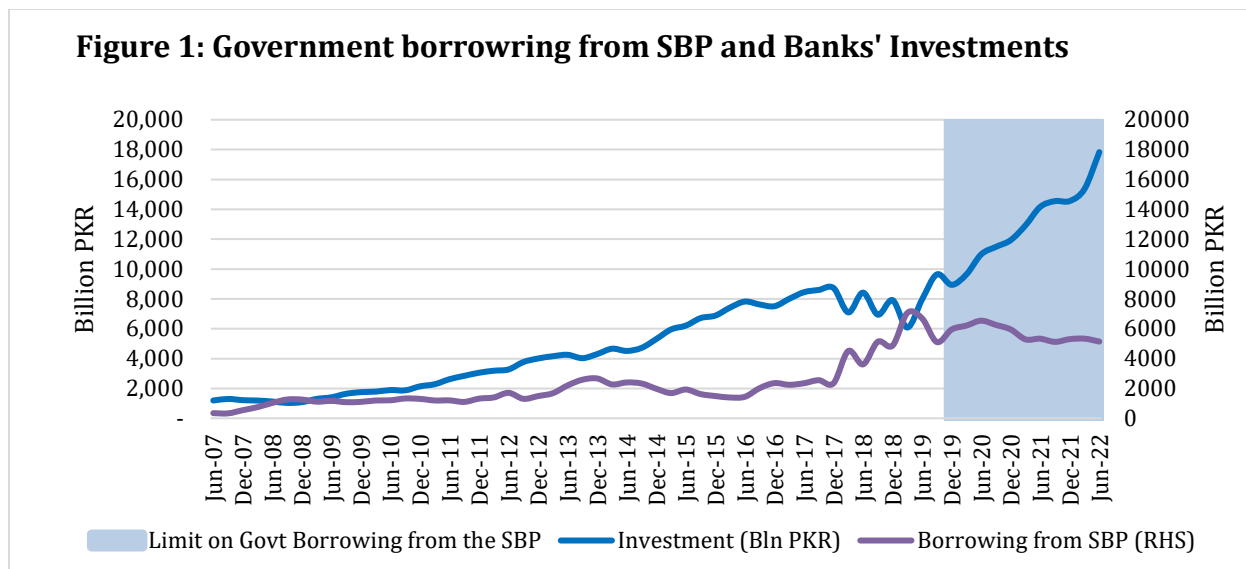
Banks invest in government securities for various reasons ranging from portfolio management and liquidity needs, to statutory regulatory requirements. Investment holdings of the banks are also considered as portfolio rebalancing to more secure and liquid assets in difficult periods amid increase in loan defaults. Moreover, investment in government securities can be due to the policies that channelize savings held in banks towards the public deficit financing. This can be done by issuing regulations, having direct control of banks and moral suasion (Becker and Ivashina, 2018).

Over the years, the banking sector in Pakistan has shown a significant inclination towards investing in government securities, thus improving the investment of the banks. This trend has been driven by various macroeconomic and financial factors. Over time, the investments in government securities have surged, reflecting the banks' preference for safer assets amidst favorable interest rate dynamics and economic uncertainties.

However, from March 2017 to March 2019, there has been a general decline in the banks' investment portfolio as the government retired its debt and rejected several bids in auctions of securities and bonds. This decline was mainly due to fact that the government used its option to borrow from the SBP to repay its debt to banks (**Figure 1**). The trend reversed subsequently when the government resorted to the IMF for Extended Fund Facility (EFF) program. In the wake of constraint on the government borrowing from the SBP, the same trend observed an increase. Accordingly, government borrowing from the scheduled banks rose, increasing the banks investment portfolio.

In 2020, banks' investment portfolio continued to increase, as banks sought to navigate economic disruptions due to the COVID-19 pandemic amid increased government financing needs. Overall, the continued investment in government debt instruments by the banks in Pakistan underscores the strategy to manage risks with stable returns amidst varying economic conditions. At the end of June 2022, the investment to asset ratio of banks in Pakistan increased to over 50 percent. The liquidity requirements of the money market also increased. Accordingly, the SBP conducted calibrated Open Market Operations (OMOs) as a main instrument for the implementation of monetary policy to steer interbank repo rate close to the policy rate within interest rate corridor (IRC) framework. The stock of SBP OMOs increased from around negative 1 trillion PKR in March 2019 to over 3 trillion PKR in June 2022.

