

CAPITAL UNIVERSITY OF SCIENCE AND  
TECHNOLOGY, ISLAMABAD



**Impact of Monetary Policy on  
Bank Lending Channel in Dual  
Banking System: Evidence from  
Pakistan**

by

**Tanzila Nawaz**

A thesis submitted in partial fulfillment for the  
degree of Master of Science

in the

**Faculty of Management & Social Sciences**

**Department of Management Sciences**

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*Dedicated to my lovely parents and siblings who love, support, encourage and prayed for me. My teachers, friends and relatives who always helped me to achieve my academic goals.*



## CERTIFICATE OF APPROVAL

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## *Abstract*

The study investigates impact of KIBOR and M2 shocks upon both credits and deposits held at Islamic and conventional banks in Pakistan. The results of the study are based on Vector Autoregressive Model for the period of 2007:Q1 to 2017:Q4. Impulse response function reveals that sensitivity of depositors of Islamic bank to KIBOR and M2 changes is greater than the conventional banks depositors. Monetary policy affects the depositing and lending behavior of both Islamic and conventional banks. Our results focus on the response of credits and deposits to monetary shocks in dual banking system. The results reveal that deposits and credits of both conventional and Islamic banks respond to the monetary shocks. The hypotheses of the study are accepted that monetary policy has an impact on lending and depositing behavior of Islamic and conventional banks in Pakistan and Islamic banks are more responsive to monetary shocks. Deposits held in the conventional banks increased with an increase in KIBOR. On the other hand, increase in KIBOR negatively affects the deposits held in Islamic banks. The KIBOR negatively affects the credits of conventional bank and Islamic banks.

**Keywords:** Islamic Banks, Monetary Policy, M2, Deposits, Credits.



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# Abbreviations

<b>ADF</b>	Augmented Dickey-Fuller
<b>CRE</b>	Credits
<b>DEP</b>	Deposits
<b>FDI</b>	Foreign Direct Investment
<b>IFRs</b>	Impulse Response Functions Deposits
<b>KIBOR</b>	Karachi Interbank Offering Rate
<b>M2</b>	Money Supply
<b>PKR</b>	Pakistani Rupee
<b>PLS</b>	Profit –Loss sharing
<b>PP</b>	Phillip-Peron
<b>PSX</b>	Pakistan Stock Exchange
<b>QRCs</b>	Quarterly Reports of Condition
<b>SBP</b>	State Bank of Pakistan
<b>SMEs</b>	Small Medium Enterprises
<b>VAR</b>	Vector Auto-Regressive
<b>VDC</b>	Variance Decomposition

# Chapter 1

## Introduction

This chapter includes theoretical background, research gap, problem statement, research objectives, research questions, overview of banking system, and significance of the study. It also explains the plan of this study.

### 1.1 Background of the Study

The lending channel of bank proposed that during adjusting the supply of reserve through open market operations, central banks have the ability to control banking sectors to lend. Open market operations consume reserves and deposits of central banks from the banking system on the contractionary monetary policy. Credit's bank supply will decrease, if banks are unable to compensate the deposit withdrawal ([Aysan, Disli, Duygun, & Ozturk, 2017](#)). While the spillover chain of banks is well known for changing size, liquidity and capitalization ([Ashcraft, 2006](#); [Kashyap & Stein, 2000](#)) there are not enough evidence on how the transmission mechanism of different forms of banks works. To study the transmission mechanism is important for different forms of banks that may impacts the bank lending channel differently ([Aysan, Disli, & Ozturk, 2018](#)). It is significantly important to find out that how effectively the level of deposits and bank credits influenced by central banks. This research empirically compares the lending channel of banks in dual banking system wherever conventional and Islamic bank operates beside.

This lending channel joints the creditors and customers behavior in transmission mechanism that enables to understand various behaviors of these customers and creditors in these banking systems.

