Effects of Monetary Policy on Stability and Asset Quality of the Banks in Pakistan

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Sajjad Zaheer and Muhammad Farooq Arby*

Abstract

This study analyzes the impact of monetary policy on financial stability and asset quality of the banks in Pakistan using quarterly data of individual banks from June 2007 to June 2022 after controlling for heterogeneous bank specific characteristics and macroeconomic conditions. Moreover, the paper investigates the differences in banks' responses to monetary policy stance across bank types, i.e., conventional versus Islamic. The results show that a policy rate hike affects the stability of the conventional banking institutions negatively; however, in sharp contrast, stability of the Islamic banks is positively associated with policy rate hike. Z-score is used as stability indicator, which is based on ratios of capital to assets and return on assets. A one percentage point hike in monetary tightening reduces the Z-score by 0.10 points in case of conventional banks; and increases it by 0.10 points in case of Islamic banks. Regarding the asset quality, the non-performing loans of both the conventional and Islamic banks increase by 0.19 points with a one percentage point increase in the monetary tightening.

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Non-technical Summary

State Bank of Pakistan conducts monetary policy in order to achieve its primary objective of price stability. However, monetary policy also has bearings on the overall financial system, stability of which is also one of the key objectives of the SBP. Therefore, it is important to investigate the impact of monetary policy on financial stability and performance of key players of the financial system, i.e., commercial banks.

The stance of monetary policy, as reflected through interest rates, affects financial stability and asset quality of banks through various ways. For example, when interest rates are low the banks may have a higher risk-taking appetite; and they tend to grant more loans to risky firms with fewer collateral requirements. Such a lending may compromise the quality of their assets.

On the contrary, easy monetary policy may improve the repayment capacity of the borrowers; and may result in improved financial stability and lower non-performing loans. In other words, banks' asset quality improves ex-post if there is a decrease in interest rates. Lower interest rates make credit repayment easier by decreasing the interest burden of the borrowers that, in turn, lowers loan default rates.

As the literature provides divergent views about the impact of monetary policy on banking system, we explore this phenomenon in the case of Pakistan empirically where conventional and Islamic banking institutions coexist. In this study, we examine the impact of monetary policy on financial stability and asset quality of the banks in Pakistan using quarterly data of individual banks since June 2007. Moreover, the paper investigates the differences in banks' responses to monetary policy shocks across bank types, i.e., conventional versus Islamic banks by employing data with heterogeneous bank specific characteristics.

The results show that a monetary tightening affects the stability of the conventional banking institutions adversely. However, there is positive impact of a policy rate change on the financial stability of Islamic banks. Regarding the capital to asset ratio (CAR), the results indicate that a monetary policy tightening impacts CAR of the conventional banks negatively, whereas CAR of the Islamic banks is associated positively with a policy rate change. Moreover, the policy rate hike has an adverse impact on the return on assets as well as non- performing loans of the banks, i.e. loans are more difficult to repay if rates are higher. These results are obtained after controlling for the impact of banks specific variables such ratio of fixed assets, cost inefficiency, and size as well as macro variables such as growth in money supply (M2).

Effects of Monetary Policy on Stability and Asset Quality of the Banks in Pakistan

1. Introduction

Ensuring stability of the financial system is one of the key objectives of the State Bank of Pakistan (SBP). While SBP conducts monetary policy in pursuit of its primary objective of price stability, it is important to explore the implications of monetary policy measures on its other key objective, i.e., financial stability and performance of the banking system. In the literature, it is well established that monetary policy stance has implications for banks' appetite for risk taking and their asset quality (Rajan, 2006; Delis and Kouretas, 2011; Maddaloni and Peydro, 2011; Borio and Zhu, 2012). Specifically, when interest rates are low the banks may have a higher risk-taking appetite. A lower interest rate scenario induces banks to grant more loans to risky firms and to commit larger loan volumes with fewer collateral requirements to these firms, yet with a higher likelihood of non-performing loans.

