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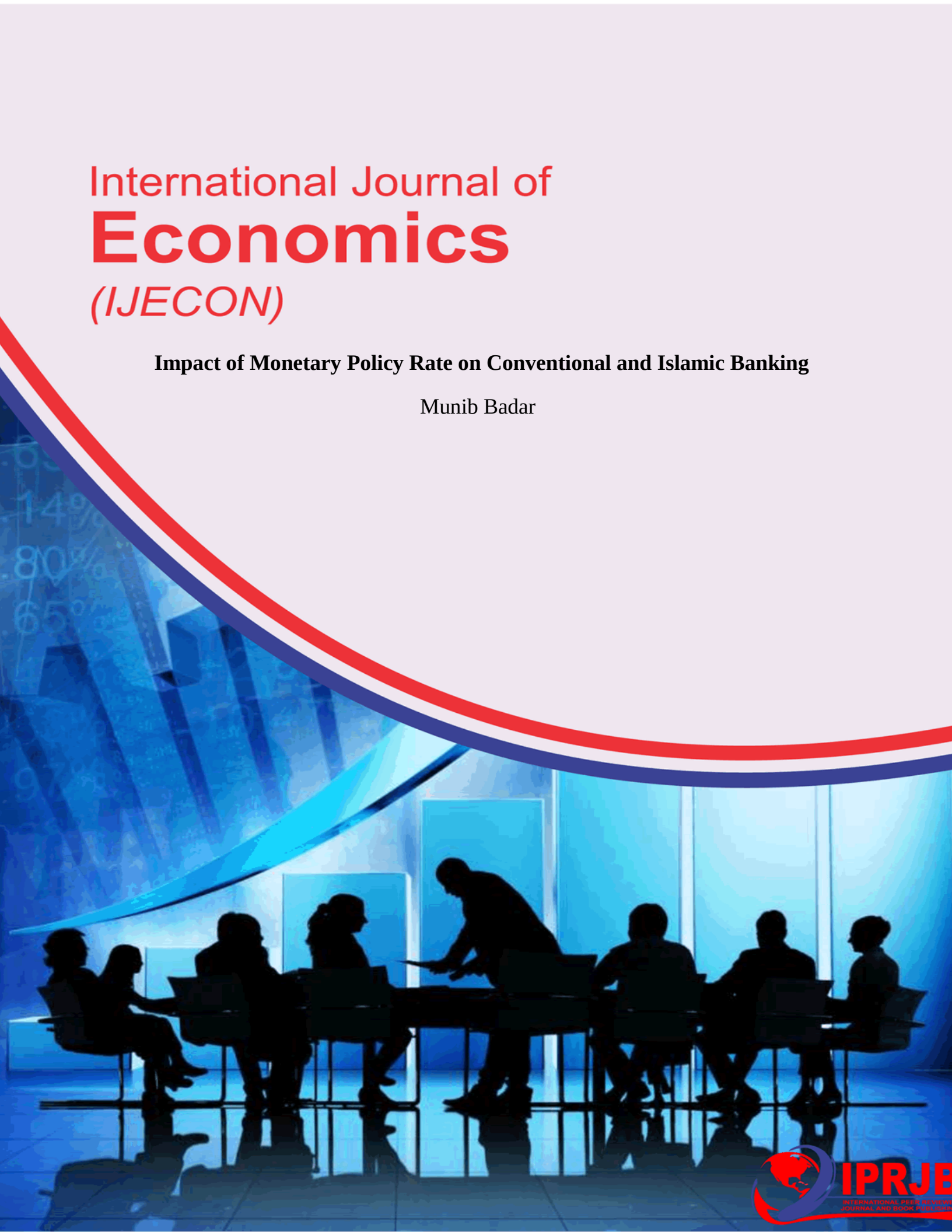

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Article History

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Abstract

Purpose: This study examine the role of banking portfolios based on religious philosophy i.e. Islamic banks in comparison of conventional banks of Pakistan to determine whether both of the portfolios of Islamic and conventional banks absorbs monetary policy shocks on the basis of bank specific religious philosophy.

Methodology: The study collected quarterly data from 2005 to 2018 from the official sources of the central bank of Pakistan i.e. State Bank of Pakistan and tested by using econometric techniques. The variables include proxy of central bank Policy Rate, Gross Domestic Product and banking portfolios.

Findings: The outcome of the study reveals that Islamic philosophy of banks do not contribute significantly in varying effects of monetary policy.

Unique Contribution to Theory, Practice and Policy: The government may develop a dual monetary system and introduce pricing mechanisms for Islamic banks separately by introducing sharia-compliant monetary policy instruments to enhance Islamic share in the overall financial plan. Further, a limited number of Sharia advisors who are simultaneously equipped with financial knowledge in another handicap in sharia-compliant product development.

Keywords: *Islamic Deposit, Islamic Financing, Conventional Deposit, Conventional Loans, Inter Bank Rate, Monetary Policy Rate, Gross Domestic Product, Vector Auto Regression, Impulse Response Function, Variance Decomposition Analysis*

INTRODUCTION

In the past few decades, the focus has been shifted to developing Islamic banking products, the viability of Islamic banking and its implications on society from socioeconomic perspectives. A considerable amount of literature has been published on converting conventional products of commercial banks into Islamic versions as both are based on discrete philosophical foundations. An Islamic financial system provides surety of the conformance of norms and ethics promulgated by Islam as a religion.

The rudimentary truth of the Islamic financial system is to deal fairly and ensure fairness. Islam provides essential freedom to enter into a transaction; however, it is constrained by other norms such as the exclusion of Riba (Interest) and Gharar (Uncertainty or doubt). Islamic banking does not permit charging of interest, bans short-selling of shares and derivatives, and prohibits selling assets that Islamic banks do not own. In simple words, Islamic banks do not extend funding facilities in projects deemed to be "Haraam" or do not fall under Islamic jurisprudence and related to Haraam tasks or commodities, e.g. pornography, consumption of alcohol or pork.

The Islamic Banking system has emerged as a competitive alternative to conventional banking during the last four decades. Islamic banks commenced their early operations in Egypt and Malaysia during the Sixties. Theoretical underpinnings of Islamic banking characterized Islamic banks as suppliers of capital or equity instead of the lender of money as postulated in conventional banking. Once funds are given on an equity basis, establish a Profit and Loss sharing (PLS) paradigm where Islamic banks mainly carry out their operations using the PLS paradigm. It received immense popularity due to its risk-sharing nature, which attracts customers of both Muslims and non-Muslims.

In Islamic philosophy, risk-sharing prevails when contract parties, e.g. banks and depositors, share profits and losses based on fair principles that abhor interest or Riba. It means to forbid shifting entire risk on one party irrespective of their share in investment (Source sharia Standards published by Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI)). Due to the distinguishing nature of Islamic philosophy, Islamic banks cannot buy deposits at a fixed rate on demand accounts or in time deposits. Likewise, Islamic banks offer financing facilities backed by a particular mode of Islamic finance with the assets and risk profile specification. Some well-known Islamic methods of finance used in Islamic banks are Ijara, Musharika, Istisna, Salam and Murabaha.