Figure 1: Government borrowing from SBP and Banks' Investments



Monetary policy stance also alters the composition of the balance sheets of banks primarily by affecting reserves, deposits investments, and loans portfolio of the banks. Subsequent to an expansionary monetary policy stance amid increase in supply of liquidity by central bank, the banks have more reserves than were considered as adequate previously. Accordingly, they want to increase investments in government securities and issuance of credit. Conversely, when a central bank conducts an open market sale of bonds, it absorbs liquidity from the money market and reduces reserves in the market, potentially causing a contraction in investments and loans. (Blinder and Stiglitz, 1983). Drechsler, Savov and Schnabl (2017) demonstrate that a monetary tightening by Fed, increases the difference between the Fed rate and liquid deposits rates, resulting in outflows of deposits and a reduction in asset side of the banks’ balance sheet. In earlier studies, Bernanke and Blinder (1992) suggest that subsequent to a monetary tightening by Federal Reserve, bank holdings of securities drop immediately. Kashyap and Stein (1995) discovered that ease in monetary policy through rate decline by Fed, increases the security holdings by the financial sector.

Another effect of the monetary policy on investments comes through the securities which are re-priced, and marked-to-market. For instance, after a policy rate hike, the values of banks’ investment portfolio held in available for sale category will decrease owing to losses in the market value of such securities (Krainer and Paul, 2023). Failure of Silicon Valley Bank (SVB) is an example of this phenomenon, which developed renewed interest in examining the effect of monetary policy on investment portfolios of the banks. Due to the monetary tightening by Federal Reserve, SVB

experienced (unrecognized) losses in investment value of the bank.² This led to the collapse of SVB as uninsured depositors withdrew their funds, fearing the bank might not be able to honor withdrawals.³ IMF (2024) points out the similar risk, stating that the investment portfolios banks in Pakistan are exposed to valuation losses if interest rates increase, because approximately ninety percent of investment portfolio are in Available for Sale (AFS) and Held for Trading (HFT) categories. However, there are following factors that may lead to an increase in the investment portfolio of the banks as the interest rates go up after monetary tightening. High yields incentivize banks to invest in the newly issued government securities that may offset any contraction in previously held securities owing to repricing. Moreover, during high interest rate scenario, the demand for bank loans tend to decrease which leaves funds to be invested in government securities. The banks may also choose to invest in the government securities with no risk instead of extending loans, which are relatively riskier.

Accordingly, whether monetary policy affects the investment portfolio of the banks negatively or positively is an empirical question we attempt to address in this paper, using the disaggregated quarterly data of individual banks in Pakistan from June 2007 to June 2022.

² SVB experienced a swift rise in unrealized losses across both its held-to-maturity and available-for-sale (AFS) portfolios. According to the FDIC, U.S. banks held approximately USD620 billion in unrealized losses—assets that had declined in value but had not yet been sold—by the end of 2022, primarily due to rising interest rates. <https://www.federalreserve.gov/publications/2023-April-SVB-Evolution-of-Silicon-Valley-Bank.htm>.

³ Thus, a monetary tightening may lower the value of bonds acquired by the banks, impairing banks' capital, affecting the ability of banks to attract funds and, therefore, their capacity to extend loans may be reduced (Bernanke and Gertler, 1995).