On the other hand, there are also some studies that show that an easy monetary policy may result in lower non-performing loans and financial distress. Specifically, the changes in interest rate can affect banks' stability through adjustments in banks' asset quality while influencing the repayment capacity of the borrowers (Jarrow and Turnbull, 2000; Carling et al., 2007; Alessandri and Drehmann, 2010; Özsuca and Akbostanci, 2016). To put it differently, banks' asset quality improves ex-post if there is a decrease in interest rates (Jimenez et al., 2014; Altunbaş et al., 2014). Lower interest rates make credit repayment easier by decreasing the interest burden of the borrowers that, in turn, lowers loan default rates (Bernanke & Gertler, 1995). On the other hand, loans are more difficult to repay if rates are higher thereby increasing the credit risk (Abedifar et al, 2013). Also, the positive influence of the policy rate hike on interest income may exceed the negative one on loan loss provisions (Borio et al., 2017). Besides, the banks may generate spread by obtaining funds at low interest rate and investing them in high yielding assets, subject to the stable returns in these assets (Lambert and Ueda, 2014).

Nonetheless, this literature pertains to the conventional banking structure, which may have varying nature and degree of impact in the case of dual banking system with conventional and Islamic segments. There are also some studies which analyze the impact of monetary policy on conventional and Islamic banks. Khatat (2016), in a working paper of IMF, suggests that the

central banks should consider a dual approach to monetary policy wherever the Islamic financial system is not as developed as the conventional one. In an empirical study using data from Pakistan, Zaheer et al. (2013) provide evidence that after a monetary contraction Islamic banks maintain their lending irrespective of their liquidity positions, in contrast to their counterparts in conventional banking institutions that cut their lending. Abedifar et al. (2013) find that small Islamic banks appear to be more stable than conventional banks.[1] Some other studies also compare the stability and asset quality of the conventional and Islamic banks. Using data from Pakistan, Farooq and Zaheer (2015) compare the behavior of Islamic and conventional banks during a financial panic and find that Islamic bank branches are less prone to deposit withdrawals during financial panics, which suggests a role for religious branding. They also find that Islamic bank branches grant more loans during financial panics and that their lending decisions are less sensitive to changes in deposits suggesting that greater financial inclusion of faith-based groups may enhance the stability of the banking system. Baele et al (2014) compare the default rates in Islamic and conventional loans by employing credit register monthly data of over 150 thousand loans from Pakistan and find that the default rate of Islamic loans is lower than half the default rate of conventional loans. Beck et al. (2013), find the evidence that Islamic banks have higher asset quality and are better capitalized, but are not significantly different with respect to Z-score.[2] In another cross-country study, Čihák and Hesse (2010) find that small Islamic banks are more stable than small and large conventional commercial banks; however, large conventional banks are more stable than large Islamic banks.[3]

As the literature provides divergent views about the impact of monetary policy on banking system, we explore this phenomenon in the case of Pakistan empirically where conventional and Islamic banking coexist. In this study, we examine the impact of monetary policy on financial stability and asset quality of the banks in Pakistan using quarterly data of individual banks since June 2007. Moreover, the paper investigates the differences in banks' responses to monetary policy shocks across bank types, i.e., conventional versus Islamic banks by employing data with heterogeneous bank specific characteristics.

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[1] They use the data of 553 banks across 24 countries
[2] They employ the data of 68,818 banks across 22 countries.
[3] The authors use the data 77 Islamic banks and 397 conventional banks across 20 countries.

The next section of the paper describes data used in the study and section 3 presents model specification. The section 4 discusses results and the last section concludes the paper.

2. Data and Descriptive Statistics

The study uses quarterly financial accounts of individual commercial banks submitted to the SBP at the end of each quarter since June 2007. The data contains very detailed information of all the balance sheet and income statement items of all commercial banks. We employ the indicators for stability and asset quality to evaluate the response of conventional and Islamic banks. The data covers 61 quarters starting from June 2007 to June 2022.

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). The 17 conventional banks have both Islamic as well as conventional operations, whereas the 10 banks are exclusive conventional banks (CBs). Total assets of the banking industry reached Rs 34.9 trillion at the end of June 2022 which 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 that reached Rs. 23.7 trillion which are 68 percent of the total liabilities, followed by borrowing from the financial intuitions. Around 48 percent of the banking assets are held by the 5 big banks.