The above discussion favours structural advantages an Islamic financial system holds over the conventional banking model, which allows Islamic banks to absorb macro-financial shocks better than conventional banks (Mills & Presley, 1999) (Dridi & Hasan, 2010) (El-Gamal, 2006). Other global financial crises of the last decade and in the backdrop of recurring banking and financial uncertainties force market players and researchers to contemplate any better financial model which can adequately insulate the impact of the impending financial crisis in future. Islamic banking PLS and asset back financial model captivated attention whether it is considered a viable alternative to the present banking system. Several studies compare the relative performance, risk and resiliency of Islamic and conventional banks and segregate the difference emerging in both financial markets (Dridi & Hasan, 2010) (Beck, Demirgüç-Kunt, & Merrouche, 2010).

The monetary policy concept was invented with the regularization of the monetary sector, which is based on the idea that monetary policy influence economic activity. Monetary policy through monetary aggregates brings changes in real activity is first observed by the seminal work conducted by Friedman

published in 1963, who unfolded that monetary policy through monetary aggregates brings changes in real activity (Schwartz, 1963). Later, significant work by King et al. who discovered that the correlation between money supply and output occurs by financial intermediaries instead of monetary shocks directly (King & Plosser, 1984). Monetary policy deals with the flow of funds in an economy for long-term goals, i.e. economic growth, employment, and a stable exchange rate. The central bank achieves these goals through contraction or expansion of money supply by the contractionary or expansionary monetary stance a central bank undertakes according to the requirement of the economy. An expansionary stance of monetary authority focuses on expanding the money supply, while a contractionary stance contracts the money supply from the economy. (Adrian & Shin, 2009).

An important question from a research perspective arises whether monetary transmission through banking portfolios will alter its strength when the Islamic segment of the banking sector is strengthening and progressing. In addition, it entails greater significance whether monetary transmission through the Islamic component may vary its response through its conventional counterpart.

Islamic banking has been progressing by leaps and bounds, especially in Islamic countries such as Pakistan; some fundamental philosophical differences prevail in applying both schools of thought. Studying the varying effects of monetary transmission in both financial systems entails valuable information for policymakers. This novel study will witness whether Islamic banks absorb monetary shocks uniformly as conventional banks in Pakistan. In Pakistan, Islamic banks hold almost 18 per cent of the assets of the entire banking industry, and this information may further unearth the effectiveness of monetary transmission in the presence of Islamic banking assets. Hence, the question arises that what is the impact of monetary policy rate on bank loans, deposits and investments segregated on the basis of Islamic and conventional terms?

We state our research hypotheses as follows:

i. An increase in monetary policy rate leads to a decrease in bank loans of Islamic and conventional banks (Negative)
ii. An increase in monetary policy rate is negatively associated with Advances in conventional banks
iii. An increase in monetary policy rate is negatively associated with Advances in Islamic banks
iv. An increase in monetary policy rate is negatively associated with Deposits of conventional banks
v. An increase in monetary policy rate is negatively associated with Deposits of Islamic banks
vi. An increase in monetary policy rate is negatively associated with Government Securities of conventional banks
vii. An increase in monetary policy rate is negatively associated with Government Securities of Islamic banks.

LITERATURE REVIEW

Today Islamic Finance constitutes 1 to 2 % of the global financial assets worldwide. Islamic banking is one of the most rapidly growing segments of international finance, which is expanding at 20 per cent every year. Total Islamic financial assets are estimated at around 1.7 trillion USD growing with an annual growth of 17 % over the last four years. More than 300 Islamic Banks and Windows will be operating in sixty countries by 2018. Similarly, 750 Islamic Funds are being used with around 60 billion USD assets

value. In some countries portion of Islamic finance has reached almost the size of conventional finance, e.g. Malaysia, Iran, Bahrain, Kuwait, Oman, Qatar and UAE. Likewise, Indonesia and Pakistan have also been experiencing rapid growth; however, Islamic finance is not limited to the Muslim world; instead, Islamic banking facilitates Western countries. Multinational conventional banks have opened their Islamic windows, including Barclays, BNP Paribus, Citi Group, Deutsche Bank, Standard Chartered Bank, etc. (Deloitte Islamic Finance broacher www.deloitte.com).

Total assets of the Islamic banking industry in Pakistan were recorded as Rs 2,272 billion (20 Billion USD approx.) till the end of Dec 2017. On the funding side, deposits of Islamic banks were recorded as Rs 1,885 billion (17.13 Billion USD approx.). During 2017, Deposits and Assets of the Islamic banking industry witnessed a yearly growth of 19.8 and 22.6 per cent, respectively. Market share of assets held by the Islamic banking industry was recorded as 12.4 per cent and deposits as 14.5 per cent of the overall banking industry. The Islamic banking industry's investment (net) was recorded at Rs 534 billion (4.85 Billion USD approx) by the end of Dec 2017. The funds disbursed by the Islamic banking industry were recorded as Rs 1,207 billion (10.97 Billion USD), with an annual growth of 16.6 per cent (Islamic Banking bulletin issued by SBP 2017). Islamic finance have helped broaden the access to Shariah-compliant financial products. In FY17, one third of the entire lending to the private sector was made by Islamic banks (State Bank of Pakistan Annual Report 2016–17 www.sbp.org.pk).

From a bank lending perspective, whether Islamic banks demonstrate varying effects after the monetary transmission is the focus of our discussion, which requires the presentation of empirical references to support this aspect. Studies emphasizing varying or heterogeneous effects favour hidden benefits in the Interest-free system, e.g. a study exploring the Tunisian banking system revealed that interest-free instruments are more stable (Darrat, 1988). Similarly, in Iran's interest, accessible money demand functions are found sound in both the short and long run, where coefficients are seen invariant towards policy shocks due to the early transformation of the Iranian banking system into the Islamic banking system since 1984 (Kia, 2002). A banking system based on profit sharing is found insulating monetary shocks compared to its conventional counterpart and minimises the possibility of financial instability (Kia & Darrat, 2003).

The Islamic banking system appears in crises proof due to its asset back nature. It is analyzed in Malaysia's study, which compiled monthly data from 1994 to 1999. The study proposed that interest-free monetary instruments are more reliable and effective during monetary tightening than those issued by their conventional counterparts (Kaleem & Isa, 2006). Another study examines the bank lending channels in the dual banking system prevailing in Malaysia, also advocating Islamic finance is less responsive than conventional credit towards monetary shock in both regimes, whether high-interest rate or low. This distinction suggests that Islamic banks observe a unique Islamic philosophy to govern their matters (Caporale, Catik, Helmi, Menla Ali, & Tajik, 2016).

Some studies revealed that Islamic financing is more sensitive to monetary shocks in Malaysia as both deposits and financings are exposed to interest rate variations. However, these variations do not influence real production (Sukmana & Kassim, 2010). In a similar line, Kassim et al. (2009) studied the roles of Islamic banks in the monetary transmission of Malaysia. In their analysis, Islamic deposits are more sensitive to monetary shocks than Islamic financings. They witnessed the existence of DCR in the Islamic banks of Malaysia. They used VAR to compile results for monthly data collected from Jan 1994 to May 2007. They used variables, i.e. Industrial production index (IPI), Islamic financings, Islamic deposits,

and overnight interest rate. The sensitivity of Islamic funding toward monetary shocks is revalidated by Ibrahim and Sukmana (2011) by using a different array of data (Sukmana & Kassim, 2010) (Kasri & Kassim, 2009) (Ibrahim & Sukmana, 2011).

