*Jurnal Ekonomi Malaysia 56(2) 2022 129 - 140*
*http://dx.doi.org/10.17576/JEM-2022-5602-9*

# The Transmission Mechanism of Monetary Policy *via* Bank' Balance Sheet: An Empirical Study of Dual Banking System in Pakistan

## *(Mekanisme Penghantaran Polisi Monetari melalui Kunci Kira-kira Bank: Kajian Empirikal Sistem Perbankan Dwi di Pakistan)*

**Anis Kabir**
Pakistan Institute of Development Economics (PIDE)
**Syed Muhammad Abdul Rehman Shah**
University of Engineering and Technology (UET) Taxila
**M. Kabir Hassan**
University of New Orleans
**Muhammad Akmal**
MCB Islamic Bank Limited Pakistan

*ABSTRACT*

*This study empirically analyzes the MPTM through bank' balance sheet in Pakistan for the period of 2008-2018. The data set consists of 22 conventional banks and 18 Islamic banks (5 full-fledged and 13 Islamic windows of conventional banks) of Pakistan. The study employs the robust two-step system-Generalized Method of Moments is applied for estimation and confirms the presence of balance sheet channel in Pakistan. The study also finds that responses of Islamic banking operations to monetary policy shocks are not different from their conventional peers because both banking systems use Karachi Interbank offered rate (KIBOR) as a benchmark for their products. The results also highlight the sensitivity of banking operations (conventional vs Islamic) to monetary policy shocks are quite different, mainly due to the difference in their nature of contracts. This study is equally beneficial for academicians and practitioners to consider the nature of both banking systems in same economy. Our findings indicate that, policy makers need to consider the nature of both banking system (conventional vs Islamic) to maintain deposits and credit supply in an economy.*

*Keywords: Monetary policy; balance sheet channel; Islamic banks; conventional banks; monetary policy transmission mechanism.*
*JEL: E52, E42, G21, E44, O16*

*ABSTRAK*

*Kajian ini secara empirikal menganalisis MPTM melalui kunci kira-kira bank di Pakistan untuk tempoh 2008-2018. Set data terdiri daripada 22 bank konvensional dan 18 bank Islam (5 bank penuh dan 13 bank jendela Islamik) Pakistan. Kajian ini menggunakan Kaedah Momen Teritlak-sistem langkah dua untuk membuat anggaran dan mengesahkan kehadiran saluran kunci kira-kira di Pakistan. Kajian itu juga mendapati bahawa tindak balas operasi perbankan Islam terhadap kejutan dasar monetari tidak berbeza dengan rakan konvensional mereka kerana kedua-dua sistem perbankan menggunakan kadar tawaran Karachi Interbank (KIBOR) sebagai penanda aras untuk produk mereka. Hasilnya juga menyerlahkan sensitiviti operasi perbankan (konvensional vs Islam) kepada kejutan dasar monetari agak berbeza, terutamanya disebabkan oleh perbezaan sifat kontrak mereka. Kajian ini juga memberi manfaat kepada ahli akademik dan pengamal perbankan untuk mempertimbangkan sifat kedua-dua sistem perbankan dalam ekonomi yang sama. Penemuan kami menunjukkan bahawa, pembuat dasar perlu mempertimbangkan sifat kedua-dua sistem perbankan (konvensional vs Islam) untuk mengekalkan deposit dan bekalan kredit dalam ekonomi.*

*Kata kunci: Dasar monetari; saluran kunci kira-kira; bank Islam; bank konvensional; mekanisme penghantaran dasar monetari.*

*Received 30 June 2022; Revised 25 September 2022; Accepted 12 October 2022; Available online 30 October 2022*

## INTRODUCTION

Monetary policy (MP) of a central bank intends to meet economy's desired objectives *i.e.,* economic growth, maintaining the price stability, full employment, and stability in exchange rate. The conventional view of MP indicates that money supply is the main instrument to achieve these objectives as it provides a link between MP framework and aggregate output of the economy (Friedman & Schwartz 1963; King & Plosser 1984; Sims 1992; Kim et al. 2021). However, the new theories of MP underline the importance of banks in monetary policy transmission mechanism (MPTM) (Kashyap & Stein 1994; Bernanke & Gertler 1995). The effectiveness of banks in the process of MPTM mainly depends on three aspects: (1) the extent to which banks depend on their deposits, (2) the sensitivity of MP shocks to the credit expansion of the banks, (3) how much the consumers and investors depend on the borrowing of the banks.

In principle, to fine-tune the economy, MP can be transmitted to the real economy through variety of different transmission channels, including traditional interest rate channel also referred as "money view" of transmission mechanism, credit channel known as the "credit view" of MPTM. The credit channel further operates via two other channels in credit market "the bank lending channel" and "the balance sheet channel" (also termed as net worth channel) (Bernanke & Gertler 1995), asset price channel; the asset price channel affects the aggregate demand through further two channels; the Tobin's q theory of investment and the wealth effect on consumption and finally the exchange rate channel (Yemba et al. 2020). These channels generally vary from country to country and react differently depending on the range of factors including legal and financial structure of that particular country i.e., the size of financial institutions, depth and development of money and stock market, the structure of MP regime, comparative environment among financial institutions and the efficiency of economic system (Li et al. 2016).

Most of the existing literature has focused only on conventional banks while discussing the impact of MP on banking operations. The discussion about the role of MP in Islamic banks makes this study more important as it considers alternate banking model of Islamic banks and its role in MPTM. In the past two decades, Islamic banks emerged as an alternative of conventional banking system, particularly in the aftermath of global financial crisis of 2007-08 which is the most remarkable piece of evidence in favor of Islamic banking. Many countries like Pakistan, Indonesia, Malaysia, Turkey, Bahrain, KSA, Qatar, and UEA have dual banking economies, where Islamic banks operate alongside with conventional banks under the same monetary environment.

Indeed, Islamic banking system have unique characteristics i.e., prohibition of interest rate, profit and loss sharing (PLS) paradigm, risk sharing, and asset-based transactions (Choudhry & Mirakhor 1997; Shah & Rashid 2015; Shah et al. 2021). Despite of all these characteristics that make it standout from conventional banking system, Islamic banks in Pakistan cannot be considered immune to MP shocks (interest rate changes) faced by conventional banks even if the nature and structure of Islamic banking products are quite different from conventional banks because both conventional and Islamic banks are working under the same MP framework. Hence, any change in MP transmits its effect to the real sector via conventional as well as Islamic banks. However, due to the asset-based nature of Islamic banks, it is highly expected that the role of Islamic banks in MPTM is quite different (Nosheen & Rashid 2019; Shah et al. 2018). Thus, in the past two decades, it has been a subject of lively interest for many economists to seek the answer regarding the viability of transmission mechanism of MP in a dual banking system, especially, when both banking system have assorted products and instruments in the same economy. The study set the stage for discussion that how MPTM – the famous "black box"- works through bank' balance sheet and how it transmitted its effect to the real economy.