Islamic and conventional banks justify same part of intermediary but basic ethics of Islamic banking differentiate the Islamic banks customers from conventional banks (Aysan et al., 2018). From customers point view, Islamic banks attracts religiously motivated people into a system for contribution in financial presence (Kumru & Sarntisart, 2016). Islamic banks represented morally attractive alternative for such customers whose religious beliefs motivated their financial preferences. Customer's behavior and choices are the major determinant of religiosity regardless the individual's religion is also attached (Wilkes, Burnett, & Howell, 1986; Essoo & Dibb, 2004). Miller and Hoffmann (1995) states that, at individual level there is a negative relation between attitude and religiosity toward risk. Likewise, Hilary and Hui (2009) found that high level of religiosity tends to show lower level of risk that is measured by the returns variances on equity and assets of firms located in US region. Similarly, Abedifar, Molyneux, and Tarazi (2013) argued that Islamic bank's depositors response is higher towards macroeconomic shocks and bank performance, it also show higher risk of withdrawal than the conventional correspondents.

In banks point of view, either having religious affiliation or not, willingness to credit supply will be influenced. Islamic banking system works on numerous distinctive financial models and contracts but portfolio of both types of banks' customers is greatly varied. Recent researches proposed that weight of conventional banks on collateral during their credit allocation decisions is greater than Islamic banks (Aysan, Disli, Ng, & Ozturk, 2016; Shaban, Duygun, Anwar, & Akbar, 2014). SME sized enterprises sector of market appears to face the credit restrictions from this practice because of their opaque nature (Carpenter & Petersen, 2002). Furthermore, Islamic banks creates the use of mudarbaha contracts in which on the behalf of customer bank buy a product and resell it to the same customer with original cost plus markup. So, SMEs may be more attracted by Islamic banks because they considerably relieve the requirements of collateral. On



the other hand, in dual banking system, conventional banks' relation is stronger with larger firms who have hard information and generally these banks are more established houses. In banking system, Islamic banks hold marginal shares and might fulfill the credit demand of SMEs by depending on soft information. In banking sector, Islamic banks also did not grasp a significant place which triggers them to grasp the available target in SMEs market. Previous studies in Turkey [Aysan et al. \(2016\)](#) and Indonesia [Shaban et al. \(2014\)](#) illustrate that to finance SMEs, Islamic banks have significantly higher willingness than conventional banks. Furthermore, evidence shows that small businesses are more uncovered by monetary and economic shocks ([Berger & Udell, 2002](#); [OECD, 2012](#)), so argue cannot be wrong that sensitivity of economic and monetary shocks is higher in lending of Islamic banks.

## 1.2 Overview of Pakistan Banking System

Pakistan's central bank is the State Bank of Pakistan that built-in by the State Bank of Pakistan (SBP) Act, 1956. SBP Act, 1956 gives the authority to banks to operate as a country's central bank. The SBP Act permits to the banks to increase the growth in the way to securing the monetary stability, to control and regulate the credit and monetary system and complete utilization of productive resources of Pakistan. Developmental and traditional functions perform to achieve the macroeconomic goals of SBP. The traditional functions perform to issue notes, to regulate and supervise the financial system, banker of Government, behavior of monetary policy and other agency functions like managing foreign exchange, managing public debt, on policy matters advising to the Government and also have to maintain close relationships with international financial institutions. Developmental function performed by SBP includes financial framework's development, provision of credit to priority sectors, and institutionalization of savings and investment. For development and smooth running of any nation's economy banking sector plays the essential role.

In 20th century, worldwide, the financial sector was working on the basis of interest. Interest based banking sector contradicting the injunction of Islam whereas the large amount of world's population (Muslims) conflicting with the existing system, which lead them to develop the interest free (Shari'a compliant) banking system. So, the SBP plays a dynamic role in Islamization process of the banking system.

In 1980s, efforts were started for Islamization of economy in Pakistan. By Council of Islamic Ideology, the very first report on Islamization of economy was also issue in 1980s. The whole financial system was quickly converted into interest free system that resultant in failure of true Islamic banking practices just because of human resources incapability. In 1999, higher judiciary declares the in practice system as Shari'a non compliant system. In 21st century's start, SBP starts comparable working in Islamic and conventional banking by adopting different approaches than early 80s. In addition, Pakistan's first Islamic bank was established for Islamic financial products in 2002 to response to the market demand. Islamic banks designed and offered appropriate contracts to households and other enterprises to collect deposits and extend credits. As a new established banks entered in the market Islamic banks observed the growth sharply. In June 2011, there were developed five Islamic and twelve conventional banks in Pakistan with independent Islamic divisions that was covering 8% of market shares.