Other studies also preferred the VAR approach to unfold the association between policy shocks and banking portfolios. For instance, interest rate and savings in Islamic banks show a positive correlation once the policy rate changes (Kasri & Kassim, 2009). Other researchers also notify this positive association as monetary policy rates cause deposit portfolios of Islamic banks to move upward (Kassim, Majid, & Shabri, 2009). VAR results alone provide an obscure view; therefore are used to derive impulse response functions and vector decomposition analysis so that response of given variables can be gauged after giving one standard deviation shock of the policy rate. Proxy monetary shocks are taken in the form of the overnight policy rate in another study investigating the impact of monetary shocks on Islamic deposits and Islamic finance, where the real activity is denoted by the industrial production index (IPI). It is concluded that Islamic deposits are more sensitive to interest rate shocks (Sukmana & Kassim, 2010).

Other methods used by some researchers are, e.g. Structural Vector Auto Regression (SVAR) to detect the impact of monetary shocks on Islamic banks' financing. It is concluded that Islamic financing is more sensitive to monetary shock than conventional financing. Islamic financing declines immediately after increasing the interest rate (Akhatova, Zainal, & Ibrahim, 2016). Conventional bank's deposits rates are compared with the speed of return offered by PLS deposits in Malaysia and Turkey. Findings of this study reveal that rates provided to the conventional bank deposit and Islamic bank deposit demonstrated a long run co-integration. While the time-varying volatility of both rates was statistically correlated, conventional banks' deposit rate granger causes Islamic banks to deposit rate. Moreover, Islamic finance replicates the functions of conventional Islamic finance instruments, which is a form of rent-seeking legal arbitrage. They also witnessed that most Islamic scholars endorsed Islamic banking as somewhat protected from the risk associated with interest rate movement due to its risk-sharing nature (Cevik & Charap, 2015).

A few studies are also referred to which do not favour heterogeneous response of Islamic banks, e.g. From a different approach, some researchers analysed that the Islamic banking system possesses a disadvantageous position due to imposition of fixed interest rates as rentals for those financing given on fixed-term like Ijara. In these cases, if interest moves upward, Islamic banks would have to charge the same rentals without incorporating the effect of monetary shock. Hence, In Malaysia, Islamic banks suffered from a negative funding gap when conventional banks increased their pricing to increase the market interest rates. Another weakness is prevailing in the current financial system, which does not support interest-free banking by arbitrage, which enables conventional banks to take advantage of the rates prevailing in two different markets. Therefore, conventional banks are free to exploit both markets and earn better profit from the interest rate differential prevailing in two other markets. At the same time, Islamic banks are curtailed to raise funds from the Islamic financial market (Rosly, 1999).

Another study used VAR for the data collected from the financial market of Malaysia for a period started from 1994 to 2007. The overnight interest rate is used to proxy monetary shocks on both data sets derived from conventional and Islamic financial markets. This study revealed that interest rate shocks affect Islamic financings through Islamic deposits in the presence of displaced commercial risk (DCR) (Sukmana & Kassim, 2010). However, a study negates the impact of monetary shocks on Islamic banks and found a non-significant relationship between Islamic bank deposits and monetary shocks using the

autoregressive distributed lag (ARDL) approach on data from 23 Muslim countries (Mushtaq & Siddiqui, 2017).

On the same line, Chong and Liu presented their results as no significant differences prevail between the deposit mix of Islamic and conventional banks. A small percentage of Islamic deposits falls under the PLS category, while the rest use the same trajectory as conventional deposits as a benchmark (Chong & Liu, 2009). A study examined an insignificant difference between Islamic and conventional banks because lending behaviour derived from the exact pricing mechanism. This study used panel estimation of different banks for the data gathered at bank-level characteristics such as liquidity, size, and capital for both conventional and Islamic banks (Mobin & Masih, 2014).

Another study on the same lines using bank-specific characteristics in a dual banking system using panel regression reveals no significant difference between Islamic and conventional bank lending behaviour regarding monetary shocks. Results suggest that bank-specific abilities do not distinguish Islamic banks from their conventional counterparts; however, bank-specific characteristics, i.e. size, liquidity, and capital, hold importance towards monetary shocks (Zulkhibri, 2015).

Based on the above literature review, some mixed conclusions are derived by researchers based on the circumstances and dynamics prevailing in different financial markets. However, studying both responses of conventional and Islamic banks towards monetary shocks entails essential information for policymakers so that appropriate steps may be taken to bring desired results.

METHODOLOGY

To incorporate bank-related variables in our study, we shall be looking at the balance sheet of both Islamic and conventional banks. On the liability side, deposits are the most significant variable received from banks' customers as demand and time deposits. Therefore, total deposits of all the commercial banks are calculated and segregated based on their retention at Islamic and conventional banks.

Likewise, the asset side of the banking portfolio comprises financings issued by Islamic banks following sharia principles based on asset-backed nature and credit portfolios developed by conventional banks without any sharia governance. Variables exist on asset sides to analyze investment and credit portfolios of the banks where all the deposits received by both Islamic and conventional banks are either used to fund credit demand of the private sector or to invest in government securities like treasury bills and investment bonds. However, Islamic banks invest in Sharia complied securities known as Sukuks. Generally, Islamic banks face excess liquidity problems because Sukuks are issued few and far between, whereas treasury bills are issued regularly on a fortnightly basis.

The monetary policy stance of the central bank is demonstrated by the policy rate issued on a bi-monthly basis induces money market rate prevails in the money market, also known as interbank rate, i.e. auctioned daily with the name of Karachi Interbank offer rate (KIBOR). However, Islamic banks have faced pricing problems since their inception because no inherited pricing mechanism exists in the Islamic financial market. Therefore, Islamic banks have to sell their contracts by using similar pricing which conventional banks, i.e. KIBOR.

In our study, real activity is represented by Gross Domestic Product (GDP) and CPI. The entire data is gathered quarterly from 2005 to 2018 in log form except for KIBOR..

Table 1: Impact of Monetary Policy Rate on Conventional and Islamic Banking

Conceptual/Theoretical Framework

	Dependent Variables	Relationship	Code	Independent Variables	Sources	Econometric Model Used by Various Authors
Impact of Monetary Policy Rate on Conventional and Islamic Banking	Islamic Deposits	-	**ID**	KIBOR	(Darrat, 1988), (Kia, 2002), (Kia & Darrat, 2003), (Kaleem & Isa, 2006), (Caporale et al., 2016), (Sukmana & Kassim, 2010), (Rosly, 1999), (Chong & Liu, 2009),	VAR, IRF, VDA (Sukmana & Kassim, 2010) (Kasri & Kassim, 2009) (Ibrahim & Sukmana, 2011) VAR (Kasri & Kassim, 2009) VAR (Kassim et al., 2009). ARDL (Mushtaq & Siddiqui, 2017) VAR, IRF, VDA (Sukmana & Kassim, 2010). Structural Vector Auto Regression (SVAR) (Akhatova et al., 2016) Granger Casuality (Cevik & Charap, 2015)
	Conventional Deposits	-	**CD**			
	Islamic Finance	-	**IF**			
	Conventional Finance	-	**CF**			
	Islamic Investment	-	**II**			
	Conventional Investment	-	**CI**			
		+	**KBR**			
	Gross Domestic Product	-	**GDP**			

The data for this research is collected from the published sources of the State Bank of Pakistan (www.sbp.org.pk); therefore, no permissions will be required to collect data other than the respondents' informed consent.