The main reason to choose Pakistan as a country of interest is because of the following characteristics; first, unlike to many other countries, Pakistan's economy is operating under the dual banking system where both banking system (conventional vs Islamic) operates under the same monetary environment. Secondly, the industrial sector in Pakistan is completely bank dependent and that motivates the researchers to investigate the role of banks in MPTM and thirdly, the Islamic banking in Pakistan is continuously growing and it provides shariah compliance investment projects in both capital and money market. Therefore, it is important to analyze the impact of MP shocks on balance sheet of Islamic banks.

Although, in recent past, many studies have analyzed the role of banks in MPTM. However, the current study distinguish itself from the existing literature of MPTM due to some unique characteristics; firstly, the study used bank level data to analyze the response of MP shocks to Islamic and conventional banks armed with specific and detailed bank-level data. Secondly, the study considered both banking systems i.e., conventional *versus* Islamic banks to examine the balance sheet channel of MPTM by using the bank-level data. Whereas the majority of the previous studies have addressed this issue by considering only the conventional banks (Kashyap & Stein 1994) Thirdly, the study considered both asset (financing) and liability (deposit) side of balance sheet, whereas the previous studies discussed this issue by considering only asset side of balance sheet (Janjua et al. 2014).

The study analyzed the role of banks in MPTM by examining the impact of MP on bank' balance sheet. The study finds the strong empirical evidence about the role of banks in MPTM in Pakistan. It also shows that the response of conventional banks to MP shocks is stronger than Islamic counterparts. The results of the study also find that the sensitivity of banking operations (conventional *vs* Islamic) to monetary policy shocks are quite different, mainly due to the difference in their nature of contracts. The findings of the study also confirm the presence of balance sheet channel for both conventional and Islamic banks in Pakistan as the operations (bank deposits and bank financing) of both types of banking systems, are sensitive to MP shocks.

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.

## LITERATURE REVIEW

The review of the pertinent literature about the impact of MP on bank' balance sheet can be classified into following strands: interest rate and conventional bank deposits, interest rate and Islamic bank deposits, interest rate and conventional bank financing, interest rate and Islamic bank financing. A brief review of each strand is discussed underneath.

### IMPACT OF INTEREST RATE ON CONVENTIONAL BANK DEPOSITS

Over the past few decades, there has been a notable number of studies in the literature taking into consideration the role of financial institutions in MPTM more precisely banks (Bernanke & Blinder 1988; Bernanke & Gertler 1990; Kashyap & Stein 1994; Kashyap & Stein 2000; Kishan & Opiela 2000). Generally, in conventional banking system, deposits (liability side of bank balance sheet), which can alternatively be considered as savings, is believed to be influenced by certain MP and macroeconomic measures. This notion has been statistically testified for various economies during the last two decades (Loayza & Shankar 2000; Athukorala & Sen 2004; Ergec & Arslan 2013; Ostadi & Sarlak 2014; Ojeaga & Odejimi 2013; Mashamba et al. 2014; Mushtaq & Siddique 2017, Efendic et al. 2019).

A study conducted by Raza et al. (2017) in the context of Pakistan analyzed the effects of interest rate on bank's deposits. The study covered the period from 2002 to 2016 and analyzed the statistical hypothesis by using least square regression method. The outcomes of the study revealed that rate of interest has positive association with bank deposits in Pakistan.

### IMPACT OF INTEREST RATE ON ISLAMIC BANK DEPOSITS

In recent past, due to the rapid growth of Islamic banking, the viability of Islamic banking system has so long been one of the most discussed topics among researchers. Over the last two decades, an important and renowned set of authors and researchers inducted the pioneer contribution to the literature and provided many theoretical and empirical arguments regarding MP shocks (interest rate changes) and Islamic bank deposits (Haron & Ahmad 2000; Rachmawati & Syamsulhakim 2004; Kasri & Kassim 2009; Zainol & Kassim 2010; Sukmana & Kassim 2010; Affandi & Tamanni 2010; Abduh et al. 2011; Ergec & Arslan 2013; Hassan & Makinde 2016; Nazib & Masih 2017; Arshad & Nurfadilah 2017; Aysan et al. 2018).

By the same token, an important study conducted by Akhter et al. (2017) examined the association between some macroeconomic variables and bank deposits in Pakistan i.e., lending rate, price level, GDP, Karachi stock exchange index (KSE), money supply, interbank offer rate (KIBOR) and rate of return. The study covered the data from 2006 to 2011. The study provided the evidence that in dual banking system, the customers of both banking systems are influenced by the movement of interest rate.

### IMPACT OF INTEREST RATE ON CONVENTIONAL BANK FINANCING

In this strand, those studies have been considered that highlight the dynamic impact of interest rate on conventional bank financing. By using the interest rate, government manage the financing (Utama 2020). In this regard, many economists explored the relationship between interest rate and bank financing. Bernanke and Blinder (1988) are the first who introduced the new variable "credit" in the IS-LM framework and established a fact that a contractionary MP reduces the aggregate lending of the banks. It is also considered that the work of Bernanke and Blinder (1988) is the extension of "interest rate channel". Later, (Bernanke & Blinder 1992; Kashyap & Stein 1994; Kashyap & Stein 2000 and Kishan & Opiela 2000) confirmed the relationship between MP shocks (interest rate changes) and bank financing in USA. The study of Kashyap and Stein (1995) compared the role of small and large sized banks in contractionary MP. They found that during the contractionary MP period, small size banks reduce their financing as compared to large size banks.

Similarly, Amonoo et al. (2003), Gambacorta and Mistrulli (2004), Ibrahim (2006), Karim et al. (2006), Karim and Saini (2011), Olokoyo (2011), Imran and Nishat (2013), Aysun and Hepp (2013), Janjua et al. (2014), Borio and Gambacorta (2017), Ekimova et al. (2017), Naiborhu (2020), Hamid and Yunus (2020), Beutler et al. (2020) found the significant relationship

between interest rate and conventional bank financing. The abovementioned studies found how bank lending channel and balance sheet channel operate in these countries.

