An Empirical Investigation of the Credit Channel of Monetary Policy: Islamic *versus* Conventional Banks of Pakistan

Abdul Rashid[1]   Muhammad Abdul Rehman Shah[2]   Muhammad Tahir Mansoori[3]

Abstract

This paper investigates the influence of Monetary Policy (MP) on the credit supply decisions of Islamic Banks (IBs) and Conventional Banks (CBs) of Pakistan. The empirical analysis covers the period 2005-2017. The robust two-step system-GMM results provide strong evidence that MP measures are significantly and negatively related to the credit supply in the economy, confirming the existence of the "bank credit channel" of MP in the economy. Yet, the results show that the impacts of MP on financing decisions are weak for IBs than for CBs. Our results suggest that for effective implementation of the MP, the monetary authorities should take into account the relatively slow response of IBs to MP actions.

JEL Classifications: G15; G21; E52; E42,

Keywords: Credit channel, Transmission mechanism, Lending channel, Islamic and conventional banks, Monetary policy

Introduction

Monetary policy works through different transmission channels to affect real and nominal activities in an economy. These channels behave differently in different economies, depending on the structure and efficiency of the economy. The most prominent among these channels are "the exchange rate channel", "the interest rate channel", "the asset price channel", and "the bank credit channel – hereafter BCC". The BCC, which is also known as the "bank-centric view", is based on the two other channels viz. the "bank lending channel" and the "balance sheet channel". Several economists such as Bernanke and Blinder (1988, 1995), Bernanke, Gertler, and Gilchrist (1995), and Mishkin (2008) have questioned the effectiveness of the conventional "interest rate channel" in the transformation of the MP effects on the economy. Researchers have incorporated information asymmetry in financial markets to explain the role of banks in MP transmission. A "bank credit channel" of MP principally works through two other sub-channels: "the lending channel" and "the balance sheet channel". For instance, Bernanke, Gertler, and Gilchrist (1995) have investigated a BCC of MP with a particular concentration on the "bank lending channel" and the "balance sheet channel". They documented significant evidence indicating the presence of the "credit channel" of MP.

---

[1] International Islamic University, Islamabad, Email: abdulrashid@iiu.edu.pk

[2] PhD Scholar, International Islamic University, Islamabad, Email: a.rehman@uettaxila.edu.pk

[3] International Islamic University, Islamabad.

In a "bank-centric view", it is presumed that money, bonds, and bank loans are the three important types of monetary assets. In this perspective, the response of banks' credit supply decisions to MP actions is viewed as banks' lending response. The "bank lending channel" is centered on the notion that MP actions may impact the availability of lendable funds by affecting banks' liabilities and thus, the total amount of credit banks can supply. However, "the balance sheet channel" is originated from the idea that both the Balance Sheets and Income Statements of lending institutions are adversely affected by increases in interest rates, which, subsequently, affects the ability of banks to issue credit to consumers and business firms. Finally, the "credit channel" mechanism of MP refers to the theory that MP actions significantly influence the total supply of loans that banks issue to the economy for purchases of capital and consumer goods, and consequently, affect the real and nominal activities of an economy.

The BCC of the MP Transmission Mechanism (MPTM) has attained great attention by both researchers and policymakers, particularly, after the worldwide financial crisis of 2007-08 that significantly adversely affected the banking sector's stability and profitability. Prior empirical studies have provided strong evidence of the existence of BCC in several developed countries based on CBs' data. Examples of these studies are Bernanke and Blinder (1988, 1995), Bernanke, Gertler, and Gilchrist (1995), Cecchetti (1995), Janjua, Rashid, and Qurrat-ul-Ain (2014), and Kashyap and Stein (1994).

Islamic banking nowadays is growing across the globe and has shown its resilience during the crisis. Nevertheless, on the empirical grounds, we know less about the relative role of IBs in MPTM. Compared to CBs, IBs are quite different with respect to their asset and liability structures. The financial sector is linked to the real economy is one of the fundamental features of Islamic banking (Nosheen & Rashid, 2019; Shah, Rashid, & Zaman, 2017). These differences are mainly because of the distinguished features of the underlying conceptual models of Islamic *versus* conventional financial institutions. Indeed, considering these differences in characteristics, several scholars such as Akhatova, Zainal, and Ibrahim (2016), Hamza and Saddaoui (2018), Hardianto (2004), Husin (2013), Kaleem and Isa (2006), Rafay and Farid (2019), Sukmana and Kassim (2010), and Zaheer, Ongena, and Wijnbergen (2013), have investigated the influence of MP actions on the financing decisions of IBs by utilizing aggregated data. They found that increased interest rates have significant and negative impacts on the total amount of financing supplied by IBs. Yet, it is important to note that these scholars did not utilize individual bank-level data while analyzing the MP effects on banks' lending decisions.