According to [Zaheer, Ongena, and Van Wijnbergen \(2013\)](#), Asian countries like Bangladesh, Indonesia, and Pakistan experiencing an extraordinary increase in Islamic finance and many Western countries are facilitating Islamic banking. In 2010, the total estimated amount of Islamic finance was more or less \$1 trillion. Conventional banks comprise the 74% that is the largest share, 10% by investment banking account and the remaining part that is 16% consist on sukuk (Islamic bonds) and takaful (Islamic insurance). In 2009, assets of largest 500 Islamic banks increased by 29% to 822 billion ([Zaheer et al., 2013](#)). The number of financial institutions deleveraged their positions just because of the rest world's financial system contradiction. The main reason of this development was that Islamic banking system beliefs to do interest free sale of debt instruments. Though,

Islamic banks provide their funds to such projects that are not permitted in Islamic shari'a or not Haram. Islamic banks not lend their funds to those who contract with Interest payments, alcohol, pork, gambling, or garrar (excessive uncertainty). Furthermore, in lending, Islamic banks are more conservative. For that reason, Islamic banks did not allow to charge the interest or invest in derivatives and securities etc or such type of mechanism that is affected in the financial crises. The main point in the quick growth leads to academic and policymakers in this aspect that when Islamic sector of the banking system become more important than the transmission of monetary policy changed in strength by lending channel of banks. Central bank can affect the strength of the bank lending channel as it significantly depends upon the central bank's ability to affect supply of bank loan like banks not considering the decided loans and securities as a substitute or may not attract deposits completely.

On the other hand, Islamic banks might be reluctant to buy the deposits at a fixed rate or their investors do not consider their Islamic loans as a substitute. Consequently, it makes the effective shocks of monetary policy transmission through Islamic sector of the banking system. For religious reasons, Islamic banking sector especially attracts depositors and borrowers for interest free deposits and credits (Baele, Farooq, Ongena, et al., 2012; A. K. Khan & Khanna, 2010). Islamic banking is based on PLS on both side of balance sheet (assets and liability) of banks. In other words, Islamic banking is based on equity not on fixed interest. Islamic banks depositors are the shareholders who shares the profits and losses of banks and don't have any guarantee for the face value of their deposits. According to Cowen and Kroszner (1990), conventional mutual fund banks are different from Islamic banks. The main sources of funding in Islamic banks are Investment accounts and transaction deposits but conventional banks' demand deposits and transaction deposits are almost similar, and may be withdrawn cash at any time by using ATM or check. The contractual and motivational features allow to Islamic bank to defend them self from monetary shocks as a result Islamic banks and conventional banks differently transmit monetary policy (Zaheer et al., 2013).

In Pakistan context, the transmission mechanism of monetary policy is the process in which monetary policy changes affects the inflation and aggregate demand. This monetary transmission mechanism has these five channels; exchange rate, interest rate, assets price, expectations, and balance sheet channel.

Interest rate channel refers to the mechanism through which it influencing the retail interest rates that banks offer on deposits or charge on loans to businesses. The Change in policy rate may influence interest rates of money market like KIBOR that impact the long-term interest rates. For lending to customers and businesses KIBOR is also used as a benchmark. The higher interest rates give confidence to people to save more and consume less and vice versa. Balance sheet channel works through the mechanism in which the financial intermediaries' credit portfolio and other economic agents are affected by monetary policy. Due to lack of funds availability and lesser demand of consumers and business for credit, monetary policy has a tendency to reduce the banks capacity to extend credits. The exchange rate channel links international economies with domestic economies. While, an increase in local currency demand as compared to the demand of foreign currency may lead to lower depreciation pressure on local currency or an appreciation of local currency. Furthermore, changes in interest rate may have a direct affect on inflation that influences the prices of imported goods or services. Assets price channel is linked with price of assets. The returns on bank deposits will increase than return on investing in other assets by increase in interest rate.