In the context of Pakistan, Agha et al. (2005) found the importance of banks to provide credit to private sector which ultimately effects the aggregate demand. Shabbir (2012) was the first who found the balance sheet channel by using the micro level data of firms. She found that a contractionary MP decreases the net worth of large firms. Similarly, Rahooja et al. 2014 found the existence of bank lending channel in Pakistan by using the time series data. Another study conducted by Janjua et al. (2014) also found the role of banks in transmission mechganism of MP through balance sheet channel in Pakistan. Contrary to these studies, Bashir and Zaman (2021) also found the ineffectiveness of credit channel in Pakistan.

### IMPACT OF INTEREST RATE ON ISLAMIC BANK FINANCING

The last strand of empirical literature simply focuses on the impact of interest rate on Islamic banks' financing. A study conducted by Halim and Masih (2017) analyzed that how the financing in Islamic banks reacts after the change in macroeconomic variables. They found the empirical result that the rate of interest has significant negative relationship with Islamic banks' financing. Furthermore, the contribution of Rosly (1999), Kaleem and Isa (2006), Kassim et al. (2009), Sukmana and Kassim (2010), Adebola et al. (2011), Zaheer et al. (2013), Zulkhibri (2018), Caporale et al. (2020), Seho et al. (2020), Radwan and Drissi (2020) and Rashid et al. (2020) also found the association between interest rate Islamic banks' financing.

Recently, an important work done by Shah and Rashid (2019) to analyze the impact of MP shocks on credit supply of Islamic banks. Authors selected Pakistan and Malaysia as a case study because both countries having dual banking setup. They addressed this issue by using the micro level data and found that there is a negative relationship between MP shocks and bank credit supply in Pakistan and Malaysia. Similarly, Rafay and Farid (2019) used the macro level data of Pakistan and also found that how MP shocks effects the credit decision of Islamic banks.

After the discussion of the abovementioned literature, we analyze the expected relationship between MP measures and bank deposits and financing. The literature suggests that MP variables are positively related to bank deposits and negatively related to bank financing.

## DATA AND METHODOLOGY

### DATA AND ITS SOURCES

The study incorporated secondary data on annual basis from 2008 to 2018 (11 years). The data of all selected macroeconomic variables are assembled from the official website of the State Bank of Pakistan (SBP) and the financial data that is used for estimation is collected from the Annual financial statements of all particular banks. The study utilizes the data of 22 conventional banks and 18 Islamic banks (5 full-fledged and 13 Islamic windows of Conventional banks) of Pakistan. The selection criteria of these 40 banks completely depend on the availability of the data.

TABLE 1. Description of Variables

| | Variables | Description | Sources |
|---|---|---|---|
| Dependent Variables | Conventional bank deposits | Log of total deposits of conventional banks | Financial Statements of Banks |
| | Islamic bank deposits | Log of total deposits of Islamic banks | Financial Statements of Banks |
| | Conventional bank financing | Ratio of gross loans to total assets of conventional banks | Financial Statements of Banks |
| | Islamic bank financing | Ratio of financing to total assets of Islamic banks | Financial Statements of Banks |
| Monetary Policy Measure Indicators | Karachi Interbank Offered Interest Rate | Interbank offered interest rate as an instrument of monetary policy | SBP |
| Bank-Specific Variables | Bank size | Log (total asset) | Financial Statements of Banks |
| | Liquidity | Cash and Cash Equivalent / Total Assets | Financial Statements of Banks |
| Macroeconomic Conditions | GDP Growth | $\frac{Y_t - Y_{t-1}}{Y_{t-1}} \times 100$ | SBP |
| | Inflation (CPI) | As reported by SBP | SBP |
| | Money Supply | currency in circulation + demand deposits with SBP + Total private and PSE deposits of which: RFCDs | SBP |

### MODEL SPECIFICATION

In this study we estimate four empirical models to investigate the impact of interest rates on deposits and financing of conventional and Islamic banks.

By following Kashyap and Stein (1994) and Rashid et al. (2020) we explore the relationship between balance sheet variables and MP measures in the following equation.

$$Y_{i,t} = \beta_i + X_{i,t}\alpha + Z_t\gamma + \rho M_t + \acute{\varepsilon}_{i,t} \quad (1)$$

$Y_{i,t}$ Dependent Variables
$X_{i,t}$ A set of bank specific variables
$Z_t$ A set of macroeconomic variables
$M_t$ Main explanatory variable (interest rate)
$\acute{\varepsilon}_{i,t}$ Error term

Where is the deposits and Financing with four alternatives: Conventional bank's deposits, Islamic bank's deposits, Conventional bank's financing, and Islamic bank's financing. Interbank offered interest rate (KIBOR) is our main explanatory variable. While bank specific variables i.e., bank size and bank liquidity and some macroeconomic variables i.e., GDP, money supply and CPI play their part as control variables. For analysis purposes, all the variables are converted into log form.

### ESTIMATION TECHNIQUE

GMM estimation method suggested by Arellano and Bover (1995) and Blundell and Bond (1998) add the lagged values of the explained factor as instruments to explain the endogeneity problem. Both system GMM and first-differenced GMM got a greater attention in the past literature. However, the first-differenced GMM method is not effective due to small sample size (Levine et al. 2000). Furthermore, Bond (2002) find out that if the estimators are biased because of non-stationary data, the system GMM can give higher accuracy in the estimation outcomes because a higher number of instruments are used in it, and it associates the regression in the levels with regressions in the first differences. Furthermore, it is comparatively better because when the time series has a random-walk process, the instruments will be efficient predictors for the endogenous factors in the level regression (Blundell & Bond 1998). Similarly, the use of system GMM estimation improves the accuracy of the model along with reducing the small sample bias. Janjua et al. (2014), Rashid et al. (2020) used the system GMM for small sample size and analyzed the impact of MP on bank balance sheet and credit supply.

A one period lagged value of the dependent variable is included in the model. In diagnostic testing, Hansen (1982) test is employed to test the null hypothesis that the used instruments are orthogonal to the residuals. Further, AR (2) test by Arellano and Bond (1991) is used to make sure that the estimated residuals have no 2nd order serial correlation problem.

## RESULTS AND DISCUSSIONS

This section provides empirical analysis of our results. First, we use summary statistic to explore the important aspects of data set.