In this paper, we argue that if both IBs and CBs are part of the financial system, then MP actions may transmit to real economic activities by affecting the operations of

both types of banks. We also argue that since Islamic banks' business models are quite different than that of their conventional counterparts and since Islamic banks' financing activities are equity-based, it is very likely that the effects of MP actions would be less on IBs than that on conventional ones. Nonetheless, we suppose that MP actions will significantly affect both types of banks' financing activities. We predict this because both types of banks share common markets and work under the same regularity umbrella, albeit IB is non-interest-based banking. On the contrary, conventional banking in interest-based and the assets of conventional banks are mainly structured in terms of debt instruments.

Given the above-mentioned differences, it would be worth exploring whether IBs hinder or intensify the influences of MP actions on the real economy. Yet, until now we know less about the relative role of Islamic banking in MPTM. Therefore, this paper aims at exploring the existence of the "credit channel" of MP transmission in Pakistan using individual bank-level data on banks' credit supply. The paper also aims to investigate the role of IBs in the MPTM. To do so, the paper utilizes an unbalanced annual panel dataset of a sample of 27 individual banks of Pakistan.[4] The "robust two-step system – GMM estimator" is applied to mitigate the potential endogeneity problem and take into consideration the dynamics of banks' credit supply decisions. The empirical analysis covers the period 2005-2016. The paper significantly expands to the current literature on the MPTM by providing strong evidence of the existence of the "credit channel" of MP in Pakistan and by showing that although the "credit channel" exists in the case of IBs, IBs' credit issuance is relatively less adversely affected by increased policy rates. The results of the paper suggest that although both IBs and CBs cut the amount of financing they supply during episodes of tight monetary policy, IBs reduce their financing by fewer amounts than the conventional ones. The findings on the presence of a "bank credit channel", in both Islamic and conventional banks, have several important implications for the monetary authorities of Pakistan and countries having a dual banking system.

The paper is organized as follows. Section 1 presents the introduction and objectives of the paper. Section 2 represents a review of the relevant literature. Section 3 describes the analytical framework. The empirical findings are discussed in Section 4. Finally, Section 5 summarizes the key findings and presents policy implications.

Review of Empirical Literature

Monetary policy transmission is the mechanism through which monetary policy transmits the decisions into changes in the real GDP, the rate of inflation, and other macroeconomic indicators (Taylor, 1995). Similarly, Carvalho and Nechio (2014) defined that the transmission mechanism of MP explains how policy-induced variations

---

[4] Including both full-fledged IBs and Islamic divisions of CBs.

in the nominal money stock or the short-term nominal interest rate affect the real indicators; aggregate output and employment level. In economic theory, MPTM is commonly known as the "black box" (Bernanke & Blinder, 1995). The three main factors that affect monetary transmission considerably are discussed as follows: (1) the behavior adjustment of a central bank, the banking industry and other economic players in economic and financial activities; (2) the time lag of the monetary policy indicators since the implementation of MPTM until the achievement of the final target of the policy; and (3) changes in the monetary transmission channel along with the economic development of the nation (Tenreyro & Gregory, 2016). Mishra, Montiel, and Spilimbergo (2012) have mentioned four main channels of monetary transmission: the interest rate channel, the asset-pricing channel, the exchange rate channel, and the bank-lending channel.

The "bank lending channel" works through the response of the credit supply to MP actions. Therefore, the credit channel can also be said to be an enhanced mechanism of the "interest rate channel". Bernanke and Blinder (1988) were the first to lay down the foundation for the roles of banks in the MPTM. Bernanke and Blinder (1995), Kashyap and Stein (2000), and Kishan and Opiela (2000) have confirmed the presence of the "lending channel" in the USA. Most of the studies deal with the responses of the credit supplies of the banks from distinct characteristics such as bank size, liquidity, and capital. Kashyap and Stein (1995) have documented that small-sized banks reduce their lending more than large-sized banks in periods of MP tightening. Similarly, Cecchetti (1999), Ehrmann and Smets (2003), Kashyap and Stein (1997), and Santis and Surico (2013) have explored some descriptive evidence on the credit channel for the EU countries. Following these studies, Anwar and Nguyend (2018), Auclert (2017), Aysun and Hepp (2013), Bernanke, Lown, and Friedman (1991), Erdogdu (2017), Evans, Fisher, Gourio, and Kran (2015), Jermann (2019), Kashyap and Stein (1995), and Wong (2000) have documented the "credit view" of MPTM.