### 1.3 Gap Analysis

Islamic banking system has emerged the same as workable complementary scheme after occurrence of the global financial crises in banking system worldwide. Correspond to the growing Islamic banking sector's visibility; wide range of research efforts are in the result of growing academic attention. According to (Samad et al., 1999; Abdul-Majid, Saal, & Battisti, 2010) various studies paying attention on the efficiency differences among conventional and Islamic banks, whereas other

focused on documented operational differences between them (Ibrahim, 2016; Daher, Masih, & Ibrahim, 2015; Demirguk-Kunt, Beck, Merrouche, et al., 2013). One more side of research has sightseen the Islamic banks flexibility with the global financial crisis outbreak of 2008 (Čihák & Hesse, 2010; Abedifar et al., 2013; Hasan & Dridi, 2011; Rajhi, Hassairi, et al., 2013). Other studies growing literature that studied the several transmission mechanism and monetary policy impact in dual banking environment, such as (Zulhibri, Sukmana, et al., 2016; Sukmana & Kasim, 2010) study the behavior in the process of monetary transmission of Islamic banks in Malaysia and Indonesia. To conclude these studies, in the monetary transmission, Islamic financial institutions play a significant role.

These studies have been investigated extensively in literature of financial economics on monetary policy. The largest part of the studies focuses on analyzing efficiency differences and documented differences among conventional and Islamic banks. However, there exists a contextual gap that the monetary policy's impact on depositing and lending behavior of banks of Pakistan is still untouched. Moreover, with the passage of time if it's becoming the part of emerging markets there is an interest of people then the insight of this phenomenon can be increased. So this research provides a gateway to future researchers in a new domain.

## 1.4 Problem Statement

In previous studies, most of the researchers showed that on willingness to supply of credit religious affiliation has an influence. Most of the studies focus on analyzing efficiency differences and documented distinctions between Islamic and conventional banks. Furthermore, the past literature also tells that the differences in responses of banks to monetary policy across types of banks, bank size, and liquidity. The past literature also tells that in the monetary transmission Islamic financial institutes play a significant role. Information about the efficiency differences and operation differences is available but the evidences on the response to monetary policy are exclusive especially in Pakistan context. So, the debate on the response of the monetary policy is still unexplored.

## 1.5 Research Questions

The study has research questions as follows:

### Research Question 1

How monetary policy impacts the depositing and lending behavior of Conventional and Islamic banks in Pakistan?

### Research Question 2

Are Islamic banks more responsive than conventional banks?

## 1.6 Research Objectives for This Study

Objectives of the study are as follows:

### Research Objective 1

To examine the impact of monetary policy on deposits and lending behavior of conventional and Islamic banks in Pakistan.

### Research Objective 2

To examine that whether Islamic banks are more responsive than conventional banks.

## 1.7 Significance of the Study

The main reason to conduct this study is to examine the transmission of monetary policy in conventional and Islamic banks in Pakistan. Later on, by conducting additional exercises, this study will give in detail explanation of observed differences and investigate the possible reasons for those differences. It is important to studying the transmission mechanism for different types of banks that could have different impacts on bank lending channels (Aysan et al., 2018). It is significantly important to find out how effectively central banks influences the level of

bank credits and deposits. This research empirically compares the bank lending channel in dual banking system of conventional and Islamic banks. This lending channel joints the creditors and customers behavior in transmission mechanism that enables to understand various behaviors of these customers and creditors in these banking systems.

This study will contribute to literature in different aspects such as investigates the differences linked with conventional and Islamic finance (BinMahfouz & Hassan, 2012; Abdelsalam, Fethi, Matallín, & Tortosa-Ausina, 2014). While researches that investigating the Islamic banks role in transmission process of monetary policy is very limited but the monetary shocks' influence on conventional banks is frequently studied. Study focus on the change in lending and depositing behavior as a response to monetary shocks in conventional and Islamic banks. Over thirty years, conventional and Islamic banks operate side by side and Pakistan presents them a fertile testing ground. Subsequent, Islamic bank permitted by government initiatives to enlarge the business activities. Particularly, in the last decade, the regulations and reforms have removed some biased regulations effectively in opposition to Islamic banks. The dual banking system of Pakistan allows the researchers to accomplish a comparative study on the impact of monetary policy shocks between conventional and Islamic banks that's why, deficiency in different regulatory behavior guide us to feature any different response to behavioral and operational differences between conventional and Islamic system.

