Do Bank Size and Liquidity Position Matter in the Monetary Policy Transmission Mechanism?
Evidence from Islamic and Conventional Banks in Pakistan

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Abstract

An empirical examination of the tight monetary policy effects on the financing decisions of Islamic banks is of significance for an in-depth understanding of the credit channel of monetary policy. Therefore, this paper aimed at examining the relative role of Islamic and conventional banks in transmitting the effects of monetary tightening in Pakistan. It also examines whether the effects of tight monetary policy on banks' credit expansion differ across bank size and liquidity position. The empirical analysis is based on a sample of five full-fledged Islamic banks, six Islamic branches of conventional banks, and seventeen conventional banks. The robust two-step system-Generalize Method of Moments estimator is applied on an unbalanced annual bank-level panel dataset covering the period 2005-2016. The results reveal that both types of banks significantly cut their financing in periods of tight monetary policy, confirming the existence of the credit channel. The results also indicate that Islamic banks are affected less by the tight monetary policy as compared to their conventional peers. The results also provide evidence that large-sized and more-liquid Islamic as well as conventional banks respond less to the monetary policy tightening. The findings suggest that the monetary policy authorities may take into consideration the type of banking, bank size, and liquidity position while devising any monetary policy instruments to effectively manage credit supply in the economy.

1. Introduction

The primary objectives of monetary policy (hereafter MP) are to enhance economic development and growth and achieve the financial stability of the economic system. According to the traditional theories of MP, regulating money supply is the main instrument, which is used to attain these objectives. Advocates of these theories argue that any changes in the money supply will affect interest rates and aggregate spending in an economy (Friedman and Schwartz, 1963; King and Plosser, 1984; Sims, 1992). In contrast, according to the new monetary policy theories, commercial banks also have essential roles to play in the monetary policy transmission mechanism (hereafter MPTM) (Kashyap and Stein, 1994; Bernanke and Gertler, &, Gilchris, 1995). Nevertheless, the extent to which banks accelerate the transmission process of MP mainly depends on three aspects: (1) how much the banks are dependent on their deposits, (2) how banks' credit expansion is affected by MP shocks, and (3) how much investors and consumers are dependent on bank borrowings.

In principle, the effect of MP on the economy can be channelized through various channels. These channels commonly include the asset-pricing channel, the interest rate channel, the exchange rate channel, and the credit channel. However, the credit channel of banks (aka. "bank-centric view of monetary transmission") vastly discussed and criticized after the 2007-08 financial crisis has adversely influenced the stability of economic and financial sectors in many developed and developing countries. This channel emphasizes the role of the banking sector in MPTM. It mainly works through two other channels viz. "the bank lending channel" and "the balance sheet channel" (Bernanke, Gertler, & Gilchris, 1995). Keeping in view the failure of the conventional interest rate channel, Mishkin (1996) is perhaps the first one who formally explained the credit channel of MPTM by introducing the role of asymmetric information in capital markets.

Through a comprehensive review of the empirical literature, it is found that several known scholars have confirmed MPTM through both the bank lending and balance sheet channels for different economies (Bernanke, 1993; Kashyap & Stein, 1994; Bernanke, Gertler, & Gilchris, 1995; Cecchetti, 1999; Hamza & Saadaoui, 2018). However, these researchers have also reported the effect of MP shocks on banks' lending ability that differs considerably across bank size and banks' liquidity positions.

There are also several recent studies confirming the significance of the role of conventional banks (henceforth CBs) in MPTM (Aysun & Hepp, 2013; Evans, Fisher, Gourio, & Kran, 2015; Auclert, 2017; Erdogdu, 2017; Anwar & Nguyend, 2018; Jermann, 2019). However, in the last two decades, in several Muslim and in non-Muslim countries, Islamic banking has attracted the attention of scholars, policymakers, bankers, customers, and investors. In particular, the Islamic financial system in general and Islamic baking in specific became popular during and after the 2007-08 global financial crises. Currently, several countries across the globe are running both Islamic and conventional banking in parallel. Examples of these countries are Pakistan, Malaysia, Bahrain, UEA, and Turkey. Definitely, in the countries having a dual banking system, any change in MP transmits to the economy through both Islamic banks (IBs) and conventional banks. However, compared to CBs, IBs

are expected to respond differently to tight MP. We argue this because IBs are quite different in the nature and composition of assets and liabilities as compared to their conventional counterparts (Nosheen & Rashid, 2019). The fundamental characteristics of Islamic banking are the prohibition of interest, sharing profits and losses, sharing risks, and assets-backed business transactions (Chaudary & Mirakhor, 1997). Further, IBs are prohibited to involve in any speculative activities as financial derivatives (Farahani & Dastan, 2013). Finally, IBs are morally responsible for doing the investments that benefit to general masses and positively contribute to the growth of the real economy. IBs having these exclusive characteristics are highly likely to play a quite different role than the role of their conventional counterparts in MPTM.

Indeed, by considering the unique contractual and motivational features of Islamic financial institutions (IFIs), there are numerous studies that have investigated the influence of MP shocks on Islamic banking sector's financing (Hardianto, 2004; Kaleem & Isa, 2006; Sukmana & Kassim, 2010; Ibrahim, 2017; Rafay & Farid, 2019). Nevertheless, it should be noted that these studies have utilized aggregated data rather than the bank-level data. One should also note that the study of Zaheer, Ongena, and Wijnbergen (2013) is an exception, which has used a panel dataset of 40 banks including Islamic banking branches of the CBs from Pakistan. They provided evidence that IBs continue to grow their financing even in periods of tight MP. Further, they found that the MP contraction has greater effects on small-sized banks than their large-sized counterparts.[1]

No doubt, empirical investigation of the response of IBs and CBs to the MP tightening based on bank-level data would be highly significant for understanding MPTM and for selecting effective MP instruments to attain effectively the macroeconomic objectives of the policy. Given the strong empirical findings on the role of banks in MPTM in the literature and the stylized facts regarding the growth of IBs across the globe (Rashid, Riaz, & Zaffar, 2017), it would be interesting to examine whether IBs play a different role in MPTM than that of their conventional peers. Knowing this is very important for designing an effective MP in economies with dual banking systems. It will be also useful to study whether the size of a bank and its liquidity position matter in formulating its response to tight MP.