In the context of Pakistan, Janjua, Rashid, and Qurrat-ul-Ain (2014) also empirically examined the presence of the "bank-centric view" of the credit supply, using an individual bank-level annual dataset for the period 2006-2012. They confirmed the presence of the "bank credit channel" in Pakistan. They also found that small-sized banks are likely to be more influenced than large-sized banks during periods of higher interest rates. This finding may be attributed to the fact that larger banks are more likely to absorb the MP shocks as they may have more internally generated available funds for issuing loans. However, one should note that they do not explore the relative role of IBs *versus* CBs in the MPTM in Pakistan, which is the core theme of this study.

Islamic banking is emerging across the globe and the industry holds a substantial share of credit supply in countries like Pakistan, Malaysia, Indonesia, Sudan, Kuwait,

Turkey, Egypt, and others, which have a dual banking system. As a part of the financial market, IBs are playing an essential role in transmitting MP actions. Zaheer, Ongena, and Wijnbergen (2013) have examined the response of Islamic financing to the monetary policy and found that Islamic financing continued to grow even in periods of tight MP. Their findings hold regardless of the size and liquidity positions of banks.

For Malaysia, Alaro and Hakeem (2011) and Sanrego and Rusydiana (2013) have explained that an economic agent substitutes the loan-based credit by the available profit-loss sharing credit in Islamic banks. As a result, this Shari'ah mechanism makes a balance between the monetary and the real sectors of the economy. Similarly, Hasin and Majid (2012) differentiated IBs from CBs based on alternate products on both sides of the Balance Sheet. They found that despite meeting the same demand of the market, Islamic banks' business models are quite different from that of CBs. Notably, Husin (2013) and Sukmana and Kassim (2010) explained that Islamic banks were also playing a vital role in the transmission process of the monetary policy through the "bank credit channel" in Malaysia. Recently, Akhatova, Zainal, and Ibrahim (2016), Hamza and Saddaoui (2018), and Rafay and Farid (2019) confirmed the influences of different MP measures on the credit supply decisions of IBs and CBs. More recently, Rashid, Kabir, and Shah (2020) found the presence of the credit channel of MPTM in Malaysia. They also found that compared to CBs, IBs are less affected by monetary policy changes. Finally, they showed that small-sized and less-liquid banks are influenced more by monetary policy changes as compared to large-sized and more-liquid banks.

In a nutshell, based on the unique contractual and motivational features of IBs, we need to empirically know the role of IBs in the MPTM. Knowing this is of importance for designing and implementing an effective MP to cost-effectively achieve the macroeconomic objectives of the policy. Nevertheless, the existing empirical literature on the "bank-centric view" remains silent concerning the role of IBs in establishing the effects of MP on the real activities through changing the amount of lendable funds available in the economy. This paper, therefore, aims to examine the presence of the "bank credit channel" of MP in Pakistan and to compare the effectiveness of the channel for Islamic *versus* conventional banks. By doing this, the paper will provide first-hand evidence on the relative role of Islamic banking in MPTM.

Design of Methodology

This paper uses a sample of five IBs, six Islamic branches/divisions of CBs and 17 CBs. To carry out the empirical investigation, an unbalanced annual panel data for the period 2005-2017 is utilized. The data on bank-specific factors are collected from the Financial Statements of banks. The data on other variables are taken from the "State Bank of Pakistan (SBP)", International Financial Statistics, and Orbis Bank Focus

(Bankscope). Some data of conventional banks are taken from Datastream, Thomson Reuters.

Following Janjua, Rashid, and Qurrat-ul-Ain (2014) and Kashyap and Stein (1994), we estimate the following model to know the presence of BCC in Pakistan.

$$
\begin{aligned}
BCS_{it} = {} & f_i + \beta_1 BCS_{it-1} + \beta_2 BS_{it} + \beta_3 BL_{it} + \beta_4 BC_{it} + \beta_5 BCOR_{it} + \beta_6 BCR_{it} + \beta_7 BP_{it} \\
& + \beta_8 BDER_{it} + \beta_9 MPM_t + \beta_{10} GDPG_t + \beta_{11} INF_t + y_t + \epsilon_{it}
\end{aligned}
\quad\ldots(1)
$$