Following the convention in Pakistan, we name the Islamic branches of mixed banks as Islamic banking branches (IBBs) and their conventional branches as conventional banking branches (CBBs). Both IBBs and IBs form the Islamic banking institutions (IBIs) and CBs and CBBs constitute conventional banking institutions (CBIs).

Table 1 shows descriptive statistics of main indicators for the banking industry and macroeconomic variables in Pakistan. We use Z-score to gauge the stability of the banking institutions. The Z-score is the sum of Capital to Asset Ratio (CAR) and Return on Assets (ROA), normalized by the standard deviation of ROA over the sample period as followed by Beck and Laeven (2006).

Mathematically, it can be shown as $\text{Z-score} = \frac{CAR + ROA}{SD(ROA)}$.

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[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)

With a combination of accounting measures of profitability, leverage and volatility, it indicates the distance from insolvency (Beck, Demirgüç-Kunt and Merrouche, 2013).

Table 1. Descriptive Statistics

	Mean	Median	Max	Min	Std. Dev.	Obs.
Z-Score	6.94	6.00	67.00	-16.00	6.24	2700
Capital Assets Ratio	11.70	8.28	98.55	-61.28	12.65	2700
Return on Assets	0.62	0.95	17.24	-27.33	2.79	2700
Non-Performing Loans to Gross Loans	10.56	6.70	85.02	0.00	13.90	2700
Policy Rate (change)	0.09	0.00	4.00	-4.00	1.13	2700
Fixed Assets to Total Assets	0.03	0.02	0.33	0.00	0.05	2700
Cost to Income	0.97	0.85	5.69	0.07	4.68	2700
Size	18.32	18.48	22.34	11.14	1.78	2700
M2 Growth	3.28	2.93	8.59	-0.61	2.83	2700
Inflation	2.32	2.02	8.64	-1.00	1.94	2700
LSM Growth	0.01	0.01	0.20	-0.20	0.11	2700

The index relates a bank's buffers of capitalization and returns with the volatility of those returns. The Z-score has been increasingly used to check a bank's stability and the index is negatively related to the insolvency of a bank. That is, the bank with higher Z-score is considered more stable. Bank insolvency is defined as a state where (CAR + ROA) < 0, or equally when losses exceed the bank capital (Boyd and Runkle, 1993). Thus, the Z-score demonstrates the number of standard deviation that a bank's return has to fall below its expected value before capital is eroded and the bank becomes insolvent (Abedifar et al., 2013). A greater Z-score relates to a lower upper bound of insolvency risk and, therefore, implies a lower likelihood of insolvency risk (Maechler and Worrell, 2005). The data shows that the industry average of Z-score stands at 6.94 for the whole period from June 2007 to June 2022.[5]

We also explored the impact of monetary policy on individual components of Z-score, i.e, CAR and ROA. The industry average of CAR is 11.70 percent.

For estimating the impact of monetary policy on asset quality of banks, we use the non-performing loans to gross loans ratio (NPLs) as an indicator of asset quality, which shows the infection ratio of the loan portfolio of a bank. The industry average of this ratio for the period under review is 10.56 percent. The monetary policy stance is gauged through the policy rate changes. The mean of change in the policy rate, in a year:quarter, remained 9 basis points with maximum of 400 bps and minimum of -400 bps, during the period under review.

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[5] According to the databank of the World Bank, the Z-score, calculated from underlying bank-wise unconsolidated data from Bankscope and Orbis, for Pakistan's banking industry in 2021 remains at 8.85. Among 137 countries, where the Z-score ranges from 51.67 (most stable, Luxembourg) to 1.28 (Iceland), Pakistan's standing is at 108th number.