### DESCRIPTIVE STATISTICS ANALYSIS

This section consists of descriptive statics of all variables related to study.

TABLE 2. Descriptive summary of the variables (Conventional Banks vs Islamic Banks)

| Variables | Obs | Mean | St.Dev | Min | Mix | Skew | Kurt |
|---|---|---|---|---|---|---|---|
| Deposit | 236 | 11.146 | .6838 | 9.276 | 12.329 | -.5583 | 2.648 |
| | (172) | (10.410) | (.7744) | (7.270) | (11.895) | (-.7084) | (4.847) |
| Financing | 236 | 10.876 | .6703 | 9.363 | 12.033 | -.5800 | 2.412 |
| | (172) | (10.118) | (.7468) | (8.146) | (11.709) | (-.00051) | (2.5611) |
| KIBOR | 236 | 10.536 | 3.038 | 6.44 | 16.11 | .1284 | 2.049 |
| | (172) | (10.244) | (2.986) | (6.44) | (16.11) | (.2036) | (2.0757) |
| GDP | 236 | 7.016 | .0562 | 6.942 | 7.118 | .3719 | 1.856 |
| | (172) | (7.024) | (.0567) | (6.942) | (7.118) | (.2030) | (1.7538) |
| CPI | 236 | 9.125 | 5.138 | 2.9 | 20.8 | .7422 | 2.909 |
| | (172) | (8.548) | (5.036) | (2.9) | (20.8) | (.8920) | (3.1618) |
| MS | 236 | 6.961 | .1705 | 6.680 | 7.219 | -.1163 | 1.791 |
| | (172) | (6.983) | (.1686) | (6.680) | (7.219) | (-.2762) | (1.8727) |
| BS | 236 | 11.298 | .6430 | 9.724 | 12.480 | -.4577 | 2.509 |
| | (172) | (10.537) | (.6700) | (8.948) | (12.002) | (.1223) | (2.672) |
| Liquidity | 236 | .0870 | .0455 | .0309 | .3222 | 2.760 | 12.156 |
| | (172) | (.1025) | (.0671) | (.0070) | (.3783) | (1.5314) | (5.960) |

*Note:* Figures in parenthesis represent descriptive statistics of Islamic banks

Table 2 of descriptive statistics shows that the average value of conventional bank deposits and financing (lending) are 11.146% and 10.876% with the standard deviation of .6838% and .6703% respectively. Similarly, the descriptive statistic in parenthesis shows that the average value of Islamic bank deposits and financing are 10.410% and 10.118% with the standard deviation of .7744% and .7468% respectively. The mean value and the standard deviation reflect the central tendency and the deviation from the mean respectively. The average value of bank deposits and financing indicates the average annual deposits and financing for the conventional and Islamic banks in Pakistan. KIBOR which is the MP measure for our estimation has a mean of 10.536% and 10.244 with the standard deviation of 3.038% and 2.986 respectively. It shows the less diversification in the data of MP indicator. The descriptive statistics of macroeconomic indicators and bank specific variables for both conventional and Islamic banks also show the less diversification in the data set.

The skewness and kurtosis also provide the useful information of the data. If the data is normally distributed, then skewness must be zero but for the real-world data the perfect zero skewness is unlikely to happen. The positive value shows that the data is skewed positively, and it concentrated at the high end of measuring scale and if the values of skewness are negative, it means the variables are tail off towards the low end of measuring scale. In our descriptive statistics, the value of KIBOR, GDP, CPI and liquidity are positively skewed, while deposits, financing, MS and bank size are negatively skewed. Similarly, the values of kurtosis measure the normality of the data distribution. The value of less than 3 indicates that normal distribution of data from the point. Kurtosis values greater than 3 indicate that the data is not normally distributed. In table 2 all values meet the criteria of normal distribution except liquidity.

## ESTIMATION RESULTS AND DISCUSSIONS

This section covers the empirical analysis of the role of Interest rate on bank balance sheet. To analyze the impact of MP measure (interest rate), we estimate 4 models. Model no.1 and 2 explain the impact of interest rate on conventional and Islamic bank deposits while model no.3 and 4 estimate the impact of interest rate on conventional and Islamic banks' financing.

In model 1 and 2 of table 4.2, the result suggests that interest rate has a significant positive impact on conventional and Islamic bank deposits, it means that a rise in the interest rate attracts the depositors of both conventional and Islamic banks. On average an increase of 1% in interest rate causes a rise of 0.585% in conventional banks' deposits and 0.547% in Islamic bank deposits, keeping all other factors constant. The result is also consistent with the theories of interest rate which are observed empirically by Athukorala and Sen (2004), Ergec and Arslan (2011), Ostadi and Sarlak (2014), and Mushtaq and Siddique (2017). The positive relationship between interest rate and bank deposits is explained by the theories related to interest rate. It states that a rise in the interest rate induces people to save more because due to the high rate of interest, opportunity cost of holding money also increase.

In model 3 and 4 of table 3, interest rate has significant negative impact on conventional and Islamic bank financing, it means a rise in the interest rate decreases investors' demand for funding due to the high cost of borrowing. On average an increase of 1% in the interest rate will result in 0.609% decreases in conventional and 1.153% in Islamic bank financing, keeping all other factors constant. The result of this model is also consistent with the theories of interest rate and the studies of Karim et al. (2006), Adebola et al. (2011), Janjua et al. (2014), Nahar and Sarker (2016), Zulkhibri (2018) and Rashid et al. (2020). It shows that a rise in interest rate decreases investors' demand for funding in conventional and Islamic banks, due to the high cost of borrowing. The relationship of bank deposits and bank financing with interest rate confirms the existence of bank balance sheet channel in Pakistan.

Other macroeconomic variables like GDP indicates that an increase in output also effects the conventional bank deposits positively, the result is in line with the "Life-cycle hypothesis". The theory of Life-cycle hypothesis specifies that the lifetime of an individual is split up into working period and retirement period. So, an increase in GDP of a country may lead to a rise in per capita income of that particular country, this rise in per capita income further increases the earning and saving of younger age group relative to older age group. Modigliani (1966) also established the fact that a rise in growth rate increases the total income of working population which may cause a rise in aggregate saving. The result is also consistent with the previous studies of Loayza and Shankar (2000), Athukorala and Sen (2004), Ostadi and Sarlak (2014) and Mashamba et al. (2014). On the other hand, GDP effects the Islamic bank deposits negatively. The possible justification of this negative relationship is supported by the theory of permanent income hypothesis. According to this theory, expectation of futures' high income reduces the saving. The result also shows that depositors of Islamic banks might be inclined to dissave or withdraw their money during the high growth period. The result is also in line with the study of (Akhter et al. 2017). It shows that during the period of high growth, customers of Islamic banks save less because of the expectation of futures' high income.