where $\overline{BCS_{it}}$ is bank credit (financing) supply of conventional (Islamic) bank i in year t. $BS_{it}, BL_{it}, BC_{it}, BCOR_{it}$ and $\overline{BCR_{it}}$ are "bank size", "bank liquidity", "bank capital", "bank coverage ratio", and "bank credit risk", respectively. Similarly, $\overline{BP_{it}}$ and $\overline{BDER_{it}}$ are bank profitability and bank debt to equity ratio, respectively. $\overline{MPM_t}$ is one of the PM measures (lending rate, deposit rate, and spread between these two rates). $\overline{GDPG_t}$ and $\overline{INF_t}$ are GDP growth at constant prices and inflation based on consumer price index, respectively. $\overline{f_i}$ and $\overline{y_t}$ are firm- and year-specific fixed effects, respectively. $\overline{\epsilon_{it}}$ is the error term. We include a one-period lag of $\overline{BCS_{it}}$ in the specification to control for persistent in credit supply. Following prior studies, the bank-specific and macroeconomic control variables are selected (Janjua, Rashid, & Qurrat-ul-Ain, 2014; Kashyap & Stein, 1994). The definition of bank-specific variables is given in Table 1.

To examine the existence of BCC in the case of both IBs and CBs, we estimate the model given in (2), where we interact the MP measure with the banking type indicator.

$$
\begin{aligned}
BCS_{it} = {} & f_i + \beta_1 BCS_{it-1} + \beta_2 BS_{it} + \beta_3 BL_{it} + \beta_4 BC_{it} + \beta_5 BCOR_{it} + \beta_6 BCR_{it} + \beta_7 BP_{it} \\
& + \beta_8 BDER_{it} + \beta_9 MPM_t \times D_i^{IB} + \beta_{10} MPM_t \times D_i^{CB} + \beta_{11} GDPG_t + \beta_{12} INF_t + y_t + \epsilon_{it}
\end{aligned}
\quad\ldots(2)
$$

where $D_i^{IB}(D_i^{CB})$ is a dummy variable taking a value of one for IB (CB), and zero otherwise. Other variables are defined as in equation (1).

Table 1: *Definition of Bank-Specific Variables*

Variables	Description
Bank Credit Supply	Gross Financing/Total Assets
Bank Size	Log of Total Assets
Bank Liquidity	Cash & Equivalents/Total Assets
Bank Capital	Total Shareholder Equity/Total Assets
Bank Coverage Ratio	EBIT/Interest Expanse
Bank Credit Risk	Ratio of Classified Loans/Total Loans
Bank Profitability	Profit after Tax/Total Assets
Bank Debt to Equity Ratio	Debt/Equity

The models depicted in (1) and (2) are dynamic in nature as they include a one-period lagged dependent variable as an explanatory variable to control the inertia/persistence in credit supply decisions of banks. It is very likely that the lagged of dependent variable is correlated with the error term, which creates the problem of endogeneity. Therefore, we use the "robust two-step system Generalized Method of Moments (GMM) estimator", which yields robust estimation results in such situations and is also called the dynamic panel data estimator. We use the lagged explanatory variables both at their levels and first differences as instruments and apply the "J-test" of Hansen (1982) and the "AR(2) test" of Arellano and Bond (1991) to assure the instruments are orthogonal to the residuals and the residuals do not suffer from the issue of 2nd order sequential correlations, respectively.

Empirical Findings

The Impact of MP on Credit Supply

The results of the baseline model are presented in Table 2. Panel A and Panel B display the estimated parameters and diagnostic tests, respectively. We run three regression models by considering three different MP measures. For all the three models, the diagnostic tests ensure the orthogonality of the used instruments. Further, the tests do not provide any significant evidence of the presence of the serial correlations in the residuals obtained from all three models.

The estimated value of the coefficients reveals that all three MP measures are significantly and negatively related to banks' credit supply decisions, confirming the existence of BCC in Pakistan. These findings imply that banks significantly decrease the total amount of loans issued to business firms and consumers in periods when interest rates are higher. We also show that the negative effects of MP on banks' financing activities are robust to different measures of MP. Interestingly, it should be noted that all the three measures not only negatively affect credit supply but also the size of the

estimated coefficient is quite similar. Taking the face value of the coefficient, a one percent rise in the interest rate will lead to q decrease in the ratio of gross financing to total assets by approximately .022 on average, holding other variables constant at their mean values. The presence of a "bank credit channel" suggests that MP actions spillover to the real economy by significantly affecting the total amount of credit banks can issue for the purchase of capital and consumer goods in the economy. These findings are not only consistent with our predictions but also are in accordance with the findings of several previous studies (Hasin & Majid, 2012; Janjua, Rashid, & Qurrat-Ul-Ain, 2014; Kashyab & Stein, 1994; Sharpe, 1995).