3. Model Specification

To estimate the impact of monetary policy on the financial stability and asset quality of the banking sector we broadly follow Abedifar et al., (2013) and employ equation (1).

$$S_{it} = \alpha_i + \beta_1\, dPR_{it} + \beta_2 IBI_i * dPR_{it} + \gamma_1 B_{it} + \gamma_1 M_t + \varepsilon_{it} \qquad (1)$$

where S_{it} is one of the measures corresponding to stability and asset quality of bank i, in year:quarter *t*. α_i is coefficient for bank fixed effects, whereas IBI_i is the dummy for Islamic banking intuitions that comprises full-fledged Islamic banks and Islamic banking branches of mixed banks. The dummy is equal to 1 when the banking operations are Islamic and zero otherwise. dPR_t is the change in the policy rate decided by the Monetary Policy Committee (MPC) of the SBP since 2015. Changes in discount rate has been used for earlier period. B_{it} are the banking characteristics to control the results for an array of bank/ segment-level time-changing features which might affect the differences in response to the monetary policy impulse across banks. Specifically, we include log of assets, fixed assets and cost-income ratio of the banks to control for size, asset structure and cost efficiency of banks, respectively. There is no definite relationship between bank size and stability (Beck et al., 2013).

However, inclusion of fixed assets to total assets ratio to control for the opportunity cost of having unproductive assets and cost efficiency,[6] influence the stability of the banks as shown by some previous studies (Aggarwal and Yousef (2000); Beck et al., (2013); Demirgüç-Kunt and Huizinga (2010)). M_t are the macroeconomic variables to control for macroeconomic conditions affecting financial stability and asset quality. Specifically, we include growth in money supply, large scale manufacturing and inflation.

Further, to see the corresponding difference from conventional banking, we also split the dummy for IBIs into dummy for Islamic banks and Islamic banking branches of the convntional banks, and estimate the following equation:

$$(2) \qquad S_{it} = \alpha_i + \beta_1\, dPR_{it} + \beta_2 IB_i * dPR_{it} + \beta_3 IBB_i * dPR_{it} + \gamma_1 B_{it} + \gamma_1 M_t + \varepsilon_{it}$$

where IB and IBB are dummies for full-fledged Islamic banks and Islamic banking branches of mixed banks respectively.

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[6] Fixed assets include operating fixed assets of the bank.

4. Results:

Table 2 reports the results of the impact of monetary policy on financial stability of the banking sector while controlling for the size, asset and cost structure of the banking institutions and macroeconomic variables. Initially, the specification has been estimated for the overall banking sector. Subsequently, to check whether or not there is a difference in responses of IBIs and CBIs to a monetary policy stance, we use dummies for Islamic banks and Islamic banking branches and interact these with the change in policy rate. Standard errors are robust to autocorrelation and are clustered at the bank level (we also check estimates when standard errors are heteroskedasticity-consistent and clustered at the year:quarter, but the significance levels are mostly unaffected).

The results of *Model 1* show that the coefficient of policy rate change is negative but statistically insignificant for stability of the whole banking industry. However, when we introduce dummies for type of banking institutions, i.e., conventional and Islamic, the results change. As shown by *Model 2* of **Table 2,** the monetary policy stance measured by the change in policy rate affects the stability of conventional banks adversely but has favorable impact for Islamic banking institutions. More specifically, the stability indicator, Z-score, decreases by 0.11 points in response to monetary tightening by one percentage point in a quarter in case of conventional banks. We can interpret this result as higher interest rates make loan repayment more difficult for borrowers, which would result in stress on capitalization in the wake of higher loan default rates. This, in turn, would make the financial sector less stable.

In case of Islamic banking institutions, there is positive impact of 0.09 points of a policy rate change on the financial soundness of Islamic Banking Intuitions. This is probably due to better capitalization of IBIs subsequent to a policy rate hike. Also, there is no minimum deposit rate requirement for Islamic banking that is mandatory to be paid to their saving deposit holders. Conversely, conventional banking institutions are liable to pay minimum deposit rate, equivalent to 50 bps lower than the floor rate, to their customers who maintain saving accounts with the bank. This may explain the difference in response of conventional banks and Islamic banks to policy rate changes.

In *Model 3*, we further split the IBIs into exclusive Islamic banks and IBBs of the conventional banks. The results suggest that both IBs and IBBs of conventional banks respond significantly

differently from conventional banking institutions to a monetary policy shock. The impact of a monetary policy shock to the stability of IBs and IBBs is positive.