Similarly, GDP also effects the conventional and Islamic bank financing positively and it is in line with the previous studies of Podpiera (2007), Imran and

TABLE 3. Impact of interest rate on banking operations

| | Deposit Models | | Financing Models | |
|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 |
| Variables | C.B | I.B | C.B | I.B |
| KIBOR | .0058<br>(0.000)*** | .0054<br>(0.004)*** | -.0060<br>(0.003)*** | -.0115<br>(0.015)** |
| GDP | .9851<br>(0.006)*** | -2.5422<br>(0.000)*** | 1.1703<br>(0.007)*** | 5.8764<br>(0.000)*** |
| CPI | -.0235<br>(0.000)*** | -.0047<br>(0.001)*** | .0369<br>(0.000)*** | -.0126<br>(0.218) |
| MS | -1.1436<br>(0.000)*** | .9140<br>(0.000)*** | .7030<br>(0.008)*** | -2.5462<br>(0.000)*** |
| BS | .4625<br>(0.000)*** | 1.0604<br>(0.000)*** | .0317<br>(0.314) | .6096<br>(0.000)*** |
| LIQ | .0138<br>(0.766) | .1240<br>(0.162) | -.2157<br>(0.024)** | -1.9098<br>(0.000)*** |
| No. of Observations | 167 | 136 | 167 | 136 |
| No. of Instruments | 36 | 41 | 38 | 44 |
| Number of Banks | 22 | 18 | 22 | 18 |
| AR (2) P value | 0.315 | 0.336 | 0.652 | 0.567 |
| Hansen Test P value | 0.838 | 0.215 | 0.867 | 0.541 |

Figures in parenthesis represent p- statistics
*** Significant at 1%; ** significant at 5%, * significant at 10%.
*Source:* Authors' estimates

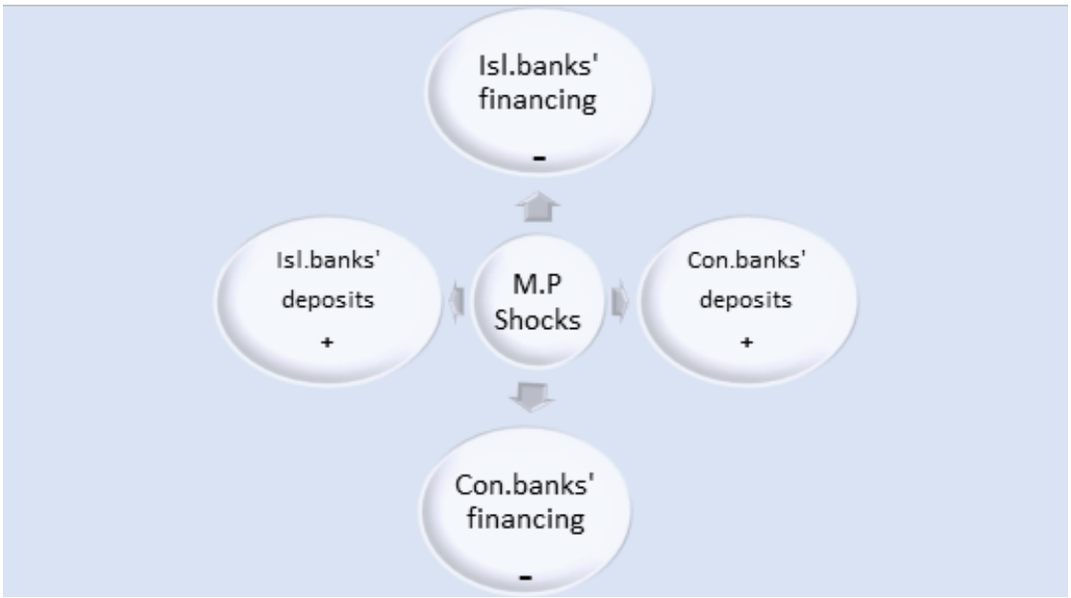


FIGURE 1. The estimates of banking operations (the balance sheet channel). Source: Authors' estimation

Nishat (2013), Nahar and Sarker (2016) and Rashid et al. (2020). The positive sign shows that a high growth in the economy allows banks to supply more credit in the economy because an increase in economic growth increases the domestic income or per capita income, the high level of per capita income allows customers to save more in banks and that enables banks to issue more credit in the economy.

Money supply which is the most important tool of monetary policy has a significant negative impact on conventional bank deposits. The result is in line with the theories of interest rate. The working of these theories states that an increase in money supply decreases the real interest rate, a decline in interest rate decreases the opportunity cost of holding money which in turn leads to an increase in consumption and decrease in saving (Siaw & Lawer 2015). On the other hand, money supply has a significant positive impact on Islamic banking deposits. The result of this hypothesis contradicts with the result of conventional bank's deposits because it can be observed that when there is an excess supply of money, the profit rates of Islamic banks are high as compared to conventional counterpart and it motivates the depositors to maintain the deposits of Islamic banks. The finding of this study is also in a row with the study of Akhter et al. (2017). Similarly, Money supply is positively and significantly associated with conventional banks' financing because when there is an excess supply of money interest rate adjust itself according to the movement of money supply, so increase in money supply decreases the interest rate which may cause a rise in conventional banks' financing. In other words, an increase in money supply reduces the market interest rate, making it less expensive for consumer to get loan from conventional banks. The finding of the study is also in a row with the study of (Imran & Nishat 2013). Contrary to this result, money supply has a significant negative impact on Islamic banks' financing. The result of the study suggests that an increase in money supply causes a rise in inflation as it is discussed in quantity theory of money because there is more money chasing the same number of goods. A rise in inflation also associates with the unpredictability and variability of inflation rate. The unpredictability in inflation rate generates uncertainty about the future's return on investment and that discourages firms from undertaking investment, consequently, reduces the financing of Islamic banks. The result contradicts with the conventional counterparts because, in general it is found that Islamic banks are less risk bearer as compared to conventional counterparts and that encourages Islamic banks to not provide more credit to the economy.