Many studies have documented significant evidence on the presence of the credit channel and the role of bank size and liquidity in establishing this channel in the context of CBs (Kashyap & Stein, 1994; Schmitz, 2004; Hasin & Majid, 2012; Janjua, Rashid, & Qurrat-ul-Ain, 2014). Nonetheless, to the best of our knowledge, no empirical research has hitherto been conducted, which empirically examines these phenomena for IBs. To bridge this vacuum, this paper provides first-hand empirical evidence on the relative role of IBs and CBs in transmitting the MP effects. The paper also provides a preliminary examination of the role of size and liquidity position of both types of banks in formulating their reactions to the MP tightening. For this purpose, we have utilized a sample of seventeen CBs and eleven IBs (five full-fledged IBs, and six Islamic branches/divisions of CBs) of Pakistan. The dynamic panel data (aka. system-GMM) estimator developed by Arellano and Bover (1995) and

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[1] See Literature Review in the next section for how our study differs from Zaheer, Ongena, and Wijnbergen (2013).

Blundell and Bond (1998) has been applied to carry out the empirical analysis. This estimator enables scholars to mitigate the problem of cross-sectional heteroskedasticity and endogeneity.

This paper contributes to the literature on the MPTM in several different aspects. First, the majority of prior studies have emphasized on CBs while examining the credit channel of MP (Kashyap & Stein, 1994; Janjua, Rashid, & Qurrat-ul-Ain, 2014), whereas, we examine this issue for both CBs and IBs. Second, unlike prior studies in Pakistan that do not consider the size and liquidity positions of IBs (e.g., Zaheer, Ongena, & Wijnbergen, 2013; Rafay & Farid, 2019), we divide both IBs and CBs based on their size and liquidity position while examining the tight MP effects on banks' credit supply. Third, our analytical framework enables us to directly compare the effects of MP on banks' credit supply across bank types (Islamic *versus* conventional), across bank size (small *versus* large), and across liquidity position (less *versus* more liquid).

The rest of the paper is structured as follows. Section 2 presents a review of the empirical literature on MPTM. Section 3 explains the data and presents the empirical framework. Section 4 displays the empirical findings. Finally, Section 5 presents some conclusions and policy recommendations.

2. Review of Empirical Literature

The choice and effectiveness of different policy instruments critically depend on the way MPTM occurs in the economy. MPTM is a link between changes in monetary instruments (money supply and interest rates) and the real and nominal macroeconomic indicators such as output, wages, prices of goods and services, exchange rates, and employment level. Both theorists and empiricists have identified several ways through which MP impacts the economy. Among these channels, recently, the credit channel has gained attention from the academicians and policymakers, specifically after the 2007-08 financial crisis. This channel mainly works through the bank-lending and balance sheet channels. The bank-lending channel works mainly through the response of credit supply to the MP tightening. Hence, the credit channel can be said as an enhancement mechanism of the interest rate channel of MPTM. Bernanke and Blinder (1988) are the first who explained the role of banks in MPTM.

Later on, Bernanke and Blinder (1995), Kashyap and Stein (1994, 1995, 2000), and Kishan and Opiela (2000) confirmed the presence of the bank-lending channel in the USA. Bernanke, Gertler, and Gilchrist (1999) extended the New Keynesian model to take into consideration the balance sheet channel of MPTM. Kashyap and Stein (1994) documented that small-sized banks decreased their financing more than large-sized banks in the response of the tight MP in the USA. Similarly, Kashyap and Stein (1994), Cecchetti (1999), Ehrmann and Smets (2003) and Santis and Surico (2013) provided significant evidence on the credit channel for the EU countries. In the same vein, several other empirical studies including Bernanke, Lown, and Friedman (1991), Gertler and Gilchrist (1993), Kashyab and Stein (1995), Wong (2000), Aysun and Hepp (2013), Evans, Fisher, Gourio, and Kran (2015), Auclert (2017), Erdogdu (2017), Anwar and Nguyend (2018), and Jermann (2019) also documented significant evidence, favouring the credit channel of MPTM.

By applying different and robust econometric techniques, Cevik and Charap (2015), Sanrego and Rusydiana (2013), Alaro and Hakeem (2011), Hasin and Majid (2012), and Ibrahim (2005), and Azali (2003) provided conclusive evidence on the existence of the credit channel in the examined countries. Recently, Evans, Fisher, Gourio, and Kran (2015), Ekimova, Kolmakov, and Polyakova (2017), and Olmo, Azofra, and Sáiz (2018), while exploring the banks' centric view of monetary policy transmission mechanism, provided evidence that the role of banks is significant and important in MPTM in the economy. Further, Hussain (2014) investigated the relative importance of credit and interest rate channels of MP by applying a vector autoregressive approach for Pakistan. He found that the credit channel was dominant during the period 1991-2000, whereas, the interest rate channel appeared more significant over the period 2001-2012.

Another bank-level study by Janjua, Rashid, and Qurrat-ul-Ain (2014) empirically examined the presence of the bank-centric view of credit supply in Pakistan for the period 2006-2012. They used three different measures of MP and considered the size of banks as a moderator. They found that there is a significant negative association between monetary measures and the credit supply decisions of banks. They also show that small-sized banks are likely to be more affected than large-sized banks during episodes of the tight MP. However, they did not distinguish the banks included in the sample as IBs and CBs. They also not took into account the level of liquidity while investigating the effects of MP shocks on the financing decisions of banks.

The above-reviewed literature provides significant evidence on the presence of the credit channel of MPTM in different countries across the globe. The focus of these studies was only on CBs. However, there is another strand of literature, which has emphasized the role of Islamic banking in transmitting MP shocks. IBs are growing in terms of assets and deposits across the globe (Sukmana & Kassim, 2010; Rashid, Riaz, & Zaffar, 2017). The effectiveness of any monetary measures critically depends on how both IBs and CBs are being affected by any change in the MP.

The existing empirical works on the significance of IBs in MPTM have mainly examined the effects of MP shocks by using the aggregated data on Islamic financing (Hardianto, 2004; Kaleem & Isa, 2006; Sukmana & Kassim, 2010; Rafay & Farid, 2019). The key finding of these studies is that the MP shocks have significant negative impacts on Islamic financing. Recently, Omer (2019) found that the effects of MP shocks on the retail prices of IBs are similar to those for CBs. Moreover, he showed that when extra liquidity of IBs is controlled through different measures, the impact of the policy rate on returns of IBs even becomes more profound. More recently, Rafay and Farid (2019), Zulkhibri and Sukmana (2017), Akhatova, Zainal, and Ibrahim (2016) and Stepanchuk and Tsyrennikov (2015) evaluated the relative validity of the credit channel of IBs and CBs by considering different MP measures. The results show the presence of the credit channel in both types of banking. Hamza and Saadaoui (2018) have confirmed the transmission of MP through IBs' credit channel.