## 1.8 Organization of the Study

Chapter two explains the literature review from the past literature and research hypothesis. Chapter three is about data sampling, description of variables and econometric models of the study. Chapter four covers the data analysis, and explanation of empirical results. Chapter five includes conclusion, recommendations and limitations of the study.

# Chapter 2

## Literature Review

This chapter explains the theoretical arguments from the past studies and built the hypotheses for this study on the basis of those arguments.

This study examines the response of credits and deposits of banks to change the attitude of monetary policy. In conventional banks point of view about lending, in economy, banks play the special role not by issuing the bank deposits and credits that contributes to large monetary collection but also by holding bank loans and assets for which there exists the close substitutes. Bank lending channel models and theories put an emphasize on that, the major resource are the deposits of funds for lending of many banks especially for small banks and bank loans are the main source of funds for investment of many firms especially for small firms. The effect of monetary policy is divided by (Keeton et al., 1993) into indirect effect and direct effect on bank lending behavior. The change in bank lending due to reason of change in reserve requirement of bank is a direct effect. The change in bank lending due to the reason of financial assets relative earning rate because of the money supply change is the indirect effect. Furthermore, affecting capital adequacy ratio and emergency liquidity, monetary policy is able to change the bank lending behavior.



## 2.1 Monetary Conditions

There was an extensive capital inflow after 9/11 in Pakistan. Remittances of workers increased tremendously especially from UAE, Saudi Arabia, UK and US. Encouragement was boomed by privatization of major public sector corporations and foreign direct investment (FDI) by Government of Pakistan.

As a result of increase in inflow of FDI and remittances, there was an appreciation in Pakistan rupee (PKR), the local currency, against some other currencies. Foreign capital inflow was welcomed because in foreign reserves, Pakistan faced severe shortage before 2001 due to the nuclear tests in 1998 ([Khwaja & Mian, 2008](#)). To foreign funds inflow, the SBP reacted by increasingly gathering these funds and other foreign funds and by purchasing the US dollars. The objective was to control the rupee appreciation to protect the Pakistani exports competitiveness. The inevitable cause to remove the increase in money supply by the government securities' open market sales and to expand the money supply was dollar purchased by SBP. Consequently, government securities interest rate fall down to 1.27 percent in August 2003 and Pakistan's financial market became saturated due to surplus of liquidity. After 2005, the response of monetary policy was started tighten to inflation.

Monetary policy responds to these large and unique external shocks during the analyzed period like FDI, remittances etc. The analysis of the study of [Zaheer et al. \(2013\)](#) relies on the Treasury bill rate changes as an indicator of policy rate. The results are similar by replacing the overnight interbank offering rate's changes with six month Treasury bill rate's changes or with three month interest rate changes ([Zaheer et al., 2013](#)).

## 2.2 Islamic Banks

On both sides of balance sheets of banks, Islamic banking system is equity based with the PLS instead of fixed interest rate based. The depositors are shareholders of Islamic banking who have no guarantee against their deposits' face value and

share fully profits as well as loses of the banks. Correspondingly, on the balance sheet's assets side, banks place operational leases, deferred sales, and arrangements of PLS to firm investment or finance household consumption. Islamic banks are similar to mutual funds of conventional banks in many aspects (Cowen & Kroszner, 1990).

The sources of funding in Islamic banks are investment accounts and transaction deposits. Investment accounts of Islamic banks are similar to time deposits plus saving accounts of conventional banks. These accounts involve PLS among depositors and banks instead of offering the fixed interest rate but the investment deposits face value is not ensured. The transaction deposits of Islamic banks and demand deposits of conventional banks are almost similar. However, in Islamic banking, funds cannot be lent to Haram projects i.e., projects related to alcohol or that deal with gambling, Riba (interest payments), or uncertainty (Garrar).