The result of this model is also consistent with the study of Zulkhibri (2018) and Caporale et al. (2020). In our study, inflation which is represented by consumer price index has a significant negative relationship with conventional and Islamic bank deposits. The point of estimation implies that during the period of high inflation, consumers always in an attempt to maintain the same standard of living which stimulates them to forgo their current savings. Further, higher inflation means that people need more money to fulfill their expenses, and this may lead customers towards the low level of saving. Our finding is also consistent with the previous studies of Haron and Azmi (2008), Siaw and Lawer (2015), and Akhter et al. (2017).

Similarly, Inflation is also positively and significantly associated with conventional banks' financing because high inflation devalues the banks' savings, allowing them to supply more and more credit. In other words, banks would prefer to supply more credit because during the period of high inflation, cash holding costs them a lot. Our finding is also consistent with the findings of (Alper et al. 2012) and Rashid et al. (2020). On the other hand, it has a negative impact on Islamic banks' financing, but the result is not significant. The justification of negative impact is that the period of high inflation causes the uncertainty in the market and that can increase the risk of banks. Similarly, inflation also causes the uncertainty about the future's return on investment and that makes Islamic banks to not provide more credit to the economy. Our finding is also consistent with the findings of Zulkhibri (2018).

The study also shows a positive and significant association of bank size with conventional and Islamic bank deposits. The justification provided by the literature states that large banks with economies of scales as well as the banks having the large number of branches network attract the depositors as compared to small sized banks. Bank liquidity and bank deposits are also positively associated in our study, but the impact of liquidity is not significant. The positive sign indicates that people will be willing to save only in those banks which provide the certainty to withdraw the money whenever they want. So, more liquid banks always attract more deposits. Our result is in line with the studies of Finger and Hesse (2009) and Ferrouhi (2017).

Similarly, in our study, bank size has positive association with conventional and Islamic bank financing, but the association is not significant, the result is also in line with the study of (Schmitz 2004; Alper et al. 2012). Similarly, the relationship between bank liquidity and conventional and Islamic banks' financing is negative and statistically significant, which indicates that more liquid banks would issue less loan and when there is shortage of liquidity stock, they will supply more credit because they are not able to absorb monetary policy shocks. Previous studies of Alper et al. (2012) and Janjua et al. (2014) are also in line with our findings.

## CONCLUSION AND POLICY IMPLICATION

The role of banks in monetary policy transmission has recently gained considerable attention from researchers and policymakers of different economies. A vast body of literature has analyzed the role of MPTM in different economies but so far, relatively a lesser number of studies have been devoted to compare the importance of MPTM in the context of dual banking system. In the meanwhile, the study paid relatively more attention towards the role of Islamic banks in MPTM, by taking into consideration the theoretical phenomenon of Islamic banks i.e., interest free banking.

Therefore, we attempted to explore the balance sheet channel of MPTM by measuring the impact of MP on bank deposits and financing of both conventional and Islamic banks in Pakistan. For this, we have setup the unbalanced panel data for both conventional and Islamic banks and performed the panel data analysis. The study estimates 4 models separately to analyze the impact of MP on banking operations (bank deposits and bank financing).

Estimating the models for both banking system separately, the study provides the strong empirical evidence about the role of conventional and Islamic banks in MPTM of Pakistan. Similarly, the study also finds that the response of Islamic banking operations to MP shocks are not different from conventional counterparts because both banking system use KIBOR as a benchmark for their products. The results also highlight the sensitivity of both banking operations to MP shocks are quite different, mainly due to the difference in their nature of contracts and governance structure.

The study also highlights the shortcoming of the dual banking system, the structure of dual banking system is setup to separate the interest-free banking system from interest-based banking system. The results of the study reflect that the idea of dual banking system with this intention is still pre-mature under the current financial setup where both banking system operate under the same monetary environment. We recommend different regulatory and supervisory measures to Islamic banks to meet the essence of their moral economic theories. The study also offers an important dimension for researchers and policymakers of central bank to stabilize the interest rate as it has direct influence on saving and investment. Similarly, policy makers should consider the nature of both banking system while implementing the MP because in dual banking system, the balance sheet of both banking system is influenced by MP shocks. Further, the study finds the presence of Islamic banks' balance sheet channel in Pakistan, and it suggests that for an effective MP, the monetary authorities should consider Islamic banks as a supplement channel of MPTM. The study is limited to Pakistan, and it only covers the balance sheet channel of MPTM but in future, it can be extended for different Islamic countries to compare the impact of MP on banking operations. Similarly, the study can also help the researchers to explore the different alternate channels of MPTM in future.

## REFERENCES


Abdul Karim, Z., Azman-Saini, W.N.W. & Abdul Karim, B. 2011. Bank lending channel of monetary policy: Dynamic panel data study of Malaysia. *Journal of Asia-Pacific Business* 12(3): 225-243.

Abduh, M., Omar, M.A. & Duasa, J. 2011. The impact of crisis and macroeconomic variables towards Islamic banking deposits. *American Journal of Applied Sciences* 8(12): 1413-1418.

Adebola, S.S., Yusoff, W.W. & Dahalan, J. 2011. An ARDL approach to the determinants of nonperforming loans in Islamic banking system in Malaysia. *Kuwait Chapter of Arabian Journal of Business and Management Review* 1(2): 20-30.

Affandi, A. & Tamanni, L. 2010. Monetary policy shocks and islamic banks deposits in Indonesian dual banking system after the financial crisis. *Jurnal Keuangan dan Perbankan* 14(3): 491-500.

Agha, A.I., Ahmed, N., Mubarik, Y.A. & Shah, H. 2005. Transmission mechanism of monetary policy in Pakistan. *SBP-Research Bulletin* 1(1): 1-23.

Akhtar, B., Akhter, W. and Shahbaz, M. 2017. Determinants of deposits in conventional and Islamic banking: a case of an emerging economy. *International Journal of Emerging Markets* 12(2): 296-309.

Alper, K., Hulagu, T. & Keles, G. 2012. An empirical study on liquidity and bank lending. *Central Bank of the Republic of Turkey Working Paper 4*.

Amonoo, E., Acquah, P.K. & Asman, E.E. 2003. The impact of interest rates on demand for credit and loan—repayment by the poor arid SMEs in Ghana. *International Labour Organisation* 1-44.

Arellano, M. & Bover, O. 1995. Another look at the instrumental variable estimation of error-components models. *Journal of econometrics* 68(1): 29-51.

Arellano, M. & Bond, S. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies* 58(2): 277-297.

Athukorala, P.C. & Sen, K. 2004. The determinants of private saving in India. *World Development* 32(3): 491-503.