By reviewing the existing literature on Pakistan, we find that there is only one study by Zaheer, Ongena, and Wijnbergen (2013), which has empirically investigated the effects of MP shocks on banks' financing decisions using bank-level panel date. The authors using a large sample of both IBs and CBs operation in Pakistan found that banks play an important role in transmitting the MP effects. They also found that although the response of IBs differs from small banks, they behave similar to large banks in the economy during episodes of tight MP.

Nonetheless, it should be noted that our paper significantly departs from the study of Zaheer, Ongena, and Wijnbergen (2013) on several grounds. First, we use an extended sample period of 2005-2016, whereas, their sample period was 2002-2010 when the share of Islamic financing was relatively low. Second, we divide both IBs and CBs based on bank size and liquidity position, whereas, they divided only CBs. Third, we use several bank-specific and macroeconomic variables as control variables in our specification. Last but not least, we apply the two-step system GMM estimator, which is very effective in the case of dynamic models and in controlling the problem of cross-section heteroskedasticity and endogeneity.

3. Empirical Framework, Data, and Estimation Method

3.1 Empirical Models

To achieve the first objective of the study, we augment the empirical model estimated by Kashyap and Stein (1994) Janjua, Rashid, and Qurrat-ul-Ain (2014) by including dummies for bank size. Specifically, we interact small-sized bank dummy (D_{it}^{Small}) and large-sized bank dummy (D_{it}^{Large}) with the MP indicators to examine the differential impact of the tight MP on bank credit supply across small- and large-sized banks. The model takes the following form.

$$Y_{it} = \rho_i + X_{it}\alpha + Z_t\theta + \beta_1 KIBOR_t \times D_{it}^{Small} + \beta_2 KIBOR_t \times D_{it}^{Large} + \mu_t + \varepsilon_{it} \qquad (1)$$

where:

Y_{it} = Banks' credit supply.
X_{it} = A matrix of bank-specific variables.
Z_t = A matrix of macroeconomic variables, namely GDP growth and inflation rate.
$KIBOR_t$ = A MP measure (The Karachi Interbank Offer Rate – KIBOR).
D_{it}^{Small} = 1, if the log value of total assets of a bank is less in a given year than the mean value of total assets of all banks over the sample period, otherwise 0.
D_{it}^{Large} = 1, if the log value of total assets of a bank is greater in the given year than the mean value of total assets of all banks over the sample period, otherwise 0.
ρ_i = Individual-specific effects
μ_t = Year-specific effects
ε_{it} = Error term

To examine the second objective of the study, we augment the model given in equation (1) by taking into account the banking type as well. In particular, the model is expressed as follows.

$$Y_{it} = \rho_i + X_{it}\alpha + Z_t\theta + \beta_1 KIBOR_t \times D_{it}^{SIB} + \beta_2 KIBOR_t \times D_{it}^{LIB} + \beta_3 KIBOR_t \times D_{it}^{SCB} + \beta_4 KIBOR_t \times D_{it}^{LCB} + \mu_t + \varepsilon_{it}$$

(2)

In equation (2), D_{it}^{SIB}, D_{it}^{LIB}, D_{it}^{SCB} and, D_{it}^{LCB} are the dummies for small IBs, large IBs, small CBs, large CBs, respectively. The dummy variables and the other variables are defined as in equation (1). The estimation of equation (2) allows us to examine the impact of MP tightening on the financing decisions of IBs and CBs across small- *versus* large-sized banks.

To examine the role of a bank's liquidity position in establishing the effects of MP tightening, we re-estimate the equation (1) by interacting liquidity indicators with the monetary measures. Specifically, we estimate the following model.

$$Y_{it} = \rho_i + X_{it}\alpha + Z_t\theta + \beta_1 KIBOR_t \times D_{it}^{LL} + \beta_2 KIBOR_t \times D_{it}^{ML} + \mu_t + \varepsilon_i$$

(3)

where D_{it}^{LL} (D_{it}^{ML}) is the dummy of less-liquid (more-liquid) bank, which takes a value of one if the ratio of cash & cash equivalent to total assets is less (greater) than the mean value of the ratio over the sample period for a given bank and given year, otherwise zero. The remaining variables are defined as in equation (1).

Finally, we estimate another specification where we consider the level of liquidity along with banking type to examine whether the effects of tight MP on the credit supply decisions of IBs and CBs differ across liquidity positions. The model takes the following form.

$$Y_{it} = \rho_i + X_{it}\alpha + Z_t\theta + \beta_1 KIBOR_t \times D_{it}^{LLIB} + \beta_2 KIBOR_t \times D_{it}^{MLIB} + \beta_3 KIBOR_t \times D_{it}^{LLCB} + \beta_4 KIBOR_t \times D_{it}^{MLCB} + \mu_t + \varepsilon_{it}$$

(4)

where $D_{it}^{LLIB}, D_{it}^{MLIB}, D_{it}^{LLCB},$ and D_{it}^{MLCB} are the indicators for less-liquid Islamic banks, more-liquid IBs, less-liquid conventional bank, and more liquid-conventional bank, respectively. These indicators variables are defined as in equation (3) by also taking into account banks' types.

We include a one-period lagged dependent variable as an explanatory variable in all the above models to control the inertia/persistence in the credit supply decisions of banks.

3.2 Data and Sample

This paper uses a sample of seventeen conventional and eleven IBs (five full-fledged IBs and six Islamic branches/divisions of CBs) of Pakistan covering the period 2005-2016. Following the existing literature, the Karachi Interbank Offer Rate (KIBOR) is used as a measure of

MP.[2] The data on bank-specific variables are collected from financial statements of banks, available on their websites. Data on the MP measure are collected from Monetary and Financial Statistics of the State Bank of Pakistan (SBP). We also collected some data from the publications, namely Statistical Publications and Banking Statistics of SBP, World Development Indicators (WDI), International Financial Statistics (IFS) of IMF, and Orbis Bank Focus (Bankscope). Some data of Islamic branches/divisions of CBs have been taken from Thomson Reuters Datastream. The bank-specific variables are defined in Table 1.

Table 1: Bank-Specific Variables

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

The dependent variable in our analysis is the banks' credit supply. Following the existing literature, the banks' credit supply for IBs is defined as the ratio of gross financing to total assets (Akhatova, Zainal, & Ibrahim, 2016), whereas, for CBs, it is defined as the ratio of gross loans to total assets (Kashyap & Stein, 2000).

It is notable that there are some fundamental differences in the accounting treatment of CBs *versus* IBs in financial statements. Especially, Islamic branches of CBs are dealt in annexures of financial statements with the title of "Islamic Banking Business" as an essential requirement of regulator; the central bank. These annexures consist of all basic heads of the business of Islamic banking enabling the users to select their concerned data for Islamic banking and financial products.