The Cumulative sum control chart CUSUM test is employed to check data stability or seasonal effects of the data, which improves the ability to detect small shifts by incorporating values derived from current and previous data. It plots the cumulative sum of the deviation of the sample values that will vary randomly around a zero mean. This test checks the structural break or model stability (Brown, Durbin, & Evans, 1975). Unit root tests are employed whether a variable is not stationary and possesses a unit root where the null hypothesis identifies the presence of a unit root and the alternative hypothesis shows stationarity. The Augmented Dickey-Fuller (ADF) test will be employed to check Unit roots. The T statistics of ADF results are more significant than the values at a 5 or 10 % significance level at the first difference. The lag length determination test is beneficial to avoid autocorrelation (Fuller, 1976).

We employ the Vector Autoregression VAR methodology developed by Sims in 1980, which assumed that all variables in the model are endogenous therefore called a non-theoretical model. This study examines the effects of monetary shocks on real output and prices. Prominent empirical literature

witnesses the utilization of the VAR approach based on variance decomposition analysis and impulse response functions to examine the effect of credit channel on critical economic variables, i.e. output and inflation (Agha, Ahmed, Mubarik, & Shah, 2005; Baig; Bernanke & Blinder, 1992; Hussain, Berg, & Aiyar, 2009).

The impulse response function indicates how the economy reacts with time's passage to exogenous impulses, also called shocks used in a VAR system. Impulses taken in the exogenous form include policy shocks in the shape of change in monetary tools, e.g. policy rate or interest rate. The impulse response function detects the reaction of endogenous macroeconomic variables, e.g., output and prices, at the time of shock, and subsequently, the shock is passed. Since our focus in this study is to interpret the monetary shock on real output, we drive an impulse response function that traces real output's reaction at one standard deviation shock to the interest rate. To know the proportion of fluctuations of given variables passed through different shocks in the VAR system can be examined through variance decomposition. First, it reveals the fraction of forecast variance error of the variables caused by their shocks versus shocks of endogenous variables.

An essential issue in VAR estimation is to use the appropriate strategy in the specification of the VAR, whether VAR should be estimated in pure differences or levels without the imposition of any restriction or with restriction usually known as Vector Error Correction Model VECM to allow the presence of co-integration. It depends on the data properties, i.e. unit root and co-integration. If the variables in a VAR are found non-stationary and are not co-integrated, then VAR should be specified in pure differences. While estimating the VARs where some variables are non-stationary does not affect the estimator consistency. Instead, it affects efficiency by being non-stationary, as referred to by Sims 1980 (Sims, Stock, & Watson, 1990). VECM is estimated if co-integration exists, and if co-integration does not exist, then imposing co-integration may not be an appropriate estimation strategy. Imposing inappropriate co-integration relationships can lead to biased estimates and result in a biased impulse response derived from the reduced form of VAR. Consequently, unrestricted VAR with a difference will be estimated if no co-integration exists and variables are stationary at first. VECM technique will be employed to detect short term dynamics and speed of adjustment (Sims, 1980). VECM is the preferred specification since it can generate efficient estimates without losing information for the long-run relationship among the variables. However, many researchers suggested against simply looking at the statistical properties of the data to decide on appropriate specifications (Ramaswamy & Sløk, 1998).

The following VAR model is identified as follows (Den Haan, 2000),

Equation No 1

$$X_t = \alpha + u_1 t + \sum_{l=1}^{L} \beta_t X_{t-1} + \in_t$$

Here X_t is a vector of variables, t represents time trend, and L is the lag dimension of the panel VAR. It involves estimating the above equitation and obtaining values for K-period forecasts for variables in Xt and later evaluating K-period forecast errors, net of actual values Xt and in-sample forecast values. The minimum number of lags will be restricted to two using Schwarz's Bayesian information criterion, which helps us preserve data length.

Equation No 2

X_t = [GDP B KIBOR]

Real activity is represented as GDP, while KIBOR denotes monetary shocks. Bank related variables are shown in the equation as B, i.e. loans, deposits and investment portfolios of Islamic and conventional banks. In our study, various VARs will be estimated with the following Xt Matrix as follows;

- GDP, Islamic Deposits (ID), Conventional Deposits (CD), KIBOR (KBR)
- GDP, Conventional Investment (CI), Islamic Investment (II), KIBOR (KBR)
- GDP, Islamic Finance (IF), Conventional Finance (CF), KIBOR (KBR)

Estimation and Inferences

Unit Root Test and Lag Length Determination

The Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests were employed to check Unit roots. T statistics of ADF and PP results are more significant than the values at the first difference at a 5 or 10 % level of significance. The lag length determination test is instrumental in avoiding autocorrelation in the VAR system. After the employment of lag, optimum autocorrelation can be avoided. Our study found that the equation model has a lag optimum at lag 4.

Data Stability Test

The Cumulative sum control chart CUSUM test is employed to check data stability or seasonal effects of the data, which improves the ability to detect small shifts by incorporating values derived from current and previous data. It plots the cumulative sum of the deviation of the sample values that will vary randomly around a mean zero. In addition, this test checks the structural break or model stability (Brown et al., 1975). CUSUM plots are shown in Figures 37, 38 and 39, providing structural stability of data within critical bounds of a 5 per cent level of significance.