Aysan, A.F., Disli, M. & Ozturk, H. 2018. Bank lending channel in a dual banking system: why are Islamic banks so responsive?. *The World Economy* 41(3): 674-698.

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(8): 2812-2822.

Bashir, U. & Zaman, A. 2021. Credit channel of monetary transmission mechanism: new insight from svar-dag approach. *Foundation University Journal of Business & Economics 6*(1): 127-146.

Blundell, R. & Bond, S. 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics* 87(1): 115-143.

Bernanke, B.S. & Blinder, A.S. (1988). Credit, money, and aggregate demand. *The American Economic Review 78*(2): 435-439.

Bernanke, B. & Gertler, M. 1990. Financial fragility and economic performance. *The Quarterly Journal of Economics* 105(1): 87-114.

Bernanke, B.S. & Gertler, M. 1995. Inside the black box: the credit channel of monetary policy transmission. *Journal of Economic perspectives* 9(4): 27-48.

Bernanke, B.S., Gertler, M. & Gilchrist, S. (1995). The financial accelerator in a quantitative business cycle framework. *Handbook of Macroeconomics*. Amsterdam: Elsevier.

Beutler, T., Bichsel, R., Bruhin, A. & Danton, J. 2020. The impact of interest rate risk on bank lending. *Journal of Banking & Finance* 115: 105797.

Borio, C. & Gambacorta, L. 2017. Monetary policy and bank lending in a low interest rate environment: diminishing effectiveness?. *Journal of Macroeconomics* 54: 217-231.

Caporale, G.M., Çatık, A.N., Helmi, M.H., Ali, F.M. & Tajik, M. 2020. The bank lending channel in the Malaysian Islamic and conventional banking system. *Global Finance Journal* 45: 100478.

Che Arshad, N. & Nurfadilah, D. 2017. The factors influencing the changes of deposit in Islamic bank: Comparative study between Malaysia and Indonesia. *Journal of Islamic Banking and Finance* 5(2): 37-46.

Choudhry, N. & Mirakhor, A. 1997. Indirect instruments of monetary control in an Islamic Financial system. *Islamic Economic Studies* 4(2).

Efendic, E., D'Hondt, C., De Winne, R. & Corneille, O. 2019. Negative interest rates may be more psychologically acceptable than assumed: Implications for savings. *Available at SSRN 3494988*.

Ekimova, K., Kolmakov, V. & Polyakova, A. 2017. The credit channel of monetary policy transmission: Issues of quantitative measurement. *Economic Annals-XXI* (166): 51-55.

Ergeç, E.H. & Arslan, B.G. 2013. Impact of interest rates on Islamic and conventional banks: the case of Turkey. *Applied Economics* 45(17): 2381-2388.

Ferrouhi, E.M. 2017. Determinants of bank deposits in Morocco. *Maghreb Review of Economics and Management* 4(1): 23-26.

Finger, M.H. & Hesse, M.H. 2009. Lebanon-determinants of commercial bank deposits in a regional financial center. International Monetary Fund.

Friedman, M. & Schwartz, A.J. 2008. A monetary history of the United States, 1867-1960 (Vol. 16). *Princeton University Press*. US

Gambacorta, L. & Mistrulli, P.E. 2004. Does bank capital affect lending behavior?. *Journal of Financial Intermediation* 13(4): 436-457.

Halim, H. & Masih, M. 2017. The causal relationship between islamic bank financing and macroeconomic variables: evidence from Malaysia based on ARDL approach. *MPRA* Paper No. 95697

Hamid, F.S. & Yunus, N.M. 2020. Bank-lending channel of monetary policy transmission: Evidence from ASEAN. *Global Business Review* 21(4): 892-905.

Hansen, L.P. 1982. Large sample properties of generalized method of moments estimators. Econometrica: *Journal of The Econometric Society* 50(4): 1029-1054.

Haron, S. & Ahmad, N. 2000. The effects of conventional interest rates and rate of profit on funds deposited with Islamic banking system in Malaysia. *International Journal of Islamic Financial Services* 1(4): 1-7.

Haron, S. & Azmi, W.N.W. 2008. Determinants of Islamic and conventional deposits in the Malaysian banking system. *Managerial Finance* 34(9): 618-643.

Ibrahim, M.H. 2006. Stock prices and bank loan dynamics in a developing country: The case of Malaysia. *Journal of Applied Economics* 9(1): 71-89.

Imran, K. & Nishat, M. 2013. Determinants of bank credit in Pakistan: A supply side approach. *Economic Modelling* 35: 384-390.

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.

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

Karim, M.Z.A., Harif, A.A.M. & Adziz, A. 2006. Monetary policy and sectoral bank lending in Malaysia. *Global Economic Review* 35(3): 303-326.

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.

Kashyap, A.K., Lamont, O.A. & Stein, J.C. 1994. Credit conditions and the cyclical behavior of inventories. *The Quarterly Journal of Economics* 109(3): 565-592.

Kassim, S.H., Majid, M.S.A. & Yusof, R.M. 2009. Impact of monetary policy shocks on the conventional and Islamic banks in a dual banking system: Evidence from Malaysia. *Journal of Economic Cooperation and Development* 30(1): 41-58.

Kasri, R. & Kassim, S.H. 2009. Empirical determinants of saving in the Islamic banks: Evidence from Indonesia. *Journal of King Abdulaziz University: Islamic Economics* 22(2): 1-21.

Kassim, S.H., Majid, M.S.A. & Yusof, R.M. 2009. Impact of monetary policy shocks on the conventional and Islamic banks in a dual banking system: Evidence from Malaysia. *Journal of Economic Cooperation and Development* 30(1): 41-58.

King, R.G. & Plosser, C.I. 1984. Money, credit, and prices in a real business cycle. *The American Economic Review* 74(3): 363-380.

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

Larbi-Siaw, O. & Lawer, P.A. 2015. Determinants of bank deposits in Ghana: A cointegration approach. *Asian Journal of Economics and Empirical Research* 2(1): 1-7.

Levine, R., Loayza, N. & Beck, T. 2000. Financial intermediation and growth: Causality and causes. *Journal of monetary Economics* 46(1): 31-77.

Li, B.G., Adam, C.S. & Berg, A. 2016. Q&A: Seven questions on estimating the monetary transmission mechanism in low-income countries. *IMF Research Bulletin 2016*(001).