Robustness

We also control for economic activity through including macroeconomic variables such as growth in money supply, growth in large scale manufacturing and inflation and the results remain almost the same (*Model 5, 6 and 7*). We also check the robustness of the model using subsample of the banks with dual operations, both conventional and Islamic, and the results remain broadly robust to this treatment.

To disentangle the impact of the monetary policy on the banking stability in Covid-19 pandemic, we introduce a dummy variable for that period from 2020 onward and interact this dummy with the policy rate change. The results show that the impact a monetary shock on the financial stability of the banking sector during Covid is not significantly different from that in the period before Covid (*Model 4*).

Models with CAR

Table 3 presents the results related to the impact of monetary policy impulses on CAR of the banks. *Model 9*, shows that tightening a monetary policy impacts the CAR of the overall banking negatively, mainly through conventional banking. Specifically, *Model 13* shows that the CAR of the conventional banks decreases in response to a policy rate change. On the other hand, the coefficient for the interaction terms for Islamic banks and Islamic banking branches with the policy rate change is significantly different from that of conventional banking intuitions. In fact, the CAR of the Islamic banking branches of the conventional banks are associated positively with the policy rate hike. Further, the impact of monetary policy on CAR of both conventional and Islamic banking is not significantly that in the period before Covid (*Model 11*).

Models with ROA

Table 4 reports the result of the relationship of monetary policy and ROA of the banks. We find that a monetary shock has a negative impact on the return on assets of the banks. The response of Islamic banking is not different from the conventional banks (*Model 19*).

Models with Asset Quality

In Table 5, we check the relationship of monetary policy and NPLs of the banks. We find that the monetary policy shock has an adverse impact on the NPLs of the banks, i.e. loans are more difficult to repay if rates are higher. The response of Islamic banking is not different from the conventional banks in terms their response to monetary policy (*Model 26 and 27*). The findings are consistent with the previous studies that higher interest rates increase the credit risk of outstanding loans (Altunbas et al., 2014; and Jiménez et al., 2009). The impact of monetary policy on NPLs of the banks in covid is not different from that in before covid (*Model 22*).

5. Conclusion

This study analyzes the impact of monetary policy on financial stability and asset quality of the banks in Pakistan, using quarterly data of all individual banks since June 2007. Moreover, the paper investigates the differences in banks' responses to monetary policy shocks across bank types, conventional versus Islamic, using data of the whole panel of banking industry with heterogeneous bank specific characteristics and macroeconomic variables.

The results demonstrate that tightening of the monetary policy has an adverse impact on the stability of the conventional banking. However, there is positive impact of a policy rate change on the financial stability of Islamic banks. Further, tightening a monetary policy impacts the CAR of the overall banking negatively, mainly through conventional banks as their CAR is negatively associate with the policy rate hike. On the other hand, CAR of the Islamic banks is positively associated with a policy rate change. Moreover, the policy rate hike has an adverse impact on the return on assets as well as non- performing loans of the whole banking industry, i.e., loans are more difficult to repay if rates are higher. These results are obtained after controlling for the impact of banks specific variables such ratio of fixed assets, cost inefficiency, and size as well as macro variables such as growth in the money supply.

Table 2: The table reports the estimated coefficients of different variables to stability index, Z-score, as dependent variable of bank i in year: quarter using policy rate as main variable of interest with other bank level controls and macroeconomic variables. The independent variable Islamic Banking Intuitions is a dummy variable which takes the value of 1 if the institution is either an exclusive Islamic bank or Islamic banking branches of a conventional banks and zero otherwise. *Islamic banks* dummy variable takes the value of 1 if the institution is an Islamic bank and zero otherwise. Islamic banking branches dummy is one if the banking entity is the Islamic branches of a conventional bank and zero otherwise. Size is log of the assets. Fixed assets are normalized by the total assets of each banking intuition. The estimations use various numbers of banking institution– year: quarter observations. *** denotes significance at 1 percent, ** significance at 5 percent, and * significance at 10 percent.