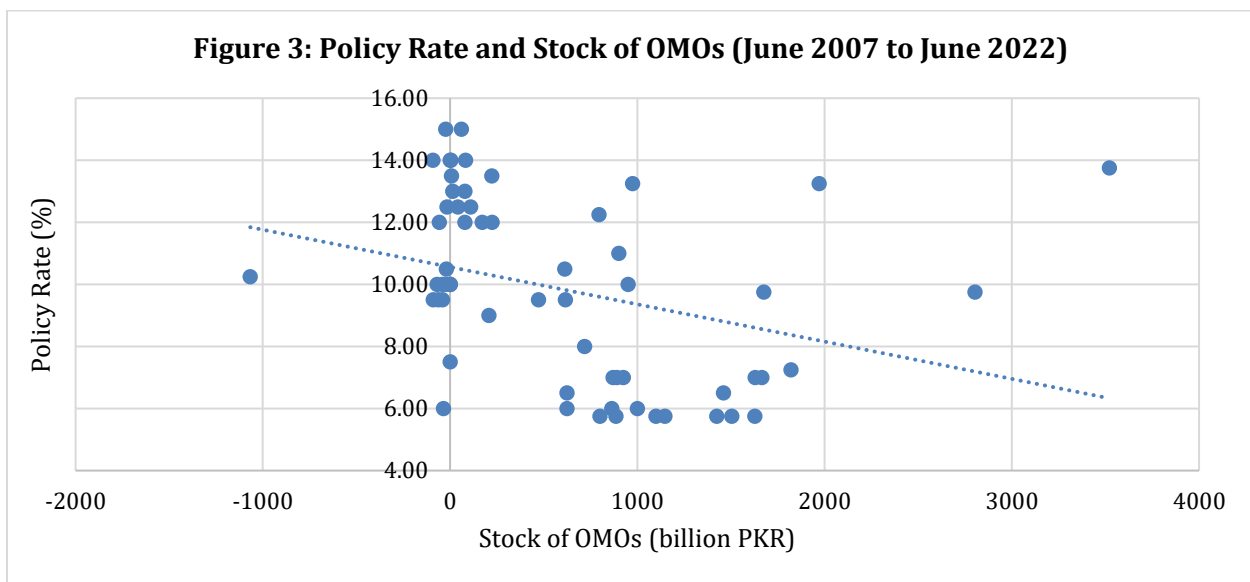
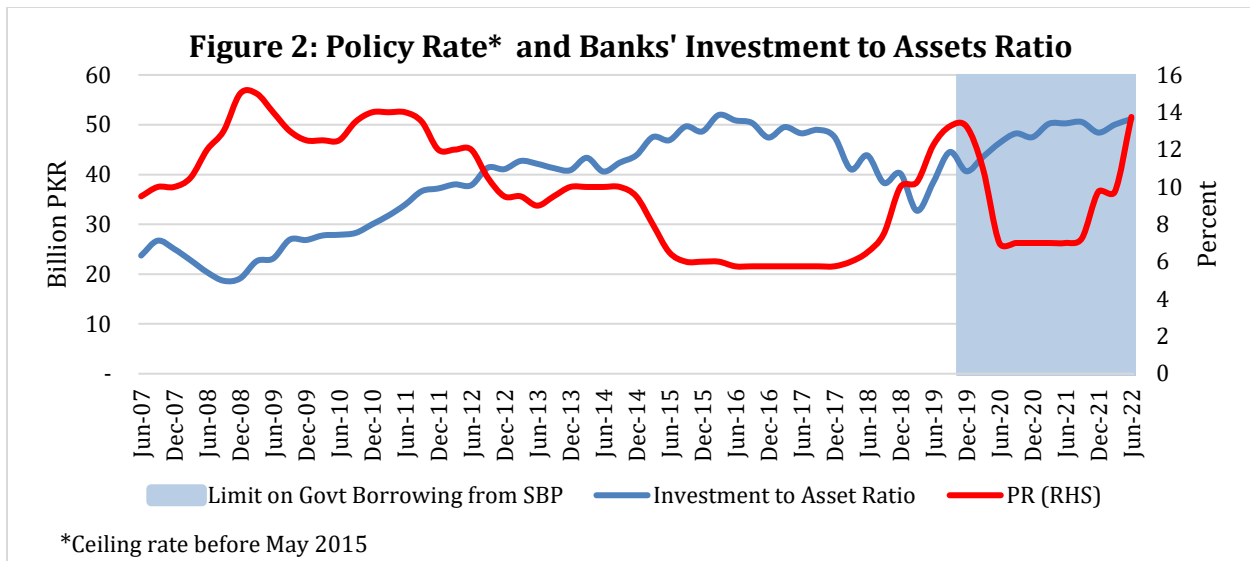


Figure 2 shows the association among policy rate and banks' investment to asset ratio in Pakistan. Apparently, there appears a negative correlation between the policy rate and investment portfolio of the banks. Moreover, during the period under review, a negative correlation is observed between policy rate and stock of open market operations (OMOs) (**Figure 3**). This may lead to contraction in the investment portfolio of the banks. However, empirical estimation is required to substantiate the relationship while controlling for other factors.

2. Empirical Literature

Using data of 66 countries, Dell’Ariccia et al. (2018) show that banks acquire huge volumes of public debt backed by government assurances, and soundness of banks and sovereigns is correlated with the business cycles. In an IMF study, using data of emerging market and developing economies (EMDEs) it is found that banks increase government securities when loan defaults are high, in accordance with the portfolio rebalancing premise (Bouis, 2019). Albertazzi, Becker, and Boucinha (2018), study this channel around the ECB’s quantitative easing (QE). They provide evidence that, in countries where there are macroeconomic imbalances with relatively high risk premia, QE was typically transmitted to increasing risky securities whereas in less weak countries with less constraints on demand for loans as well as their supply, the rebalancing was reflected mainly in terms of bank loans. Paludkiewicz (2018) also examines the impact of the unconventional monetary policy of the ECB on banks in Germany, and finds that banks facing large declines in yield of their bonds portfolio following unconventional monetary stance expands loans greater in relation to other banks. Moreover, he finds that banks experiencing high yield decline their government bond.