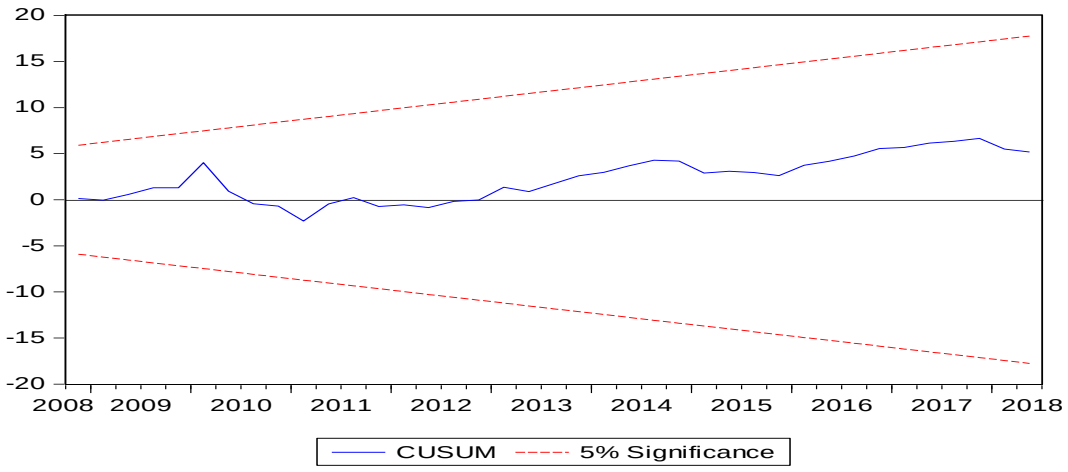

Figure 1: CUSUM Plot of Finances vs Islamic Finance

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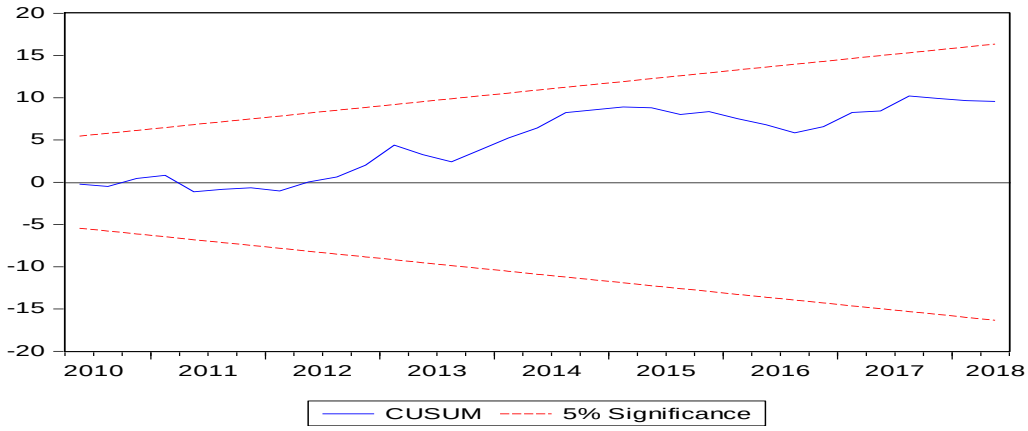

Figure 2: CUSUM of Deposits vs Islamic Deposits

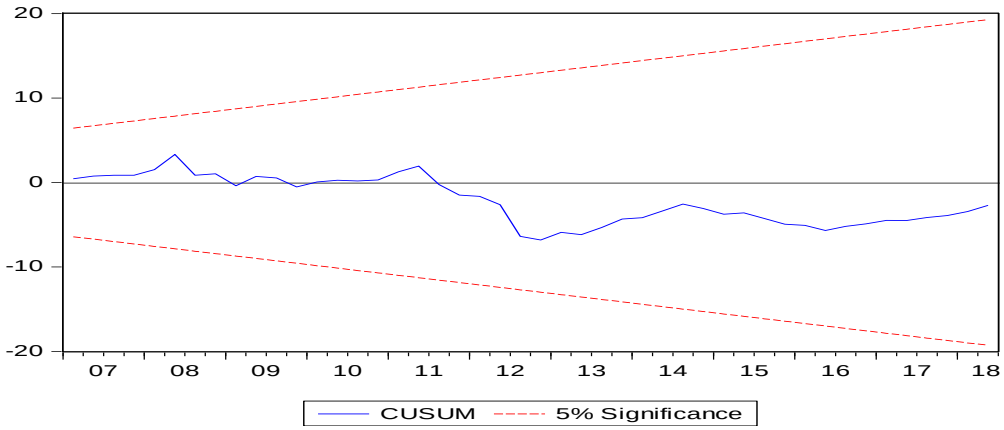

Figure 3: CUSUM of Investments vs Islamic Investments

Co-Integration Test

JJ (Johansen & Juselius, 1990) tests are used to find Cointegration, which means detecting a long-run relationship among variables during the integration process. Table No 2, 3 and 4 showed co-integration interactions of Conventional Finance, Islamic Finance, Conventional Deposit, and Islamic Deposits, and Conventional Investment Vs Islamic Investments. No co-integration rank or equation is found in VAR models of Conventional and Islamic Finance. Likewise, no Cointegration is found among the models of conventional and Islamic Deposit; however, conventional and Islamic Investments were found co-integrated, which requires the introduction of the Vector Error correction Model VECM instead of using the VAR test (Hasanah, Ascarya, & Achsani, 2008) to generate impulse responses and variance decomposition.

Table 2: Co-Integration of Series Conventional Finance vs Islamic Finance

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.476606	56.09865	47.85613	0.0070
At most 1	0.256400	24.37507	29.79707	0.1850
At most 2	0.134267	9.858744	15.49471	0.2918
At most 3	0.055425	2.793996	3.841466	0.0946

Table 3: Co-Integration of Series Conventional Deposits vs Islamic Deposits

Series: CD ID GDP KBR

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.651504	100.0439	47.85613	0.0000
At most 1 *	0.440659	48.39163	29.79707	0.0001
At most 2 *	0.233590	19.92282	15.49471	0.0101
At most 3 *	0.131120	6.886979	3.841466	0.0087

Table 4: Co-Integration of Series Conventional Investments vs Islamic Investments

Series: CI GDP II KBR

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.580882	82.19985	47.85613	0.0000
At most 1 *	0.332594	39.58937	29.79707	0.0027
At most 2 *	0.220668	19.77586	15.49471	0.0106
At most 3 *	0.142961	7.559296	3.841466	0.0060

Impulse Response Function and Variance Decomposition

Results of Impulse Response Functions Figure 4 showed that conventional financing increased to almost 40 basis points (bps) until the end of the third quarter above the baseline after 100 basis points or one standard deviation positive shock of KIBOR. Likewise, GDP decreased up to 30 bps after one standard deviation shock of Conventional finance till the end of the sixth quarter. Whereas Islamic finance decreased up to 20 bps after receiving 100 bps of the positive shock of KIBOR till the end of the sixth quarter. However, Islamic financing could not affect GDP significantly because the size of Islamic financing was recorded as one-sixth of the conventional financing till the end of 2018.

Figure 5 analyzed conventional deposits increased to almost 50 basis points (bps) until the end of the third quarter above the baseline after 100 basis points or one standard deviation positive shock of KIBOR.

Likewise, GDP decreased up to 20 bps after one standard deviation shock of Conventional deposit till the end of the sixth quarter. Whereas Islamic deposits decreased up to 20 bps after receiving 100 bps of the positive shock of KIBOR till the end of the sixth quarter. However, Islamic deposits could not affect GDP significantly because the size was recorded as one-sixth of the conventional deposit until 2018.

Figure 6 examined that conventional investments decreased up to 50 bps above baseline after one standard deviation positive shock of KIBOR till the end of the sixth quarter. In contrast, Islamic Investments does not affect significantly after a one standard deviation positive shock of KIBOR. As regards GDP is not affected by both conventional and Islamic investment significantly. This shows that government borrowings remained on the higher side and could not be affected by monetary tightening.

It is concluded that both Islamic and conventional financing, deposits and investments could not adequately influence aggregate demand which shows an underdeveloped money market in Pakistan.