Dependent Variable	Z-Score							
Explanatory Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Lag Dependent	0.77***	0.77***	0.77***	0.77***	0.77***	0.77***	0.78***	0.71***
Change in Policy Rate	-0.03	-0.11***	-0.11***	-0.10*	-0.13***	-0.10***	-0.10***	-0.12***
Change in Policy Rate*Covid				-0.03				
Islamic Banking Institutions* Change in Policy Rate		0.20***		0.27***		0.20***		
Islamic Banks* Change in Policy Rate			0.15**		0.15**		0.15**	
Islamic Banking Branches* Change in Policy Rate			0.21***		0.21***		0.22***	0.22***
Fixed Assets/Total Assets	-0.58	-0.56	-0.61	-0.83				
Cost to Income	-0.13**	-0.13**	-0.13**	-0.13**	-0.13**	0.13**	0.13**	0.12**
Size	-0.38***	-0.38***	-0.38***	-0.40***	-0.37***	-0.38***	-0.38***	-0.38***
Change in Size	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.05***
Growth in M2					0.05*	0.06**	0.06**	0.08**
Inflation					0.03			
Growth in LSM					-0.07			
Constant	8.95***	9.03***	9.04***	9.31***	8.70***	8.94***	8.94***	9.05***
Adj. R-squared	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.88
Observations	2677	2677	2677	2677	2677	2677	2677	1876
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3: The table reports the estimated coefficients of different variables to Capital Asset Ratio, as dependent variable of bank i in year: quarter using policy rate as main variable of interest with other bank level controls and macroeconomic variables. The independent variable Islamic banks is a dummy variable which takes the value of 1 if the institution is an Islamic bank and zero otherwise. Islamic banking branches dummy is one if the bank is the Islamic branches of a conventional bank and zero otherwise. Size is log of the assets. Fixed assets are normalized by the total assets of each banking intuition. The estimations use various numbers of banking institution– year: quarter observations. Standard errors (in parentheses) are clustered at the bank (segment) level. *** denotes significance at 1 percent, ** significance at 5 percent, and * significance at 10 percent.

Dependent Variable	Capital Asset Ratio				
Explanatory Variables	**Model 9**	**Model 10**	**Model 11**	**Model 12**	**Model 13**
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Lag Dependent	0.88***	0.88***	0.88***	0.87***	0.87***
Change in Policy Rate	-0.07***	-0.17***	-0.15*	-0.18***	-0.15**
Change in Policy Rate*Covid			-0.07		
Islamic Banking Institutions*Change in Policy Rate			0.25*		
Islamic Banking Institutions*Change in Policy Rate*Covid	0.26***	0.03			
Islamic Banks*Change in Policy Rate			0.36***	0.25***	0.25***
Islamic Banks*Change in Policy Rate*Covid			-0.16		
Islamic Banking Branches*Change in Policy Rate		0.29***		0.31***	0.31***
Fixed Assets/Total Assets	0.25	0.25	-0.04		
Cost to Income	-0.35***	-0.34***	-0.34***	-0.21***	-0.21***
Size	-0.24*	-0.25*	-0.26**	-0.29***	-0.30**
Change in Size	-0.14***	-0.14***	-0.14***	-0.14***	-0.14***
Growth in M2				0.06***	0.06***
Inflation				0.04	
Growth in LSM				0.001	
Constant	6.83**	6.71**	6.98***	7.01***	7.32***
Adj. R-squared	0.95	0.95	0.95	0.95	0.95
Observations	2677	2677	2677	2677	2677
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes

Table 4: The table reports the estimated coefficients of different variables to Return on Assets, as dependent variable of bank i in year: quarter using policy rate as main variable of interest with other bank level controls and macroeconomic variables. The independent variable Islamic Banking Intuitions is a dummy variable which takes the value of 1 if the institution is either an exclusive Islamic bank or Islamic banking branches of a conventional banks and zero otherwise. *Islamic banks* dummy variable takes the value of 1 if the institution is an Islamic bank and zero otherwise. Islamic banking branches dummy is one if the banking entity is the Islamic branches of a conventional bank and zero otherwise. Size is log of the assets. Fixed assets are normalized by the total assets of each banking intuition. The estimations use various numbers of banking institution– year: quarter observations. *** denotes significance at 1 percent, ** significance at 5 percent, and * significance at 10 percent.