In CBs, there is a title of "Loans or Advances" for credit supply, whereas, credit supply is mentioned with the title of "Islamic financing" in IBs. Further, Islamic financing is decomposed into *murābaḥah*, *ijārah*, *mushārakah*, *muḍārabah*, diminishing *mushārakah*, *salam*, and *istiṣnāʿ* in balance sheet items. Technically, the depositors' accounts are also different in the two banking systems. In CBs, there is a loan contract for current and saving accounts, assigning a relationship of lenders and borrowers for depositors and banks, respectively. On the other hand, IBs deal with current accounts generally on loan basis similar to conventional counterparts, but at zero interest rate; whereas, saving and term deposit accounts are titled with "Investment Accounts" in IBs based on the "*muḍārabah*"

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[2] Several previous studies have also used interbank offered rate as the instrument of monetary policy. These studies, among many others, include Schmitz (2004), Amarasekara (2008), Sun, Gan, and Hu (2010), Hanif and Khan (2012), Nguyen, Vu, and Vu (2016), Gómez-González *et al*. (2016), Caporale *et al*. (2016), and Ibrahim (2017).

contract.[3] In data collection, we found that saving accounts and investment accounts had vehicle contracts of loan and *muḍārabah* for CBs and IBs, respectively.

3.3 Estimation Method

The robust two-step system-Generalize Method of Moments (GMM) estimator is applied for estimation to mitigate the problem of endogeneity because it is highly likely that the lagged dependent variable may correlate with the error term. This estimator was initially proposed by Arellano and Bover (1995) and then it was fully developed by Blundell and Bond (1998). The robustness of the results of the system GMM estimator critically depends on the validity of the instruments used in the estimation. Therefore, the J-test of Hansen (1982) is applied to test the null hypothesis that the instruments are orthogonal to the error term. Further, it is also essential to make sure the estimated residuals from the model are free from the problem of the second-order serial correlation. Thus, we use the Arellano and Bond (1991) AR (2) test to check the presence of serial correlation in the residuals.

4. Empirical Findings

4.1 Monetary Policy and Banks' Credit Supply: Controlling for Bank Size and Liquidity

The estimation results of equations (1) and (3) are given in Table 1. The results of the diagnostic tests given in Panel B of the table provide strong evidence that the instruments used in the estimation are not correlated with the error term and the estimated residuals do not exhibit the second-order serial correlation in all the three estimated models. Thus, our estimation results are reliable.

In Panel A of Table 2, KIBOR is negatively and significantly related to the credit supply of both small-sized and large-sized banks in Pakistan. This finding implies that banks reduce their financing on average during periods of monetary tightening, regardless of their size. Said differently, a tightening in MP, by raising interest rates, has an adverse effect on the credit expansion of both small- and large-sized banks operating in Pakistan during the examined period. It may also imply that the clients reduce banks' financing as it becomes more expensive. However, the estimated values of coefficient suggest that the adverse effect of the increased interest rate on the financing decisions of small-sized banks is higher as compared to large-sized banks. This means that during periods of tight MP, small-sized banks reduce their financing more than their large-sized counterparts do.

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[3] Lately, IBs in Pakistan have also initiated remunerative Current Accounts based on *muḍārabah* (SBP, IB Bulletin Apr-June, 2019), but a little weightage is given to such deposits and only small return is allocated to them that commensurate the benefits/facilities given to such Business account holders.

Table 2: Impact of Monetary Policy on Credit Supply of Banks - Bank Size and Liquidity

Panel A: Estimation Results

Variables	Model 1 Coefficient	SE	Model 2 Coefficient	SE
Lagged Credit Supply	0.691***	0.107	0.668***	0.121
Bank Size	0.035***	0.011	0.028**	0.012
Bank Liquidity	0.791**	0.178	0.108***	0.016
Bank Capital	0.007**	0.003	0.042	0.342
Coverage Ratio	0.081*	0.046	0.147**	0.067
Credit Risk	-0.683***	0.135	-0.977***	0.230
Bank Profitability	0.020***	0.006	0.022***	0.006
Debt to Equity Ratio	0.005	0.011	0.010*	0.005
KIBOR $\times D^{Small}$	-0.104***	0.016		
KIBOR $\times D^{Large}$	-0.074***	0.018		
KIBOR $\times D^{Less}$			-0.007***	0.001
KIBOR $\times D^{More}$			-0.003**	0.001
GDP Growth	0.045 ***	0.009	0.011*	0.006
Inflation	0.024**	0.011	0.024*	0.013
Constants	0.811***	0.277	0.486*	0.295

Panel B: Diagnostic Tests

No. of Observations	194	194
No. of Banks	27	27
No. of Instruments	39	31
AR (2)	1.49	1.56
p-value	0.419	0.119
J- statistic	15.38	13.62
p-value	0.950	0.754

Notes: The *J*-statistic is the test for over identified restrictions to ensure the validity of the instruments and distributed as chi-squared under the null of instrument validity and the Arellano-Bond AR (2) test is to observe the second-order serial correlation in the residuals. The instruments for both are the two to third lags.
*** p<0.01, ** p<0.05, * p<0.1

Specifically, the estimated value of the coefficient implies that small-sized banks decreased their financing, as a percentage of total assets, by 10.4%, on average, whereas, large-sized banks reduces financing by only 7.4% in response to a one per cent increase in the KIBOR. This finding suggests that when the State Bank of Pakistan tightens the MP by rising interest rates, banks face difficulties and cut back their financing. During periods of monetary contractions, banks may have limited financing. This is because the central bank drains reserves out of the banking system, and so, it reduces the monetary base of the banks. As a result, banks become unable to offer more financing and hence, reduce their credit supply. The results indicate that the banks that are small in size are affected more. The empirical evidence on the negative impact of increase in KIBOR on bank credit expansion supports the presence of a bank-centric view of MP transmission mechanism in the banks of Pakistan. The findings suggest that the investors and managers of small-sized banks should be more cautious during episodes of tight MP as small-sized banks are affected more by adverse MP shocks. The empirical results given in Table 2 are in favour of the bank-centric view of MP

(Kashyab & Stein, 1994). Similarly, these results are in accordance with the existing literature, such as Sharpe (1995), Hasin and Majid (2012), Janjua, Rashid, and Qurrat-ul-Ain (2014), and Zaheer, Ongena, and Wijnbergen (2013).