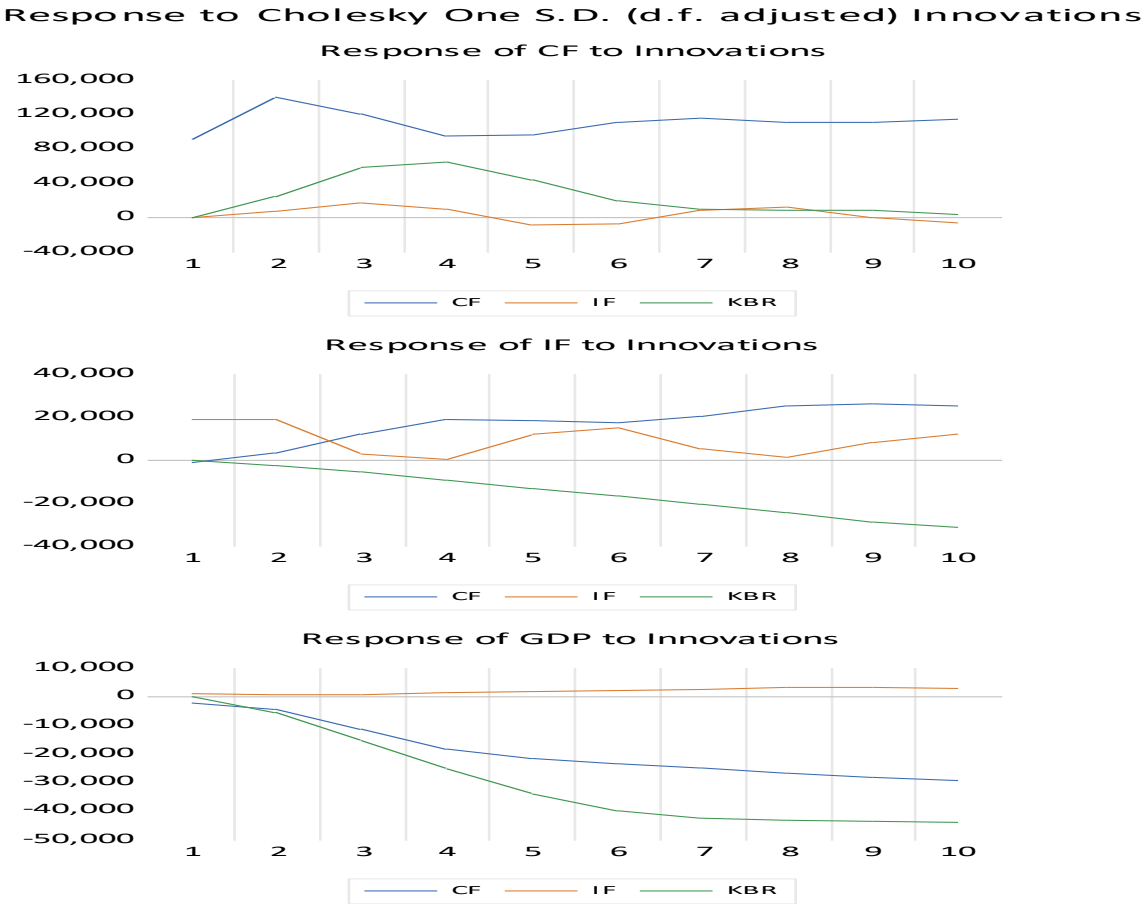

Figure 4: Impulse Response Functions of Financing Side

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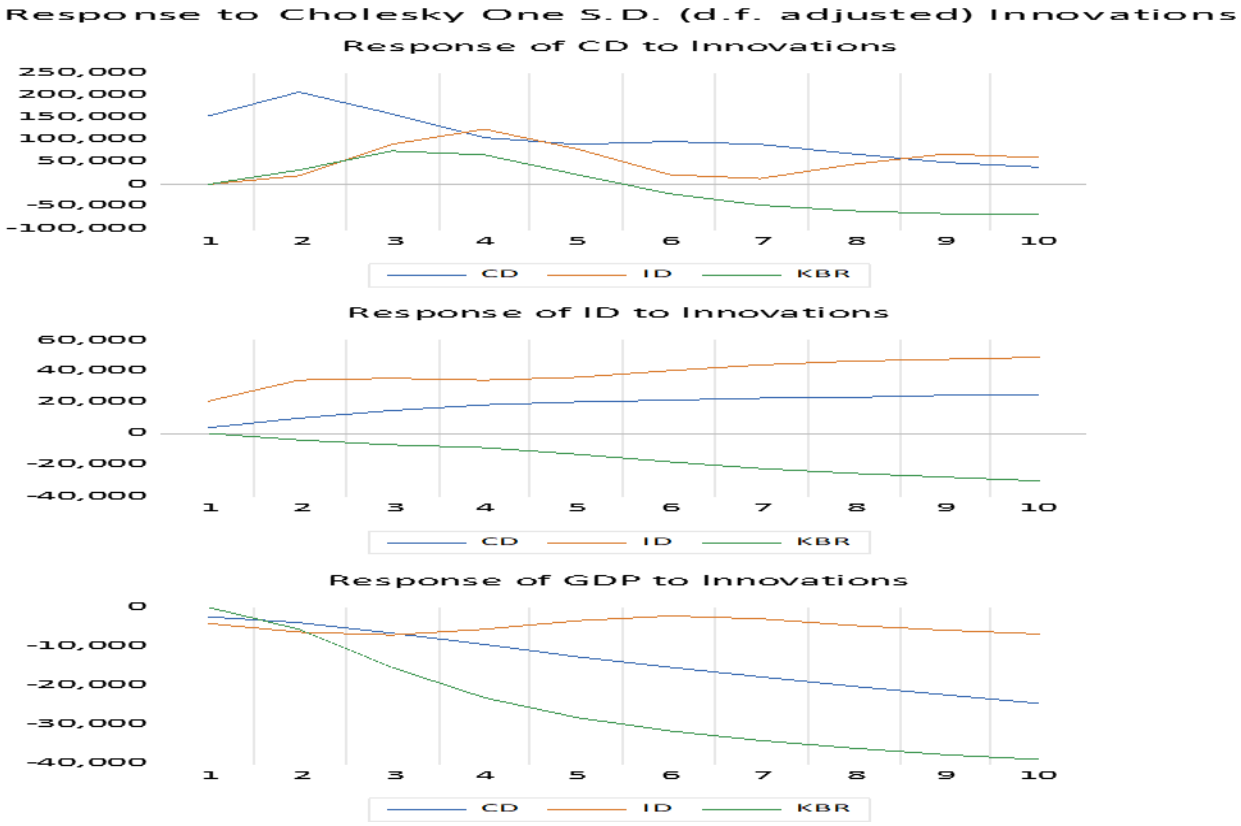