In Model 1(a) of Table 2, the results suggest that banks' credit supply decisions in current periods are significantly related to the one-period lagged credit supply. This finding suggests that those banks which issue more credit in the current year will continue to offer more credits in the future. Inspecting the coefficients of the bank-specific determinants, we observe that bank size, capital, coverage ratio, and profitability are significantly positively related to the total amount of credit issued by banks. These findings suggest that larger banks, more profitable banks, and the banks having more capital are likely to issue more credit to the economy. Similarly, we find that banks having higher debt-equity ratios are also expected to offer more credit supply. On the contrary, we find that banks that face higher credit risks issue significantly less credit to the economy. Finally, we also find that bank liquidity does not appear to play any significant role in determining the credit supply of banks in Pakistan. The findings on the effects of bank-specific variables are in accordance with the findings of several previous studies (Alper, Hulagu, & Keles, 2012; Bernanke, Lown, & Friedman, 1991; Girardin & Moussa, 2011; Hasin & Majid, 2012; Janjua, Rashid, & Qurrat-ul-Ain, 2014; Köhler, Hommel, & Grote, 2006; Schmitz, 2004).

Likewise, our findings on the coverage ratio and credit risk complement the findings of Alaro and Hakeem (2011), Kaleem and Isa (2006), and Sanrego and Nikmawati (2010). Credit risk appears to be negatively related to banks' credit supply, suggesting that when the credit risk of a bank increases, the bank becomes conscious in issuing loans. This finding is in line with the findings of Pruteanu (2007), who has explained that classified loans become a basic source of increasing credit risk.

Table 2: *Effects of MP on Banks' Credit Supply*

| | Panel A: Estimation Results | | | | | |
| | Model 1(a) | | Model 1(b) | | Model 1(c) | |
Variables	Coefficient	SE	Coefficient	SE	Coefficient	SE
Lagged Bank Credit Supply	.721***	.121	.708***	.042	.729***	.052
Bank Size	.062***	.021	. 023***	.013	.036**	.014
Bank Liquidity	-.301	.360	-.170	.132	- .239	.111
Bank Capital	.007***	.001	.006***	.002	.005***	.001
Bank Coverage Ratio	.007**	.002	.004**	.003	.000***	.001
Bank Credit Risk	-0.038***	.011	- .049***	.015	-.022***	.013
Bank Profitability	.016***	.003	.012***	.004	0.024***	.007
Bank Debt-Equity Ratio	.004**	.001	.002**	.001	0.003**	.001
Lending Interest Rate	-.021***	.004				
Interest Rate Spread			-.023***	.004		
Deposit Rate					-.022***	.005
GDP Growth	.273**	.132	.223**	.105	.354**	.145
Inflation	.071***	.022	.037***	.008	.018**	.007
Constants	39.534**	14.324	28.818**	8.886	17.224***	5.783
Panel B: Diagnostic Tests						
Observations	248		248		248	
Banks	27		27		27	
AR(2)	.56		.34		.62	
p-value	.642		.266		.582	
J-statistic	12.17		14.52		15.32	
p-value	.842		.902		.942	

*Note: *** $p<.01$, ** $p<.05$*

GDP growth is found to affect the credit supply of banks positively and significantly in all three regressions, suggesting that increased GDP growth will result in an increase in the credit supply of banks. A possible justification for this finding is that there is a substantial reward for supplying funds in a growing economy. Inflation is also found to have a positive and statistically significant influence on the credit supply decisions of banks in Pakistan. The findings on the bank-specific and macroeconomic determinants of the credit supply are generally similar in all the three estimated regression equations in terms of sign and statistical significance.

The Impact of MP Actions on IBs versus CBs

After having confirmed the presence of BCC in the economy, we see whether MP actions affect Islamic and conventional banks' credit supply decisions differently.

Specifically, we estimate the extended model given in (2) and the estimation results are given in Table 3, which is constructed similar to Table 2. Both diagnostic tests' results ratify the validity of the instruments in all the specifications.

The results on the effects of bank-specific and macroeconomic variables are quite similar to those in Table 2, in terms of their significance and sign. However, there are two exceptions. The first one is that the variable bank liquidity now statistically appears in Model 2(b) and Model 2(c). The second one is the coefficient of bank coverage ratio, which now appears statistically insignificant, but only in Model 2(c). We do not do commentary on these results to economize space. Rather, we emphasize on the differential response of IBs' and CBs' credit supply decisions to MP actions.