Diamond and Rajan (2011) and Shleifer and Vishny (2010) exhibit that banks can prefer purchasing securities instead of issuing credit in distress. Altavilla et al. (2017), Drechsler et al. (2016) and Acharya and Steffen (2015), employing data of euro area, discover that banks with low capital use the QE by the ECB to purchase greater risky government debt issued by Greece, Ireland, Italy, Portugal and Spain through the euro debacle. Some literature also assesses the effect of large asset purchases by the central banks on investment decisions of commercial banks (Chakraborty, Goldstein, MacKinlay 2020; Di Maggio, Kermani, and Palmer 2019 and Acharya et al. 2019).

The analysis of monetary policy and banks investment in securities is also important for bank lending channel of monetary policy via loan supply (Bernanke and Blinder, 1988; Bernanke and Blinder, 1992; Bernanke and Gertler, 1995; Kashyap and Stein, 2000; and Brunnermeier and Koby, 2017). Moreover, such analysis is crucial for the risk-taking channel of monetary policy (Adrian and Shin, 2010a; Maddaloni and Peydró, 2011; Jiménez et al., 2012; Chodorow-Reich, 2014; Bruno and Shin, 2015; Brunnermeier and Sannikov, 2013). Feyen and Zuccardi (2019), using data from 140 EMDEs suggest that the banks increase their exposure to the sovereigns with rising government debt and weak fiscal position.

Greenwald, Krainer, and Paul (2024) recently investigated how monetary policy is transmitted through bank investment portfolios in the United States. They present evidence that, during the 2022 monetary tightening cycle, banks that incurred greater market value losses on their securities

subsequently extended comparatively less credit to firms. Peydró et al. (2023) find that during periods of economic stress, following QE by the European Central Bank (ECB), less capitalized banks tend to shift from lending to increasing their holdings of securities. This substitution helps these banks strengthen their balance sheets.

3. Data

The study uses disaggregated quarterly data of individual banks in Pakistan reported to the SBP through Reporting Chart of Accounts (RCOA) from June 2007 to June 2022, covering 61 quarters. As of June 2022, out of 32 banks, there are 5 public sector banks, 4 foreign banks, 3 specialized banks and 20 local private banks. Among local private banks, there are 5 full-fledged Islamic banks (IBs). 17 conventional banks have both Islamic as well as conventional operations, whereas 10 banks are exclusively conventional banks (CBs).

Total assets of the banking industry reached Rs. 34.9 trillion at the end of June 2022 that are approximately 55 percent of the GDP.⁴ Banks' net investments comprise 42 percent of the assets followed by the advances (31 percent). Funding of the banks depends mostly on deposits, which reached Rs. 23.7 trillion i.e. 68 percent of the total liabilities, followed by borrowing from the financial institutions (20 percent). Around 48 percent of the banking assets are acquired by the five big banks.

Table 1 displays descriptive stats of key variables of the Pakistan's banking sectors and macroeconomic indicators in Pakistan.

4. Model Specification

To estimate the impact of monetary policy on the investment portfolio of the banking sector this article broadly follows Kashyap and Stein (1995) and the IMF working paper by Bouis (2019). Specifically, the study estimates equation (1).

$$I_{it} = \alpha_i + \sum_{j=1}^m \alpha_j I_{it-j} + \sum_{j=0}^m \beta_j \Delta PR_{t-j} + \sum_{j=0}^m \gamma_j B_{it} + \sum_{j=0}^m \gamma_j \Delta M_{it} + \varepsilon_{it} \quad (1)$$

where I_{it} is investments of bank i , in year-quarter t normalized by total assets, α_i is coefficient for bank fixed effects and ΔPR_{t-j} is the change in the policy rate. Changes in ceiling rate, also known as discount rate, is employed for the time-period before 2015. B_{it} are the bank-level features to control for an array of bank-specific time-changing characteristics which might affect the differences in

⁴ GDP at current prices for the FY2022 was Rs. 63.3 trillion
https://www.pbs.gov.pk/sites/default/files/tables/national_accounts/2021-22/Table_2.pdf

response to the monetary policy impulse across banks' investment. Specifically, we include growth in the size of a bank measured by its total assets, the non-performing loans growth, cash and advances normalized by total assets. The contemporaneous values of banking characteristics, such as advances and cash, might be endogenous to the model. Therefore, we use lagged values of these variables as explanatory variable. To control for the funding side, the deposit growth has also been included in the model.