Looking at the estimated coefficients of bank-specific variables we find that in Model 1 of Table 2, a one-period lag of the depended variable is significantly and positively related to the financing decisions of banks. This finding implies that the banks that offer more credit previously continue to supply more credit in the current period. This finding also provides evidence of the presence of inertia in banks' credit supply. Further, the positive and significant coefficient of the lagged dependent variable not only confirms the dynamic nature of the credit supply model, but also indicates a significant convergence in the long run. However, the estimated magnitude of the coefficient of the lagged credit supply presented in the table suggests that banks adjust their credit supply towards the long-run equilibrium with a speed of about 31% per year.

Inspecting the coefficient of the bank size variable, we find that banks' credit supply increases significantly with an increase in bank size. This finding suggests that larger banks may do more financing to harvest the benefits of economies of scale. Larger banks are generally financially sound and face less financial distress, and so, offer more financing. This result is also consistent with several previous empirical studies that have reported the positive relationship between bank size and the credit supply of banks (Alper, Hulagu, & Keles, 2012; Köhler, Hommel, & Grote, 2006; Schmitz, 2004). However, one should note that this result is contrary to the findings of Pruteanu-Podpiera (2007) and Janjua, Rashid, and Qurrat-ul-Ain (2014) that indicate a negative association between bank size and the credit supply decisions of CBs.

The coefficient of bank liquidity is positive and appears statistically significant, suggesting that banks' liquidity is positively related to the credit supply of banks. One possible explanation of the positive effect of bank liquidity is that banks operating in Pakistan may hold less cash & equivalent securities in their tills and do aggressively profitable investments in the real sector of the economy. Consistent with our findings on the bank liquidity effect, some prior studies such as Schmitz (2004) and Hasin and Majid (2012) also found evidence of a positive and significant influence of bank liquidity on the loan growth of CBs. However, some other studies like Janjua, Rashid, and Qurrat-ul-Ain (2014), Alper, Hulagu, and Keles (2012), and Köhler, Hommel, and Grote (2006) have documented a negative and significant relationship between liquidity and banks' loan supply decisions.

The estimation results also reveal that both the bank capital and coverage ratio variables are positively and significantly related to banks' credit expansion decisions. Specifically, we observe that the coefficient of bank capital is statistically significant with a value of 0.007, indicating that banks increase their supply of credit with bank capital. This result implies that banks that have better capitalization are expected to issue more credit. Several studies in the literature such as Girardin and Moussa (2011), Schmitz (2004), and Bernanke, Lown, and Friedman (1991) have also found a positive association between bank capital and the credit supply of banks. Further, our finding on the positive impact of bank capital supports the

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prediction of monetarists that well-capitalized banks survive more in periods of contractions of MP and offer more financing.

The coefficient of the coverage ratio is positive and appears statistically significant at the acceptable level of significance in two out of three estimated models, suggesting that banks with higher earnings before taxes relative to rent paid to participants increase their supply of credit. Consistent with our findings, Kaleem and Isa (2006), Sanrego and Nikmawati (2010), and Alaro and Hakeem (2011) have also documented the positive relationship between the coverage ratio and banks' credit supply. Nevertheless, this finding is inconsistent with Janjua, Rashid, and Qurrat-ul-Ain (2014), who found a negative and statistically insignificant effect of the coverage ratio on bank credit supply in the case of CBs in Pakistan.

The coefficient of credit risk is negative and has a value of -0.683. It is also statistically significant at an acceptable level. This finding implies that when the credit risk of a bank increases, the bank becomes conscious in issuing new loans, and so, declines its financing. Another possible explanation of such a finding is that in periods when banks face more credit risk, they decrease their lending and may prefer to hold excess cash in their hands to get buffer against any insolvency in the future. This finding is consistent with Janjua, Rashid, and Qurrat-ul-Ain (2014) and Pruteanu-Podpiera (2007), who have also reported the negative impact on bank credit expansion of the increased credit risk.

Another variable that is positively and significantly related to credit supply is the profitability of banks. Specifically, the estimated value of the coefficient of bank profitability, which lies in the range of 0.18 to 0.23 (see Tables 2 and 3), suggests that the higher the profitability of the bank the higher the credit supply of the bank. This finding makes sense as more profitable banks may have more internally generated funds and thus, they may issue more credits to their clients.

The variable related to the capital structure of banks, namely, the debt to equity ratio, appears to affect banks' credit supply positively, but statistically insignificantly. This finding implies that banks having more debt relative to equity in the composition of the structure of their assets are expected to supply more credit to their customers; but this relationship is statistically weak. This finding is consistent with the finding of Janjua, Rashid, and Qurrat-ul-Ain (2014). The last but not the least, the estimated coefficients of the variable GPD growth and the rate of inflation are positive and both appear statistically significant at any acceptable level of significance. Following the existing literature on bank credit supply we use the growth of GDP as a proxy for demand for loanable funds. Thus, the positive effect of GDP growth on bank credit supply suggests that banks are likely to do more financing during periods when economic growth (demand for loanable funds) is higher. During periods of high economic growth, since banks may face less financial distress and since both consumers and business firms may be willing to pay higher returns, banks expand their both investment and consumer financing. Further, in periods of good macroeconomic conditions, investment projects may yield relatively higher returns motivating banks to supply more credits. The results also suggest that banks increase their credit supply in episodes of higher inflation. The positive relationship between the rate of inflation and the credit supply decisions of banks

may also be rationalized. During periods of higher inflation, since business firms may earn higher profits and since flourishing firms may easily accept banks' terms and conditions to get financing, banks' credit supply increases.

After having provided strong evidence of the existence of the credit channel for both large-sized and small-sized banks, we study the response of less-liquid and more-liquid banks. To do so, we estimate the interacted model given in equation (3), where we multiply the dummy of a bank's liquidity position (low and high) with the underlying MP indicator. The estimation of this regression model enables us to examine the effects of tight MP on the credit supply decisions of less- and more-liquid banks. The results are given in Table 2 under Model 2 heading. Panel B of the table shows the results of the diagnostics tests. The estimated value of the j-test and the AR (2) test do not provide any significant evidence of the correlation between the instruments and the error term, and of the presence of the second-order serial correlation in the estimated residuals. Further, the results given in the table indicate that the effects of the lagged depended variable, bank-specific control variables, and macroeconomic variables are generally similar, both in terms of sign and statistical significance, to those presented in Model 1. Therefore, to save space, we do not do commentary on these results. Rather, we focus on the results of the variable of interest: the interaction terms between low- and high-liquidity and MP measures.

The results indicate that the MP measure is significantly and negatively related to the credit supply decisions of both less- and more-liquid banks. However, the results show that banks having a poor liquidity position are likely to be affected more by MP tightening than the banks with a higher level of liquidity. Put differently, although the banks of Pakistan, both low and high liquid, decrease their credit supply in periods of tight MP, low-liquid banks do so more destructively.