Differential Response of IBs and CBs: The results of all the three regressions given in Table 3 reveal that the underlying MP measures are significantly negatively related to the credit supply decisions of both IBs and CBs. These results suggest that both types of banks decrease their supply of credit during periods of tight monetary policy. This piece of evidence implies that BCC exists and effectively works in transferring the effects of MP actions to the economy in the case of both IBs and CBs. Nonetheless, one should note that consistent with our prediction, the negative impact of MP measures is weaker in the case of IBs as compared to their conventional peers. This finding implies that compared to CBs, IBs respond less to monetary tightening in Pakistan. The less response of IBs in terms of issuing finance is mainly attributed to the fact that IBs' financing activities are not based on the interest rate. Rather, they invest or finance to both business firms and consumers using a variety of Islamic contracts such as Qar'd-ul-Hassan, Mudarabah, Musharakah, Ijarah, Salam, Istisnah, and Murabahah. These are sale-based, partnership-based, and lease-based contracts between IBs' and their clients. Therefore, IBs respond less to monetary policy changes. Said differently, owing to distinguishing features and the banking models based on the Shariah principles, IBs are expected to be less affected by any predictable or unpredictable change in the monetary policy.

Our findings suggest that although BCC exists in the case of both types of banking, it is relatively less effective in IBs. This may make it difficult for Pakistan's monetary authorities to cost-effectively attain the macroeconomic targets of the MP. These findings suggest that policymakers should take into account the different nature of Islamic banking while designing different strategies and selecting different instruments to implement the MP in the economy. It may otherwise be challenging for the authorities to achieve the set targets of the MP. The existence of the "bank credit channel" of MPTM in IBs should also be regarded as a caution and managements of IBs should design such Islamic financing products that should not be highly affected by any change in the market

interest or policy rate.

Table 3: *Differential Impact of MP on Credit Supply of IBs and CBs*

Panel A: Estimation Results						
	Model 2(a)		Model 2(b)		Mode 2(c)	
Variables	Coefficient	SE	Coefficient	SE	Coefficient	SE
Lagged Bank Credit Supply	.634***	.094	.774***	.062	.642***	.038
Banks Size	.064***	.028	.084***	.022	.074***	.016
Banks Liquidity	-.432***	.112	-.112	.274	-.422***	.108
Banks Capital	.008**	.004	.006**	.003	.009***	.002
Bank Coverage Ratio	.003*	.002	.004**	.002	-.001*	.001
Bank Credit Risk	-.442***	.186	-.542***	.126	-.438**	.212
Banks Profitability	.012***	.003	.028***	.006	.022***	.006
Bank Debt-Equity ratio	.004***	.001	.006***	.002	.008**	.004
Lending Rate $\times D^{CB}$	-.028***	.006				
Lending Rate $\times D^{IB}$	-.012**	.005				
Interest Rate Spread$\times D^{CB}$			-.052***	.012		
Interest Rate Spread$\times D^{IB}$			-.028***	.006		
Deposit Rate $\times D^{CB}$					-.034***	.007
Deposit Rate $\times D^{IB}$					-.014**	.006
GDP Growth	.128***	.024	.238***	.057	.424***	.054
Inflation	.038**	.021	.019**	.007	.028***	.006
Constants	42.246***	12.082	72.742***	21.652	22.622**	11.437
Panel B: Diagnostic Tests						
Observations	248		248		248	
Banks	27		27		27	
AR (2)	.72		.26		.74	
P-value	.390		.642		.432	
J-statistic	16.20		18.12		16.92	
p-value	.956		.892		.964	

*Note: *** p<.01, ** p<.05, * p<.1*

Conclusions and Policy Recommendations

The "bank credit channel" of MP transmission has attained increased attention after the financial crisis of 2007-2008. Although several researchers have studied the role of CBs in the MPTM, we know relatively less regarding the behaviors of IBs during periods of tight MP. Further, there is scarce evidence on the existence of a "bank credit channel" in emerging and developing countries like Pakistan. Therefore, the first objective of the paper is to see whether the "credit channel" of MP transmission exists in Pakistan using individual bank-level data on banks' credit supply and by considering three different MP measures. The second goal of the paper is to examine the relative role of IBs in the MPTM. To do so, we utilize an unbalanced annual panel dataset of a sample of 27 IBs and CBs of Pakistan. The "robust two-step system – GMM estimator" is applied to mitigate the potential endogeneity problem and to take into consideration the dynamic nature of banks' credit supply decisions. The empirical analysis covers the period 2005-2016.

Estimating the baseline model, the paper provides strong evidence on the presence of the "credit channel" of MP in Pakistan. These results imply that banks operating in Pakistan significantly reduce their supply of credit to the economy in episodes of tight MP. The results from the extended model indicate that although the "credit channel" exists in the case of IBs, IBs' credit supply is relatively less adversely affected by increased policy rates. This finding implies that although both IBs and CBs cut the amount of financing they supply during episodes of tight MP, IBs do so by fewer amounts.