Figure 5: Impulse Response Functions of Deposits Side

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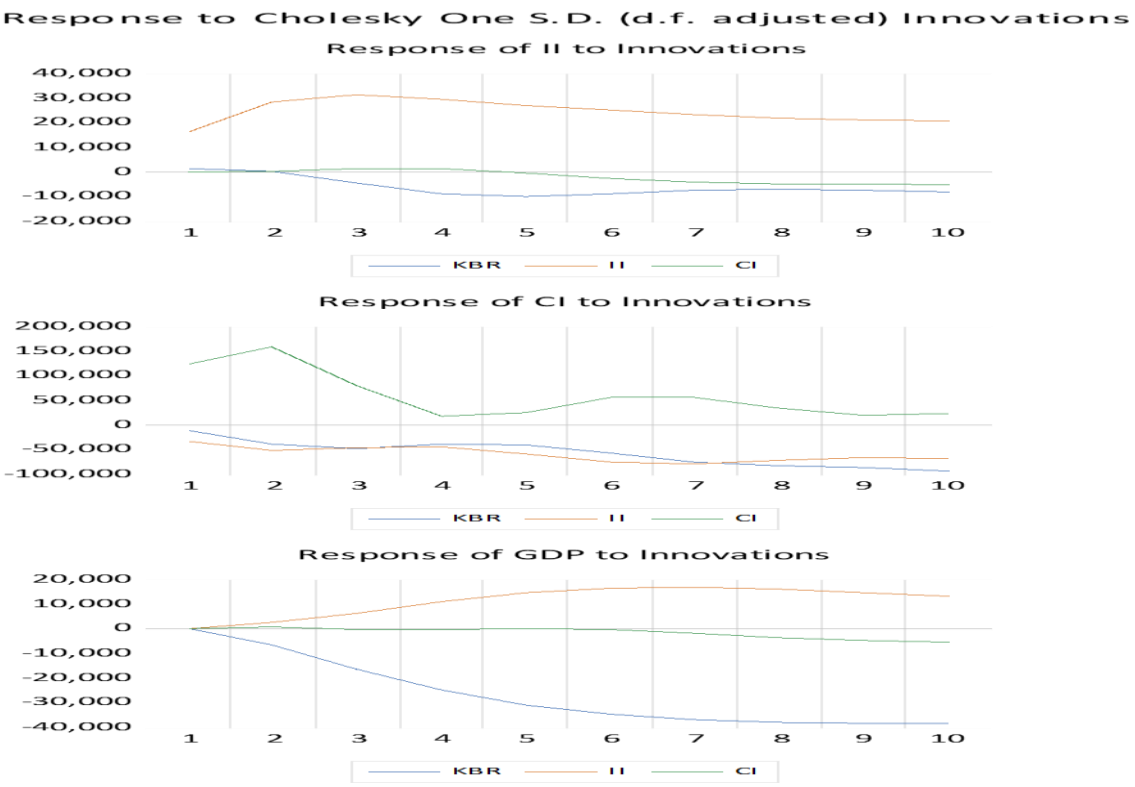

Figure 6: Impulse Response Functions of Investment Side

Variance Decomposition Analysis

The variance decomposition analysis presented in Table 5 shows that KIBOR contributed more effectively to conventional deposits than Islamic deposits. It contributed almost 8 per cent till the end of eighth quarter whereas for Islamic deposit it contributed almost negligibly as less than 1 per cent after eighth quarter. GDP is affected by conventional deposits more vibrantly than Islamic deposits at 25 per cent until the end of the eighth period.

On the investment side, as shown in Table 6 KIBOR contributed more efficiently for Islamic investments as almost 21 per cent till the end of eighth quarter whereas for conventional investment it contributed less than 5 per cent till the end of 8th quarter. GDP is almost unaffected through investment portfolios.

Results of variance decomposition analysis revealed in Table 7 show that KIBOR contributed more effectively to conventional finance by almost 9 per cent until the end of the eighth quarter; however, it contributed 6 per cent to Islamic finance. As a result, GDP is affected by 23 per cent by Islamic financing and 19 per cent by Conventional financing. These results should be read in conjunction with the above results generated through impulse responses to clarify the cause and effect of interest rates on banking portfolios.

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Table 5: Variance Decomposition Analysis of Conventional vs Islamic Deposits

Variance Decomposition of CD:						Variance Decomposition of GDP:					
Period	**S.E.**	**CD**	**ID**	**GDP**	**KBR**	**Period**	**S.E.**	**GDP**	**KBR**	**II**	**CI**
1	0.01	100.00	0.00	0.00	0.00	1	0.00	100.00	0.00	0.00	0.00
2	0.02	99.17	0.00	0.80	0.02	2	0.01	98.72	0.18	0.30	0.80
3	0.02	94.45	4.18	1.21	0.16	3	0.01	96.14	0.09	0.89	2.89
4	0.02	80.14	18.15	1.42	0.30	4	0.02	95.07	0.14	1.28	3.50
5	0.02	72.69	19.36	7.21	0.74	5	0.02	93.20	0.11	1.84	4.85
6	0.02	69.53	14.59	13.58	2.31	6	0.03	92.57	0.14	2.26	5.03
7	0.03	66.79	14.04	14.52	4.65	7	0.03	93.35	0.33	2.09	4.24
8	0.03	60.71	18.11	12.88	8.30	8	0.03	93.46	1.14	1.80	3.61
Variance Decomposition of ID:						**Variance Decomposition of KBR:**					
Period	**S.E.**	**CD**	**ID**	**GDP**	**KBR**	**Period**	**S.E.**	**GDP**	**KBR**	**II**	**CI**
1	0.01	0.46	99.54	0.00	0.00	1	0.50	11.49	88.51	0.00	0.00
2	0.02	0.74	98.58	0.08	0.60	2	0.73	5.66	89.53	0.87	3.94
3	0.03	0.80	98.42	0.22	0.56	3	0.83	4.38	89.90	2.73	2.99
4	0.04	1.10	98.13	0.41	0.36	4	0.90	4.20	84.11	2.36	9.34
5	0.05	1.90	97.17	0.58	0.36	5	1.04	3.95	64.90	4.46	26.69
6	0.06	2.97	96.14	0.56	0.34	6	1.26	2.84	45.15	9.09	42.92
7	0.07	3.80	95.42	0.50	0.29	7	1.44	2.41	34.40	11.61	51.59
8	0.07	4.27	95.08	0.42	0.24	8	1.56	3.90	29.43	11.90	54.77