The most righteous form of financing firms and households is joint venture financing. In starting of development of Islamic banks, to finance the household consumption, real estate, Ijara (Operational leases), Murahaba (deferred payment sales), car purchase etc they adopt fixed asset backed return arrangements. Almost 80 percent of total financing was covered by these two types of funding of Islamic banks that decreased to 60 percent over time in Pakistan.

Government security's absence was the main problem faced by Islamic banking system. Islamic banks do not had any base rate at initial basis to price the Ijara and Murahaba contract due to the absence of Islamic government security and they use KIBOR. Short term government securities rate like three month Treasury bill rate determines the KIBOR. The great part of financing provided by Islamic banks is covered by fixed return approach so; three month Treasury bill rate might be used to indicate the monetary policy stance to estimate the strength of lending channel.

## 2.3 Bank Lending Channel in Pakistan

There is structure of banking system of country to find out the strength of bank lending response to the shocks of monetary policy. On supply of bank credits, domestically operating banks' foreign ownership and State also plays an important role to determining the impact of monetary policy. To compensate the monetary contraction's impact publicly guaranteed banks that are owned by state attracts new funds (Ehrmann, Gambacorta, Martinez-Pagés, Sevestre, & Worms, 2003). There are some features of Pakistan banking system, like market structure, within the corporate finance and financial system the importance of banks, the role of state and overall performance of in banking system, heterogeneity of banks etc.

Bank level credit ceilings, high government borrowings, directly controlled interest rates and subsidized and directed loan supply characterized the financial system of Pakistan in 1990s, before the financial reforms. In 1970s, the bank's public ownership was introduced and ended by making the dominant to state in banking sector in early 1990s. There was no domestic private bank in 1990.

The deposits are not insured in Pakistan because by the regulatory authority deposits insured indirectly by the constant supervision. Uncertainty about deposit's nominal value makes to feel unsafe to depositors about their money that's why lending channel may become more effective in deposit insurance's absence. As a result, banks obligated to cut lending and deposits are withdrawn by tightening the monetary policy.

## 2.4 Impact of Monetary Policy on Bank Lending Channel

Under the two conditions, monetary policy has an effect on the economy through conventional lending. The first condition is the banks are special and the second is limited financial resources for banks. The banks are special means that for some class of borrowers banks don't have perfect substitutability of bank loans,

limited financial sources means imperfect substitutability of deposits. According to these conditions, banks should have to view the securities and loans as imperfect substitute on the asset side of the balance sheet. Hence, the supply of bank loans reduces if there is a reduction in money supply. Furthermore, bank credits and other financing sources have to be imperfect substitute for firms. Consequently, changes in the bank credits supply affect the spending decisions on firms. For small and medium enterprises, it may be true because they cannot get funding easily by issuing securities to investors. ? (?) in their study argue that reserves uses gradually when there is an increasing policy rate in banking system. A deposit shock generated as a result of change impact of bank lending monetary policy. However, it is pricey and suitable to balance the withdrawn deposits by using other sources and bank also adjust their lending accordingly.

In theoretical viewpoint, Islamic banking is differing from conventional banking because of Riba (interest) that is not allowed in Islam. In shariah compliance, the Riba cannot be charged on credits and the rate of return cannot be fixed on deposits. Islamic banking system's actual adoption about the usage of rate of return as a substitute of interest rate may be divided into two thinking streams. The first stream is to reflect the true and ideal form of Islamic banking, the literature try to look the main concepts of Islamic banking from an ideal point of view like, money, PLS, profit and interest. However, the second stream that explored in literature is that banks have a propensity to adopt mark up based, more realistic and less risky Islamic banks contract version than PLS paradigm. In the framework of monetary policy, Islamic bank is a complex task. It is complex not only for the reason of monetary policy framework of countries and heterogeneity of financial systems but also due to the need of core principles of Islamic finance and shariah compliance ([Khatat, 2016](#)).