The findings on the existence of a "bank credit channel", in the case of both IBs and CBs have several important implications for the monetary authorities of Pakistan and other countries having a dual banking system. Specifically, the findings recommend that the central bank can effectively use the interest rate as an instrument of MP to manage credit supply in the economy. The findings also suggest that it is essential to consider the nature of Islamic banking at the time of designing MP and while devising instruments to manage the credit supply in the economy, otherwise it may make it difficult to achieve the set macroeconomic objectives. Form the Islamic banking stakeholders' point of view, the significant evidence on the influence of increased interest rates on IBs' credit expansion questions the existing business models and financing modes of IBs and suggests them to design Islamic financing products that may not be immensely influenced by any alterations in interest rates. IBs can achieve this by avoiding policy rate considerations and by considering both productivity and economic growth rate as a benchmark for each offering. Our analysis can be further extended by taking into account the size and liquidity position of banks while examining the MP effects.

References

Akhatova, M., Zainal, M. P., & Ibrahim, M. H. (2016). Banking models and monetary transmission mechanisms in Malaysia: Are Islamic banks different? *Economic Papers: A Journal of Applied Economics and Policy*, *35*(2), 169-183.

Alaro, A. R., & Hakeem, M. (2011). Financial engineering and financial stability: The role of Islamic financial system. *Journal of Islamic Economics, Banking and Finance*, *7*(1), 34-55.

Alper, K., Hulagu, T., & Keles, G. (2012). *An empirical study on liquidity and bank lending* (No. w4-2012). Central Bank of the Republic of Turkey.

Anwar, S., & Nguyend, L. P. (2018). Channels of monetary policy transmission in Vietnam. *Journal of Policy Modelling*, *40*(4), 709-729.

Auclert, A. (2017). *Monetary policy and the redistribution channel* (No. w23451). National Bureau of Economic Research.

Aysun, U. & Hepp, R. (2013). Identifying the balance sheet and the lending channels of monetary transmission: A loan-level analysis. *Journal of Banking & Finance*, 37(2), 2812-2822.

Bernanke, B. S., & Blinder, A. S. (1988). Is it money or credit, or both or neither? *American Economic Review, 78*(2), 435-439.

Bernanke, B. S., Lown, C. S., & Friedman, B. M. (1991). The Credit Crunch. *Brookings Papers on Economic Activity*, *22*(2), 205-248.

Bernanke, B.S. & Blinder A.S. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, *American Economic Association, 9*(4), 27-48.

Bernanke, B.S., Gertler, M. & Gilchrist, S. (1995). The financial accelerator in a quantitative business cycle framework. *Handbook of Macroeconomics*, 1, 1341-1393.

Carvalho, C., & Nechio, F. (2014). Do people understand monetary policy?. *Journal of Monetary Economics, 66*(1), 108-123.

Cecchetti, S. G. (1999). *Legal structure, financial structure, and the monetary policy transmission mechanism* (No. w7151). National Bureau of Economic Research.

Ehrmann, M., & Smets, F. (2003). Uncertain potential output: implications for monetary policy. *Journal of Economic Dynamics and Control*, *27*(9), 1611-1638.

Erdogdu, A. (2017). Functioning and effectiveness of monetary transmission mechanisms: Turkey applications. *Journal of Finance and Bank Management*, *5*(1), 29-41.

Evans, C., Fisher, J., Gourio, F., & Kran, S. (2015). Risk management for monetary policy near the zero-lower bound. *Brookings Papers on Economic Activity*, 2015(1), 141-219.

Girardin, E., & Moussa, Z. (2011). Quantitative easing works: Lessons from the unique experience in Japan 2001–2006. *Journal of International Financial Markets, Institutions and Money*, *21*(2), 461-495.

Hamza, H., & Saadaoui, Z. (2018). Monetary transmission through the debt financing channel of Islamic banks: Does PSIA play a role? *Research in International Business and Finance*, *45*(3), 557-570.

Hardianto, E. (2004). Shariah transmission mechanism in Indonesia. *Journal of Economic Cooperation and Development*, *8*(2), 20-38.

Hasin, Z. & Majid, M. S. (2012). Islamic banks and monetary transmission mechanism in Malaysia. *Journal of Economic Cooperation and Development*, *35*(2), 137-166.

Husin, M. M. (2013). Efficiency of monetary policy transmission mechanism via profit rate channel for Islamic banks in Malaysia. *Journal of Contemporary Issues in Business Research*, *2*(2), 44-55.