The estimated value of the coefficient implies that less-liquid banks decrease their financing, as a percentage of total assets, by 0.7%, on average, whereas, more-liquid banks cut their financing by 0.3% in response of a 1% increase in the KIBOR. These findings suggest that banks' liquidity position plays a vital role in establishing the credit channel of the MP transmission mechanism in Pakistan. These findings suggest that banks having more liquidity may easily adjust the monetary tightening by using their liquid assets as a buffer against any adverse MP shocks and thus, the credit supply of such banks exhibits less sensitivity to the increased interest rate. Another possible explanation for more-liquid banks being less affected by the tight MP is that banks having more liquidity rely less on external sources of financing. Consequently, they may cut less their financing to their customers in episodes of tight MP. On the other hand, banks with a poor liquidity position face financial distress and the cost of this financial distress is likely to be increased during periods of monetary tightening. Thus, they have to cut their financing by a higher amount as a result of the increased market interest rate.

This evidence is in line with the findings of Kashyab and Stein (1994, 1995, 2000), Schmitz (2004), Hasin and Majid (2012), Santis and Surico (2013), and Malede (2014). As in Santis and Surico (2013), an excessive cost of capital is a big problem for small, less liquid, and less capitalized banks. In this context, less-liquid banks are likely affected more by the

tightening of MP. Similarly, Köhler, Hommel, and Grote (2006) found the existence of the bank-lending channel in the Baltic region through banks' capital and liquidity position. They showed that more liquid and more capitalized banks react less intensely to monetary contractions than the banks with a poor liquidity position and less capital. Similarly, Schmitz (2004) and Hasin and Majid (2012) found that liquid banks adjust the tightening of MP, whereas, the banks with a poor liquidity position respond aggressively to MP actions.

4.2 Monetary Policy and Banks' Credit Supply: Controlling for Bank Type, Bank Size, and Bank Liquidity Position

In the previous subsection, we have presented strong evidence of the influence of MP tightening on banks' credit supply decisions. We have also reported that the effects of tight MP on the credit supply decisions of small-sized banks and the banks with less liquid assets are higher than their other counterparts. In this subsection, we present another set of results to examine whether the banking type, Islamic *versus* conventional, matters in establishing the impacts of monetary tightening. Specifically, to examine the effects of tight MP on the credit supply expansion of banks across bank types and bank size, we run the regression models given in equations (2) and (4). The estimation results are given in Table 3. Panel A and Panel B of the table present the estimation results and the diagnostic tests, respectively.

The results of the diagnostic tests provide strong evidence of the orthogonality of the instruments and the absence of the second-order serial correlation in the estimated residuals. The results of the bank-specific variables and macroeconomic variables are consistent with those given in Table 2. Therefore, to economize on space, we suppress discussion of these results here and emphasize only on the results of the monetary measures. By using indicators, we first divide the full sample of banks into IBs and CBs and then under each category, the banks are further divided into small-sized banks and large-sized banks as well as less-liquid banks and more-liquid banks.

Specifically, we interchange the four generated dummies with the MP instrument.[4] The estimated values of the coefficient of four interaction terms provide very fascinating information in both estimated models. The coefficient of the monetary measure for small-sized IBs is negative and has a value of -0.020, whereas, the corresponding value for large-sized IBs is -0.023. These magnitudes suggest that although all IBs decrease their financing during episodes of tight MP, the tight monetary effects are higher for small-sized IBs. Put differently, compared to large-sized IBs, small-sized IBs decrease their financing by a higher rate when the interest rate increases in the economy. These findings provide strong evidence of the presence of the credit channel of IBs in Pakistan. Further, these findings suggest that the sensitivity of credit supply to the MP tightening is higher for small-sized IBs than that for large-sized IBs.

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[4] Two dummies for bank size (small *versus* large) and two dummies for banking type (Islamic *versus* conventional) in Model 1. In Model 2, we replace size dummy with liquidity dummy.

Table 3: Impact of Monetary Policy on Credit Supply of IBs and CBs based on Bank Size and Liquidity

Panel A: Estimation Results				
	Model 1		**Model 2**	
Variables	**Coefficient**	**SE**	**Coefficient**	**SE**
Lagged Credit Supply	0.428***	0.101	0.389***	0.072
Bank Size	0.077***	0.022	0.076***	0.022
Bank Liquidity	0.732**	0.361	0.119***	0.040
Bank Capital	0.004**	0.002	0.005***	0.001
Coverage Ratio	0.010**	0.005	0.014**	0.006
Credit Risk	-0.335**	0.142	-0.402**	0.158
Bank Profitability	0.018***	0.003	0.023***	0.004
Debt to Equity Ratio	0.003	0.002	-0.024	0.022
KIBOR $\times D^{SIB}$	-0.020***	0.004		
KIBOR $\times D^{LIB}$	-0.023***	0.008		
KIBOR $\times D^{SCB}$	-0.036***	0.008		
KIBOR $\times D^{LCB}$	-0.032***	0.007		
KIBOR $\times D^{LLIB}$			-0.019***	0.006
KIBOR $\times D^{MLIB}$			-0.016***	0.005
KIBOR $\times D^{LLCB}$			-0.033***	0.008
KIBOR $\times D^{MLCB}$			-0.029***	0.008
GDP Growth	0.175 ***	0.067	0.210***	0.033
Inflation	0.016	0.016	0.017	0.012
Constants	0.588***	0.229	0.706***	0.115
Panel B: Diagnostic Tests				
No. of Observations	248		248	
No. of Banks	27		27	
No. of Instruments	31		30	
AR (2)	0.54		0.20	
p-value	0.592		0.843	
J- statistic	9.27		12.60	
p-value	0.902		0.633	

Notes: The *J*-statistic is the test for over identified restrictions to ensure the validity of the instruments and distributed as chi-squared under the null of instrument validity and the Arellano-Bond AR (2) test is to observe the second-order serial correlation in the residuals. The instruments for both are the two to third lags.
*** p<0.01, ** p<0.05, * p<0.1

Turning to the results for CBs, we find that the estimated values of the coefficient of monetary measures are negative and significant for both size categories. However, we observe that similar to the case of IBs, small-sized CBs are affected more by the tightening of MP as compared to large-sized CBs. The coefficient of the monetary measure for small-sized CBs is -0.036, whereas, the corresponding value for large-sized CBs is -0.032. These values provide strong evidence of the existing of the credit channel for CBs. Further, these findings suggest that the effects of tight MP on the credit supply decisions of CBs differ across small- and large-sized banks. In other words, the results reveal that during periods of MP tightening,

although both categories of CBs reduce their credit supply, small-sized CBs decline their credit supply by a higher amount.