Dependent Variable	Return on Assets					
Explanatory Variables	Model 14	Model 15	Model 16	Model 17	Model 18	Model 19
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Lag Dependent	0.34***	0.34***	0.34***	0.34***	0.34***	0.34***
Change in Policy Rate	-0.07**	-0.07**	-0.05*	-0.05*	-0.05*	-0.05*
Change in Policy Rate*Covid		-0.08				
Islamic Banking Institutions*Change in Policy Rate			-0.06			
Islamic Banks*Change in Policy Rate				-0.01	-0.01	-0.01
Islamic Banking Branches*Change in Policy Rate				-0.08	-0.08	-0.08
Cost to Income	-3.94***	-3.94***	-3.95***	-3.95***	-3.92***	-3.95***
Provisioning/Loans	-0.32***	-0.32***	-0.32***	-0.32***	-0.32***	-0.32***
Size	-0.16**	-0.17**	-0.16*	-0.16*	-0.17*	-0.16*
Fixed Assets/Total Assets					-1.95	
Growth in M2	0.01*	0.01	0.01*	0.01*	0.01*	0.01*
Inflation	0.05***	0.05***	0.05***	0.05***	0.06***	0.05***
Growth in LSM				0.001		
Constant	6.86***	7.04***	6.84***	6.84***	6.84***	6.84***
Adj. R-squared	0.84	0.84	0.84	0.84	0.84	0.84
Observations	2603	2603				
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Seasonal Dummies	No	No	No	No	No	No

Table 5: The table reports the estimated coefficients of different variables to stability index non-performing loans to gross loans ratio, as dependent variable of bank i in year: quarter using policy rate as main variable of interest with other bank level controls and macroeconomic variables. The independent variable Islamic Banking Intuitions is a dummy variable which takes the value of 1 if the institution is either an exclusive Islamic bank or Islamic banking branches of a conventional banks and zero otherwise. *Islamic banks* dummy variable takes the value of 1 if the institution is an Islamic bank and zero otherwise. Islamic banking branches dummy is one if the banking entity is the Islamic branches of a conventional bank and zero otherwise. Size is log of the assets. Fixed assets are normalized by the total assets of each banking intuition. The estimations use various numbers of banking institution– year: quarter observations. *** denotes significance at 1 percent, ** significance at 5 percent, and * significance at 10 percent.

Dependent Variable	Non-Performing Loans							
Explanatory Variables	Model 20	Model 21	Model 22	Model 23	Model 24	Model 25	Model 26	Model 27
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	
Lag Dependent	0.95***	0.96***	0.96***	0.95***	0.96***	0.95***	0.94***	0.95***
Change in Policy Rate	0.24***	0.24***	0.29***	0.18***	0.29***	0.18*	0.19**	0.19**
Change in Policy Rate*Covid			-0.16					
Islamic Banking Institutions*Change in Policy Rate				0.14	0.12		0.13	
Islamic Banks*Change in Policy Rate						0.11		0.11
Islamic Banking Branches*Change in Policy Rate						0.15		0.13
Change in markup income	-0.01***	-0.02***	-0.02***	-0.01***	-0.01***	-0.01***	-0.02***	-0.02***
Size	-0.21**	-0.16**	-0.16**	-0.21**	-0.16	-0.21**	-0.18*	-0.18*
Change in Size	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***
Growth in M2	0.58***	0.53***	0.53***	0.58***	0.65***	0.58***	0.51***	0.51***
Inflation	0.44***	0.41***	0.41***	0.44***	0.40***	0.44***	0.42***	0.42***
Growth in LSM		-0.05***	-0.05***				-0.05***	-0.05***
Constant	2.64	2.08	2.33	2.72	1.92	2.73	2.44	2.44
Adj. R-squared	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Observations	2566	2566	2566	2566	2566	2566	2579	2579
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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