Loayza, N. & Shankar, R. 2000. Private saving in India. *The World Bank Economic Review* 14(3): 571-594.

Makinde, H.O. 2016. Implications of commercial bank loans on economic growth in Nigeria (1986-2014). *Journal*

*of Emerging Trends in Economics and Management Sciences* 7(3): 124-136.

Mashamba, T., Magweva, R. & Gumbo, L.C. 2014. Analysing the relationship between banks' deposit interest rate and deposit mobilisation: Empirical evidence from Zimbabwean Commercial Banks (1980-2006) *IOSR Journal of Business and Management (IOSR-JBM)* 16(1): 64-75.

Modigliani, F. 1966. The life cycle hypothesis of saving, the demand for wealth and the supply of capital. *Social research* 33(2): 160-217.

Mushtaq, S. & Siddiqui, D.A. 2017. Effect of interest rate on bank deposits: Evidences from Islamic and non-Islamic economies. *Future Business Journal* 3(1): 1-8.

Nahar, S. & Sarker, N. 2016. Are macroeconomic factors substantially influential for Islamic bank financing? Cross-country evidence. *Journal of Business and Management* 18(6): 20-27.

Naiborhu, E.D. 2020. The lending channel of monetary policy in Indonesia. *Journal of Asian Economics 67*: 101175.

Nazib, N.A., & Masih, M. 2017. The response of monetary policy shocks on Islamic bank deposits: evidence from Malaysia based on ARDL approach. *MPRA* Paper No. 82094.

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.

Ojeaga, P., Ojeaga, D. & Odejimi, D.O. 2013. The impact of interest rate on bank deposits evidence from the Nigerian banking sector. *MPRA* Paper No. 53238.

Olokoyo, F.O. 2011. Determinants of commercial banks' lending behavior in Nigeria. *International Journal of Financial Research* 2(2): 61-72.

Ostadi, H. & Sarlak, A. 2014. Effective factors on the absorption of bank deposits in order to increase the relative share of Isfahan Sepah Bank. *International Journal of Academic Research in Economics and Management Sciences* 3(4): 139-149.

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

Rachmawati, E. & Syamsulhakim, E. 2004. Factors affecting mudaraba deposits in Indonesia. In *Third International Islamic Banking and Finance Conference*.

Radwan, M. & Drissi, S. 2020. Analysis of the transmission asymmetry of monetary policy in a dual banking system: econometric modelling (Case of Turkey). *European Journal of Islamic Finance* 16(3): 1-11.

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.

Rahooja, S., Ali, A., Ahmed, J., Hussain, F. & Rifat, R. 2014. Monetary Policy and Bank Hetrogeneity: Effectiveness of Bank Lending Channel in Pakistan. *MPRA* paper No. 60473

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 size and liquidity matter? *Research in International Business and Finance 52*: 101-123.

Raza, H., Hena, S. & Saeed, A. 2017. The effects of Interest rate, on savings and deposits in Pakistan. *International Journal of Business and General Management (IJBGM)* 6(6): 67-74.

Rosly, S.A. 1999. Al-Bay'Bithaman Ajil financing: impacts on Islamic banking performance. *Thunderbird International Business Review* 41(4-5): 461-480.

Šeho, M., Bacha, O.I. & Smolo, E. 2020. The effects of interest rate on Islamic bank financing instruments: Cross-country evidence from dual-banking systems. *Pacific-Basin Finance Journal* 62: 101292.

Shabbir, S. 2012. Balance sheet channel of monetary transmission in Pakistan: An empirical investigation. *SBP Research Bulletin* 8(1): 1-12.

Shah, SMAR & Rashid, A. 2015. Governing Principals of Shari'ah: A Study of Islamic Business Transactions for Contemporary Practices. *Al-Azhāar* Special Edition 1(2): 158-170.

Shah. MAR, RazaK. & Alazhari, M.A. 2018. An Introduction to Monetary Policy Framework in Pakistan: Instruments, Objectives, and Mechanism. *Pakistan Journal of Economic Studies (PJES)* 1(2): 111-129.

Shah, S.M.A.R. & Rashid, A. 2019. The credit supply channel of monetary policy transmission mechanism: an empirical Investigation of Islamic banks in Pakistan Versus Malaysia. *Journal of Islamic Monetary Economics and Finance* 5(1): 21-36.

Shah, S.M.A.R., Farooq, M.U. & Akmal, M. 2021. Embracing Islamic banking as a new engine toward economic growth. In *Contemporary Issues in Islamic Social Finance* edited by Hussain M-D. Q. & M. Ishaq, B. 169-184. Routledge.

Sims, C.A. 1992. Interpreting the macroeconomic time series facts: The effects of monetary policy. *European Economic Review* 36(5): 975-1000.

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

Utama, C. 2020. The effect of twin-shock on monetary and fiscal policies in Indonesia. *Jurnal Ekonomi Malaysia* 54(2): 1-12.

Yemba, B.P., Tang, B., Kitenge, E. & Nsumbu, J. 2020. Divisia monetary aggregate and monetary transmission mechanism in the Democratic Republic of Congo (DRC). *Applied Economics Letters* 27(4): 291-297.

Youngju Kim, Hyunjoon Lim & Wook Sohn 2021. Bank competition and transmission of monetary policy. *Applied Economics Letters* 28(5): 421-425.

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

Zainol, Z. & Kassim, S.H. 2010. An analysis of Islamic banks' exposure to rate of return risk. *Journal of Economic Cooperation and Development* 31(1): 59-84.

Zulkhibri, M. 2018. The impact of monetary policy on Islamic bank financing: bank-level evidence from Malaysia. *Journal of Economics, Finance and Administrative Science* 23(46): 306-322.

Anis Kabir
Department of Economics
Pakistan Institute of Development Economics (PIDE)
P.O.Box 1091 Islamabad, PAKISTAN.
Email: aniskabirkhan336@gmail.com

Syed Muhammad Abdul Rehman Shah*
Department of Basic Sciences & Humanities
University of Engineering and Technology (UET)
P.O.Box 47050 Taxila, PAKISTAN.
Email: a.rehman@uettaxila.edu.pk

M. Kabir Hassan
Department of Economics and Finance
University of New Orleans
P.O.Box 3665, UNITED STATES.
Email: mhassan@uno.edu

Muhammad Akmal
MCB Islamic Bank Limited
P.O.Box 12023 Sheikhupura Road
Shahdara, Lahore, PAKISTAN.
E-mail: makmal.maitla@gmail.com

* Corresponding author