M_t represents the macroeconomic variables used to control for the broader economic conditions that may influence the banks' investment portfolios. Particularly, we include inflation and large-scale manufacturing. Moreover, we also include open market operations by the central bank and growth in government borrowing from central bank to control for effect of central banking operations on banks investment portfolio.

These results may be altered by the constraints on the government borrowing from the SBP in the wake of EFF of the IMF availed by Pakistan in FY2020. In this scenario, the government had to rely on the banking sector to meet its budget deficit. Thus, there is a possibility that the investments in government securities would increase amid monetary tightening suggesting a positive relationship between investment to asset ratio and policy rate change. To disentangle this impact, a dummy variable named 'IMF' is introduced in this study. This variable is '1' after the IMF program in FY2020 and zero otherwise. The dummy variable is then interacted with the policy rate change to see the differential impact of the monetary policy on the investment to asset ratio after the IMF program.

To isolate the effect of monetary policy on the investment portfolios of Islamic banks, we introduce a dummy variable IBI_i , which captures both standalone Islamic banks and Islamic banking branches within mixed banks. This dummy takes the value of '1' for Islamic banking operations and '0' otherwise.

5. Results

The results are shown in Table 2. *Model 1*, which is estimated without any control variables. They show that monetary policy easing improves the investment portfolio of the banks and vice versa. The findings are similar to those of Kashyap and Stein (1995) and Bernanke and Blinder (1992). The coefficient of policy rate change is negative and statistically significant for investments to total assets of the banks. More specifically, a one-percentage-point monetary easing increases the investment-to-asset ratio of the banks by 0.83 points.

Model 2 includes bank level characteristics and macroeconomic variables that may affect the investment portfolio of the banks. The results show that a one-percentage point decrease in the policy rate change increases the investments to asset ratio of the banking institutions by 0.94 points. In absolute term, using this coefficient, there is an expansion of Rs 138 billion in investment of the banking industry in Pakistan.

The bank level characteristics also affect the investment portfolio of the banks. Specifically, the investments increase as the size of the bank grows. Similarly, as the non-performing loans increases, the banks shift their asset portfolio to the investments. Likewise, the banks increase their investments with the liquidity injections through SBPs open market operations. On the other hand, the investment portfolio of the banks decreases with the issuance of more advances, as a substitute for investments.

The macroeconomic controls indicate that with the rise in inflation the investment to asset ratio of the banks increases. Conversely, government borrowing from the SBP decreases bank investments, as the government does not need financing from banking institutions in that case.

The results are presented in *Model 3*. The coefficient for the interaction term is significantly different from the main variable of interest. Specifically, the coefficient is 1.21 and suggests that after the IMF program in FY2020 the monetary tightening leads to an increase in investments to asset ratio of the banks. Thus, the government's options for financing the budget deficit affects the relationship between monetary policy and bank investments, particularly in government securities.

To check whether monetary policy impacts the investment portfolio of Islamic banking institutions differently, we included a dummy variable 'Islamic,' which is '1' if the banking institution is Islamic and '0' otherwise. We interacted it with the policy rate variable. The results in Table 3 suggest that the coefficient of the interaction term of Islamic dummy with the policy rate is not statistically different from that of the conventional banks. This indicates that the effect of monetary policy on the investment portfolios of Islamic banking institutions is not statistically distinct from its impact on the investments of conventional banks, both with and without controlling for other banking characteristics and macroeconomic variables (model 4 and model 5).

As a robustness check, instead of using the investment-to-asset ratio as the dependent variable, we also use growth in investment as the dependent variable. The results are similar regarding the relationship between the main variables. We also included LSM growth as a control variable for economic activity, but the coefficient for this variable is statistically insignificant.

6. Conclusion

This study investigates the potential relationship between the monetary policy and banks' investment behavior—particularly in government securities—using disaggregated quarterly data from individual banks in Pakistan over the period from June 2007 to June 2022, spanning 61 quarters. The study finds that an expansionary monetary policy improves the investment to asset ratio of the banks. The paper also finds that investment portfolio of the banks is also affected by bank-specific features. Specifically, the investments increases with the size of the bank and non-performing loans. Liquidity injections by the SBP through open market operations have a positive impact on the banks' investments. Conversely, the investment portfolio of the banks decreases with the issuance of more advances, which substitute the investments. There were constraints on the government borrowing from the SBP in the wake of EFF of the IMF availed by Pakistan in FY2020, increasing the government dependence on the banking sector to meet its budget deficit. We find that, in this scenario, the investments in government securities by the banks increases amid monetary tightening, suggesting a positive relationship between investment to asset ratio and policy rate change.