By doing a comparison of the response of IBs and CBs to the tightening of MP we observe several noticeable aspects. The estimated magnitudes of the coefficient of the monetary measure indicate that the sensitivity of the credit supply of small- and large-sized IBs to the MP tightening is lower than that of their small- and large-sized conventional counterpart banks, respectively. Specifically, we find that compared to small-sized CBs, small-sized IBs are affected less adversely by the tight MP. For instance, when the interbank offered rate increases by 1%, small-sized IBs decrease their financing by 1.9%, whereas, small-sized CBs decrease their credit supply by 3.6%.

Similarly, the results show that compared to large-sized CBs, large-sized IBs cut back the financing by a smaller amount in periods of tight MP. Specifically, based on the estimated size of the coefficient, large CBs decrease their credit supply by 3.2%, whereas, large-sized IBs reduce their financing by 2.3% in response to a 1% increase in the KIBOR. These findings provide strong evidence on the different sensitivity of credit supply of IBs and CBs to MP. It is also evident from the results given in Table 3 that the effectiveness of the credit channel of the MP transmission mechanism considerably depends on both the nature of the banking (Islamic and conventional) and the size categories of banks (small and large). Finally, the results in the table suggest that there are substantial variations of the tight MP effects on credit supply decisions of banks across small and large size categories, both within IBs and CBs and as between IBs and CBs.

After having found the different response of both less- and more-liquid banks to the MP tightening (see Model 2 of Table 2), we present another set of results in Table 3 in column with heading Model 2 to examine whether the role of banks' liquidity position remains robust in establishing the credit channel at both IBs and CBs. We estimate equation (4) where we consider the types of banks (Islamic and conventional) over and above the banks' liquidity position (less and more liquid). Similar to our other estimations, based on the estimated statistics of the diagnostic tests, we conclude that our instruments are orthogonal to the error term and the residuals do not demonstrate any pattern of serial correlation.

The results of the lagged dependent variable, bank-specific variables, and macroeconomic variables are quite similar to our early findings on these variables given in the previous table. Specifically, we find that the lagged value of credit supply is positively and significantly related to the current credit supply, indicating the presence of strong persistence in the credit supply decisions of banks in Pakistan. We also find that bank size, bank capital, bank profitability, the coverage ratio, bank liquidity, and the debt-equity ratio all are positively and significantly related, whereas, credit risk is negatively and significantly related to the credit supply decisions of banks. Likewise, the results regarding the macroeconomic variables show that both GDP growth and the rate of inflation have a positive impact on banks' credit supply. Yet, the estimated coefficient of inflation appears statistically insignificant.

By using categorical variables, we first classify the full sample of banks into IBs and CBs and then under each type, we further split the banks into less- and more-liquid banks based on their liquidity position. Specifically, we interchange the four-constructed dummies (two for IBs and two for CBs) with the MP instrument. The results of the interaction terms provide worthwhile evidence. The coefficient of the monetary measure for less-liquid IBs is -0.019, whereas, the corresponding value for more-liquid IBs is -0.016. All of these estimated values are significant at an acceptable level of significance. Thus, they provide strong evidence that though all IBs are likely to cut their financing during monetary contractions periods, the effects of tight MP are considerably higher for those IBs that have less liquid assets, on average. Said differently, compared to more-liquid IBs, the financing of less-liquid IBs declines by a higher amount when the monetary authorities increase interest rate in the economy. These findings provide strong evidence of the presence of the credit channel of IBs in Pakistan, regardless of their liquidity position. Yet, these findings also demonstrate that the sensitivity of credit supply to the MP tightening is higher for less-liquid IBs in comparison to more-liquid IBs.

Looking at the estimated values of the interaction terms for CBs, we observe that the estimates of the coefficient of the monetary measure are negative and statistically significant for both liquidity categories. However, we find that similar to the case of IBs, less-liquid CBs are affected more by the tightening of MP as compared to more-liquid CBs. Specifically, the results indicate that the coefficient of the monetary measure for less-liquid CBs is -0.033, whereas, the corresponding value for more-liquid CBs is -0.029. These values provide strong evidence of the existence of credit channel for CBs, regardless of their liquidity position. Further, these findings suggest that the effects of tight MP on the credit supply decisions of CBs differ across less- and more-liquid banks. In other words, the results reveal that during periods of monetary constrictions, although both categories of CBs reduce their credit supply, less-liquid CBs do so by higher amount.

Comparing the sensitivity of the credit supply decisions of both IBs and CBs to monetary contractions across their liquidity position, we observe several manifest aspects. Both liquidity categories of IBs respond less to monetary contractions than their less- and more-liquid conventional counterparts. Specifically, the results demonstrate that compared to less-liquid CBs, less-liquid IBs are affected less adversely by the tight MP. For instance, when the interbank offered rate increases by 1%, less-liquid IBs decrease their financing by 1.9%, whereas, less-liquid CBs decrease their credit supply by 3.3% of total assets. Similarly, the estimation results show that compared to more-liquid CBs, more-liquid IBs cut back the financing by a smaller amount in periods of tight MP. Specifically, taking the estimated coefficients at their face value, we find that more-liquid CBs decrease their credit supply by 2.9%, whereas, more-liquid IBs reduce their financing by only 1.6% of total assets in response to a 1% increase in the KIBOR in the economy.

These findings provide strong evidence on the different sensitivity of the credit supply of IBs and CBs even after controlling for their liquidity position. It is also evident from the results given in Table 3 that the effectiveness of the credit channel of the MP transmission mechanism considerably depends on both the nature of the banking (Islamic and

conventional) and the liquidity position of banks (low and high). Finally, our findings strongly demonstrate that there are considerable disparities in the effects of monetary contractions on financing decisions of banks across liquidity positions, both within IBs and CBs and as between IBs and CBs. Specifically, we find that the increased interest rate has a less negative impact on more liquid banks. These results suggest that the credit supply of both IBs and CBs responds less to the tight MP when banks have more liquid assets.

A possible explanation for such findings is that there are fundamental differences in contractual and motivational features of the Islamic banking and conventional banking systems. Moreover, Islamic finance is based upon asset-based and risk-sharing arrangements, whereas, conventional banking plays the role of financial intermediation through mainly the contracts, which are based upon loans and transfer of risk to clients. These features enable Islamic financial institutions to manage their depository investment accounts on the *muḍārabah* arrangement, where credit risk doesn't transfer from depositors to IBs (Sukmana and Kasim, 2010).