Janjua, P. Z., Rashid, A., & Qurrat-ul-Ain. (2014). Impact of monetary policy on bank balance sheet in Pakistan. *International Journal of Economics and Finance, 6*(11), 187-196.

Jermann, U. (2019). *Negative swap spreads and limited arbitrage* (No. w25422). National Bureau of Economic Research.

Kaleem, A., & Isa, M. M. (2006). Islamic banking and money demand function in Malaysia. *Pakistan Economic and Social Review*, *44*(2), 277-290.

Kashyap, A. K., & Stein, J. C. (1994). Monetary policy and bank lending in monetary policy. *National Bureau of Economic Research Studies in Business Cycles*, *12*(2), 221-262.

Kashyap, A. K., & Stein, J. C. (1995, June). The impact of monetary policy on bank balance sheets. In *Carnegie-Rochester Conference Series on Public Policy*, *42*(1), 151-195.

Kashyap, A. K., & Stein, J. C. (1997). The role of banks in monetary policy: A survey with implications for the European monetary union. Economic Perspectives-Federal Reserve Bank of Chicago, *21*(3), 2-18.

Kashyap, A. K., & Stein, J. C. (2000). What do a million observations on banks say about the transmission of monetary policy? *American Economic Review*, *90*(3), 407-428.

Kishan, R. P., & T. P. Opiela. (2000). Bank size, bank capital, and the bank lending channel. *Journal of Money, Credit and Banking*, *32*(1), 121-141.

Köhler, M., Judith H., & Matthias, G. (2006). *The role of banks in the transmission of monetary policy in the Baltics (No. w*06-005*).* Centre for European Economic Research.

Mishkin, F. S. (2008). How should we respond to asset price bubbles? *Financial Stability Review, 12*(1), 65-74.

Mishra, P., Montiel, P., & Spilimbergo, A. (2012). How Effective Is Monetary Transmission in Low- Income Countries? A Survey of the Empirical Evidence. *Economic Systems, 37(2)*, 187-216.

Nosheen & Rashid, A. (2019). Business Orientation, Efficiency, and Credit Quality across Business Cycle: Islamic versus Conventional Banking. Are there any Lessons for Europe and Baltic States? *Baltic Journal of Economics, 19*(1), 105-135.

Pruteanu-Podpiera, A. M. (2007). The role of banks in the Czech monetary policy transmission mechanism. *Economics of Transition*, *15*(2), 393-428.

Rafay. A., & Farid, S., (2019). Islamic banking system: A credit channel of monetary policy: Evidence from an emerging economy, *Economic Research-Ekonomska Istraživanja*, *32*(1), 742-754.

Rashid, A., Hassan, M. K., & Shah, M. A. R. (2020). On the role of Islamic and conventional banks in the monetary policy transmission in Malaysia: Do bank size and liquidity matter?. *Research in International Business and Finance*, forthcoming.

Sanrego, Y. D., & Nikmawati, K. (2010). Transmission mechanism of sharia financing in Malaysia. *The Journal of Muamalat & Islamic Finance Research*, *7*(1), 121-135.

Sanrego, Y. D., & Rusydiana A. S. (2013), Transmission mechanism in dual monetary system: Comparison between Shariah and conventional monetary system. *Journal of Islamic Economics, Banking and Finance*, *9*(2), 111-124.

Santis, R. A., & Surico, P. (2013). Bank lending and monetary transmission in the Euro area. *Economic Policy*, *28*(75), 423–457.

Schmitz, B. (2004). What role do banks play in monetary policy transmission in EU accession countries. In *3rd Macroeconomic Policy Research Workshop*.

Shah, M. A. R., Rashid, A., & Zaman, M. K. (2017). Capital Structure Decisions in Islamic Banking: Empirical Evidence from Pakistan. *Journal of Islamic Banking and Finance*, *34*(2), 88-103.

Sukmana, R., & Kassim, S. H. (2010). Roles of the Islamic banks in the monetary transmission in Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management, 3*(1), 7-19.

Taylor, J. B. (1995). The Monetary Transmission Mechanism: An Empirical Framework. *Journal of Economic Perspectives, 9*(4), 11-26.

Tenreyro, S., & Gregory, T. (2016). Pushing on a String: US Monetary Policy Is Less Powerful in Recessions. *American Economic Journal: Macroeconomics, 8*(4), 43-74.

Wong, K. (2000). Variability in the effects of monetary policy on economic activity. *Journal of Money, Credit and Banking, 32*(2), 179-198.

Zaheer, S., Ongena, S., & Van Wijnbergen, S. (2013). The transmission of monetary policy through conventional and Islamic banks. *European Banking Center Discussion Paper,* (2011-018), 2011-078.