The macroeconomic variables also have an effect on the investment portfolio of the banks indicating that with the rise in inflation the investment to asset ratio of the banks increases. On the other hand, government borrowing from the SBP decreases bank investments, as the government does not need financing from banking institutions in this scenario.

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Table 1. Descriptive Statistics

	Mean	Media n	Max	Mi n	Std. Dev.	Obs .
Investment to Assets	35.45	35.29	91.80	5.00	16.49	2300
Advance to Assets	41.14	40.88	82.51	4.07	14.26	2300
Policy Rate (change)	0.09	0.00	4.00	-4.00	1.16	2300
M2 Growth	3.30	2.93	8.59	-0.61	2.83	2300
Cash to Assets	1.46	1.43	5.78	0.03	0.76	2300
NPLS Growth	0.05	0.00	6.10	-4.99	0.45	2300
Deposit Growth	4.82	3.33	179.60	-66.70	14.06	2300
OMO Change	0.07	0.00	1.86	-2.02	0.64	2300
LSM Growth	1.46	1.15	20.27	-20.47	11.47	2300

Table 2: Investment Portfolio, All Banks

The dependent variable is I_{it} which is the level of investment of bank i in quarter t normalized by the total assets of the bank. The independent variables are: lag dependent variable of bank i in quarter $t-j$, ΔPR_{t-j} is the quarterly change in the policy rate of the SBP in quarter $t-j$. The bank level characteristics and macroeconomic variables are also included as control variables.

(Sum of) Estimated Coefficients	Model 1		Model 2		Model 3	
	Value	Prob.	Value	Prob.	Value	Prob.
$\sum_{j=1}^m \alpha_j I_{it-j}$	0.85	0.00	0.78	0.00	0.63	0.00
$\sum_{j=0}^m \beta_j \Delta PR_{t-j}$	-0.83	0.00	-0.94	0.00	-1.00	0.00
$IMF * \sum_{j=0}^m \beta_j \Delta PR_{t-j}$					1.21	0.00
Size growth			0.19	0.00	0.20	0.00
Advances to total assets lagged			-0.14	0.00	-0.14	0.00
Cash to total assets lagged			-0.23	0.42	-0.24	0.41
NPLs Growth			0.49	0.07	0.42	0.11
Deposit Growth			-0.10	0.00	-0.10	0.00
Change in OMO			0.18	0.00	0.18	0.00
CPI Inflation			0.23	0.01	0.22	0.01
Government Borrowing from the SBP Growth lagged			-0.03	0.00	-0.03	0.00
Adjusted R-squared	0.88		0.89		0.90	
Durbin-Watson stat	1.96		2.04		1.86	
Bank Fixed Effects	Yes		Yes		Yes	

Table 3: Investment Portfolio, Convectional and Islamic Banking Institutions

The dependent variable is I_{it} which is the level of investment of bank i in quarter t normalized by the total assets of the bank. The independent variables are: lag dependent variable of bank i in quarter $t-j$, ΔPR_{t-j} is the quarterly change in the policy rate of the SBP in quarter $t-j$. The bank level characteristics and macroeconomic variables are also included as control variables.

(Sum of) Estimated Coefficients	Model 4		Model 5	
	Value	Probability	Value	Probability
$\sum_{j=1}^m \alpha_j I_{it-j}$	0.85	0.000	0.78	0.00
$\sum_{j=0}^m \beta_j \Delta PR_{t-j}$	-0.67	0.02	-0.80	0.00
<i>Islamic</i> * $\sum_{j=0}^m \beta_j \Delta PR_{t-j}$	-0.36	0.37	-0.39	0.33
Size growth			0.19	0.00
Advances to total assets lagged			-0.14	0.00
Cash to total assets lagged			-0.23	0.42
NPLs Growth			0.49	0.07
Deposit Growth			-0.10	0.00
Change in OMO			0.18	0.00
CPI Inflation			0.23	0.01
Government Borrowing from the SBP Growth lagged			-0.03	0.00
Adjusted R-squared	0.88		0.90	
Durbin-Watson stat	1.96		2.04	
Bank Fixed Effects	Yes		Yes	