Table 6: Variance Decomposition Analysis of Conventional vs Islamic Investments

Variance Decomposition of GDP:						Variance Decomposition of II:					
Period	**S.E.**	**CD**	**ID**	**GDP**	**KBR**	**Period**	**S.E.**	**GDP**	**KBR**	**II**	**CI**
1	0.00	3.90	0.44	95.66	0.00	1	0.06	0.08	7.35	92.56	0.00
2	0.01	13.61	0.55	83.81	2.02	2	0.11	0.22	11.56	88.21	0.01
3	0.01	20.26	0.29	77.29	2.16	3	0.15	0.21	18.00	80.15	1.64
4	0.01	23.03	0.17	72.25	4.55	4	0.19	0.14	20.29	74.87	4.70
5	0.01	26.45	0.30	66.18	7.07	5	0.23	0.41	19.90	74.75	4.94
6	0.02	27.29	0.72	64.78	7.20	6	0.25	0.42	19.30	75.71	4.57
7	0.02	27.59	0.65	65.22	6.54	7	0.29	0.33	19.96	74.93	4.78
8	0.02	27.40	1.55	64.39	6.66	8	0.32	0.28	21.66	72.83	5.23
Variance Decomposition of KBR:						**Variance Decomposition of CI:**					
Period	**S.E.**	**CD**	**ID**	**GDP**	**KBR**	**Period**	**S.E.**	**GDP**	**KBR**	**II**	**CI**
1	0.61	0.04	12.63	15.89	71.44	1	0.02	0.27	1.49	22.73	75.51
2	1.01	1.68	20.02	12.27	66.04	2	0.05	2.14	5.54	28.59	63.73
3	1.31	1.86	24.96	12.31	60.87	3	0.05	4.89	5.93	27.65	61.53
4	1.48	1.47	23.99	16.56	57.99	4	0.06	7.72	6.59	26.00	59.69
5	1.59	1.35	20.87	20.84	56.94	5	0.06	12.41	6.91	24.45	56.23
6	1.67	1.31	19.76	23.42	55.52	6	0.06	18.32	6.22	23.45	52.01
7	1.73	1.24	19.88	24.97	53.91	7	0.07	24.67	5.36	21.37	48.60
8	1.79	1.28	20.81	25.31	52.60	8	0.07	30.93	4.56	19.12	45.39

Table 7: Variance Decomposition Analysis of Conventional vs Islamic Financings

Variance Decomposition of D(GDP):					
Period	**S.E.**	**D(GDP)**	**D(KBR)**	**D(CF)**	**D(IF)**
1	0.004738	100	0	0	0
2	0.005058	96.12996	3.407361	0.276368	0.186306
3	0.005539	82.94813	3.285949	7.201392	6.564524
4	0.006251	68.86766	13.37556	10.29477	7.46201
5	0.007003	58.07105	13.54447	13.66438	14.72009
6	0.007664	48.69112	11.31655	17.69064	22.30169
7	0.007844	46.50421	10.8625	19.19288	23.44041
8	0.008015	44.78693	12.51089	19.3433	23.35888
Variance Decomposition of D(KBR):					
Period	**S.E.**	**D(GDP)**	**D(KBR)**	**D(CF)**	**D(IF)**
1	0.674176	6.356881	93.64312	0	0
2	0.74733	5.346452	89.3343	0.058771	5.260479
3	0.759045	5.364023	86.61045	0.272131	7.753396
4	0.795255	5.702719	82.66227	1.189594	10.44542
5	0.812528	6.607409	79.77721	1.652532	11.96285
6	0.820927	7.742106	78.45043	2.088149	11.71931
7	0.835549	8.284011	76.67482	3.099766	11.9414
8	0.840747	8.837423	75.87455	3.11448	12.17354
Variance Decomposition of D(CF):					
Period	**S.E.**	**D(GDP)**	**D(KBR)**	**D(CF)**	**D(IF)**
1	0.011379	0.629451	0.008514	99.36204	0
2	0.014716	0.540827	5.489891	93.63418	0.335098
3	0.015971	0.718967	8.242093	85.50965	5.529289
4	0.016853	0.740545	7.600805	82.7259	8.932745
5	0.017163	0.814885	7.344683	83.19756	8.642867
6	0.017476	0.857691	7.733678	83.06726	8.341367
7	0.01771	0.876056	9.127149	81.33514	8.661654
8	0.017792	1.103357	9.701297	80.58745	8.607899
Variance Decomposition of D(IF):					
Period	**S.E.**	**D(GDP)**	**D(KBR)**	**D(CF)**	**D(IF)**
1	0.018061	0.032051	0.432765	1.954636	97.58055
2	0.022539	2.522193	0.503064	1.877545	95.0972
3	0.026518	4.819827	1.353417	21.14301	72.68374
4	0.028723	4.487224	2.685418	28.63054	64.19682
5	0.029849	4.490019	4.898735	26.91402	63.69723
6	0.030254	4.652498	4.904832	26.78596	63.65671
7	0.030901	4.459767	5.755877	27.4681	62.31625
8	0.031135	4.551073	6.110763	27.37884	61.95933

CONCLUSION AND RECOMMENDATIONS

Contradictory evidence is derived after analyzing the results produced by banking portfolios of both conventional and Islamic banks. Islamic banking has been rapidly growing and dividing the money market into two groups; however, the size of Islamic banks are still relatively small. The results produced by this study showed an increase in deposits retained by conventional banks; however, deposits maintained by Islamic banks decreased after monetary tightening. Loans given by conventional and

Islamic banks showed less significant responses towards monetary tightening, irrespective of the theoretical underpinnings of lending channels. This under response indicates the underdeveloped financial markets of Pakistan.

The investment side is represented by government borrowings from banks against government securities such as treasury bills and investment bonds which are considered safe avenues for banks to park excess liquidity. These securities also assist banks in maintaining desirable liquidity ratios, i.e. Capital Adequacy Ratio (CAR) and Statutory Liquidity Requirement (SLR) enforced by the central bank. (Committee, 2010). Our study revealed that investment for conventional banks increased in the long run after monetary tightening. On the other hand, for Islamic banks central bank has no regular arrangements to provide sharia complied government security known as Sukuks; therefore, Islamic banks could not show a competitive response and had to hold excess liquidity. Our study concludes that investment portfolios of conventional banks are used to influence aggregate demand in Pakistan in support of Keynesian economics (Keynes, 2018).

Results derived from this study can be used as guidance to consider the typical response of Islamic banks towards monetary shocks and emphasize that the stability of the Islamic banking segment is equally important as their conventional counterparts to achieve effective monetary transmission. However, the existence of two independent financial systems may enhance arbitrage problems that can deteriorate the response of economic variables toward monetary shocks. Therefore, the central bank may consider Islamic financing as an alternative channel for monetary transmission because this channel is as active and vibrant as its conventional counterpart.

This study supports the existence of Displaced Commercial Risk (DCR) in the system. Islamic banks confront DCR for being competitive by rendering better rates than actual to its deposit holders, squeezing profit margins for their equity holders. Similarly, religious beliefs also motivate people to invest that part of their money in profit-making saving accounts offered by Islamic banks rather than to keep in non-remunerative current accounts of conventional banks.

Similarly, the spillover effect of the interest rates on the Islamic banking segment may weaken the viability of Islamic philosophical views. Therefore, monetary authorities should design an appropriate monetary policy that may cater for both banking systems. Moreover, other misconceptions develop in society when conventional counterpart uses similar terminologies in Islamic banks to call interest rate as markup, which enervates the religious view that existed for Islamic banking exclusively.

Islamic banks have limited avenues for parking their excess liquidity, which can lay a foundation for the Islamic money market to facilitate the liquidity problem of Islamic banks. It is efficiently being managed on the conventional side through the central bank. Further digitisation of the treasury market is also required by Islamic banks, such as by evolving electronic Murabaha and other modes of Islamic finance so that the government may equally manage the strength of Islamic banks. The government may develop a dual monetary system and introduce pricing mechanisms for Islamic banks separately by introducing sharia-compliant monetary policy instruments to enhance Islamic share in the overall financial plan. Further, a limited number of Sharia advisors who are simultaneously equipped with financial knowledge in another handicap in sharia-compliant product development.

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