This finding also suggests that although the structure of IBs is quite different from that of CBs, any monetary tightening by the SPB in terms of increasing interest rate would have an adverse impact on the credit supply decisions of IBs. One of the possible explanations for such finding is that in spite of IBs doing interest-free and Sharīʿah compliant financings/investments, they share the same interbank mark and work under the same laws and regulations governing their conventional counterparts. Thus, it is expected that increased interest rates negatively affect IBs' credit supply. The presence of the bank-centric view in the case of IBs suggests that while devising MP instruments to achieve the macroeconomic objective of MP, the authorities should also take into account IBs along with CBs. Finally, the finding of the negative effects of tight MP on IBs' credit supply is consistent with several prior studies in the literature that have documented the same effect for CBs (see, for instance, among several others, Kashyab and Stein, 1994; Sharpe, 1995; Hasin and Majid, 2012; Janjua, Rashid, & Qurrat-ul-Ain, 2014).

In sum, the results of the paper reveal that the monetary tightening has a significant influence on the credit supply decisions of both IBs and CBs. These findings imply that the credit channel of the MP transmission mechanism exists at both IBs and CBs. However, it is relatively less effective in the case of IBs. The findings also suggest that the size of a bank and its liquidity position both have an essential role to play for the effectiveness of the credit channel. Finally, we show that the effects of tight MP on banks' financing decisions are robust to the inclusion of several bank-specific and macroeconomic control variables in the specification.

5. Conclusions

The bank credit channel of MP has recently received increased attention from both the researchers and the policymakers. In fact, we have a vast body of literature on the effects of MP on the credit supply decisions of CBs. Yet, we know less about the behaviour of IBs during periods of monetary tightening. In this paper, we first examine the existence of bank-

centric view of MPTM by quantifying the impact of KIBOR on the credit supply of banks in Pakistan after taking into account their size based on total assets and their liquid positions based on their holdings of cash and equivalent assets. After having found the strong empirical evidence in favour of the credit channel in both size and liquidity categories, we further control for the nature of banking, Islamic and conventional. To carry out the empirical analysis, we use an unbalanced panel dataset of a large sample of commercial banks operating in Pakistan over the period 2005-2016. We apply the two-step system-GMM estimator, which effectively not only controls for the possibility of endogeneity, but also provides unbiased estimates in the presence of cross-section heteroskedasticity in the panels. Finally, our analytical framework enables us to compare directly the sensitivity of banks' credit supply decisions to monetary contractions across the nature of banking (Islamic *versus* conventional) and across different categories of banks based on bank size and bank liquidity positions.

The results of the paper are recapped as follows. First, we find strong evidence on the presence of the credit channel in Pakistani banks by showing that monetary contractions have significant, negative effects on the financing decisions of banks regardless of their size and liquidity positions. Nevertheless, our empirical analysis reveals that both bank size and liquidity positions have an important role to play in establishing the sensitivity of credit supply to the MP tightening. Second, although both IBs and CBs reduce their financing in periods of monetary contractions, the response of IBs is weaker than that of their conventional counterparts. Third, we find that large-sized and more-liquid IBs as well as CBs respond less to the MP tightening as compared to their small-sized and less-liquid IBs and conventional counterparts, respectively. Taken together, the results of the paper provide significant evidence showing that there are considerable differences in the influence of the MP tightening on the credit supply decisions of banks of Pakistan across bank size and liquidity positions, both within as well as between IBs and CBs.

Policy Implications

Several policy implications are emerging from the results of this paper for both MP authorities and the bank managers. First, the central bank of Pakistan can use the interbank offered rates as a policy instrument to effectively manage credit supply in the economy as we present strong evidence on the existence of the credit channel of the MP transmission mechanism. Since, during periods of monetary contractions, the financing of banks is affected negatively, banks should smooth their earnings and anchor themself to financial solvency by investing more in real economic activities and depending more on internally generated funds, rather than deposits and external borrowings.

Second, based on our findings we suggest that for an effective MP, there is a vital need to consider the unique nature of IBs while devising the instruments to manage credit supply in the economy, as we show IBs are affected less during episodes of monetary tightening. Otherwise, there may appear puzzles to MP actions and it may become ineffective to efficiently achieve macroeconomic objectives of the policy. Third, we caution that the passive response of IBs, large, and more liquid banks to tight MP in Pakistan may make it difficult for the SBP to achieve the desired objectives of the MP.

Fourth, the policymakers should take into account the size and liquidity position of banks while formulating any policy regarding the market interest rate because we show that small-sized and less-liquid banks are affected more as compared to their large-sized and more-liquid counterparts. Lack of adequate monetary instruments will lead to high intermediation costs and persistent inflationary pressures. This study suggests policymakers to consider Islamic financing as a complement channel to monetary policy transmission mechanism because we find strong evidence of the presence of IBs' credit channel over and above CBs' credit channel in Pakistan. The results of the paper on the monetary policy transmission mechanism may be generalized to other countries having a dual banking system and similar economic and financial markets structures.

Last but not least, the findings we present here should be an eye-opening experience to the adherents of Islamic finance and banking. This is because they unveil the fact that despite having different structure in principle, IBs' financing is highly adversely influenced owing to the increased market interest rate in the economy. This piece of evidence indicates that, rather than doing socially responsible and sustainable investment on economic-based rates of return, IBs largely rely on fixed rate-based investing, which is highly affected by any adjustment in the market interest rate by the central bank. Further, they may often use KIBOR rates as a benchmark for determining their profits and thus, any change in market rates negatively impacts the financing of IBs. For instance, the pricing in the products like running *mushārakah*, *salam*, *murābaḥah* to purchase orderer, and *ijārah* are highly based on KIBOR in Pakistan (Siddiqi, 2006; SBP, 2009; Shaikh, 2013; Ghauri, 2015; Siddique, 2017). One of the possible alternatives of avoiding the KIBOR consideration is that the benchmark rate for each offering should be based on productivity and economic growth rate, the nature of the underlying offering, the associated risks on the one side, and on the other, the benchmark rate should be in line with Sharīʿah principles.

Future Research Agenda

This paper provided strong evidence on the presence of the credit channel of MP by examining the effects of the monetary policy rate (KIBOR) on Islamic and conventional banks' financing decisions. The research can be further extended by using other types of interest rates such as lending rates, the deposit rate, the spread between bond yields, etc. The paper considered the role of bank size and liquidity position in formulating the effects of MP on the credit supply decisions of banks. However, one can examine the differential effects of MP by considering other bank-specific characteristics such as bank profitability, bank capital, credit risk, etc. It would be also worth exploring the MP effects on banks' deposits, total assets, and their financial health. Finally, from both bank managers' and policymakers' viewpoint, examination of spillover effects of the MP of foreign countries such as the USA and the UK on domestic Islamic and conventional banks' financing decisions would be worthwhile.

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