It is not clear that how transmission mechanism works for Islamic banks. Ideally, the Islamic banking operation not supposed to be linked with interest rates to see the effectiveness of transmission mechanism among Islamic banks. As, the prohibition of interest is the main pillar of Islamic banking, so priori proposition have to recommend that depositors of Islamic banks are not sensitive to changes

of policy rate. According to [Aysan et al. \(2017\)](#); [M. S. Khan and Mirakhor \(1989\)](#) the functions of Islamic banks are similar to equity based companies and their depositors are treated as quasis shareholders. In this type of business models, Banks share the profits with depositors as per stated rate of return that is pre agreed. In Islamic financing, the ideal model is based on PLS. This model may possibly suggest that the tools function in conventional monetary policy should not function in Islamic banks. While, prohibition of *riba* is the main pillar of Islamic banking, but still on the several grounds monetary transmission mechanism operates in these banking system.

First, According to [A. K. Khan and Khanna \(2010\)](#) differing to the proposition of PLS model, mostly current Islamic banking practices knowing as these practices are not relying on non PLS model. To be sure, [Cevik and Charap \(2015\)](#); [Dar and Presley \(1999\)](#); [Chong and Liu \(2009\)](#) in their empirical study suggest that the rate of Islamic deposits is closely fixed to the conventional deposits rate. The study of [Alam and Parinduri \(2017\)](#) investigates many possible grounds why most of the Islamic banks choose non PLS instruments that was opposite to the knowledge of Islamic finance like Islamic finance suggests risk sharing. Poor contracting environment was one of the main reason that hypothesized, they explore that either with the increasing quality of contracting environment instruments Islamic banks shifts or not to PLS instruments. Their findings indicate that the quality of contracting environment not determined the tendency of non PLS instruments of Islamic banks. The study of [Alam and Parinduri \(2017\)](#) conclude that asset preferences of Islamic banks are not likely to be changed by the policies used for enhancing the contracting environment. It is possible that the creditors and depositors of Islamic banks responds to the policy rate change due to the occurrence of products of non PLS and policies' incapability to encourage products of PLS.

Second, it's hard to defend the response to policy rate change because of the argument that Islamic banks depositors are not predictable to leave their banks. While, Policy rate change makes more attractive alternative shariah complaint investment opportunities, so that depositors of Islamic banks reconsider their investment in their banks like, investments in real estate. For this reason, it's difficult

to argue that Islamic banks are not responsive to monetary policy.

Third, after a positive policy rate shock, conventional banks are more successful than Islamic banks to re-establish the deposits level. Islamic banks react more slowly than conventional banks to adjust their deposits interest rate to attract displaced deposits. So, conventional banks found better positioned to quickly adjust the interest rate than Islamic banks. The delay in adjustment may make it difficult for banks to collect proficiently the withdrawn of the deposits. Some religious individuals will always prefer Islamic banks to keep their money by ignoring the policy rate.

Fourth, the lending channel strengthens through these banks because of reduction in the access to non funding deposit source (shariah compliant) of Islamic banks. Islamic banks capacity to compensate the withdrawn deposit reduced when response of deposits to monetary shocks reduced.

At last, Islamic banks favorable attitude is an added reason for why the lending channel of banks amplified through these banks towards largely bank-dependent companies (or SMEs). In demand for credits, SMEs affected more severely than larger firms by monetary and macroeconomic shocks.

In a number of studies, the monetary policy's impact has been examined in dual banking system. [Ito \(2013\)](#) study finds that deposits return in Islamic banks and interest rate in conventional banks moves together in Malaysian banking sector. [Ito \(2013\)](#) explains the findings that there is presence of significant commons in both conventional and Islamic banks. Similarly, according to [Ergeç and Arslan \(2013\)](#), there is a similar impact of monetary shocks on conventional and Islamic bank deposits in Turkish banking system. [Khatat \(2016\)](#) discussed about the main problems for conducting monetary policies. [Khatat \(2016\)](#) study discussed the main problems in such countries where the conventional and Islamic banks exist. Almost all researchers are agreed upon that Islamic banks should take an independent process in conducting a monetary policy after comprising similarities and differences. [Sukmana and Kassim \(2010\)](#) findings raise the significance of Islamic banks in the monetary transmission mechanism in the dual banking system because they suggest the need of formulation of monetary policy in dual

banking system. [Haron and Nursofiza Wan Azmi \(2008\)](#) also underlined the dual policy formulation and in Malaysian dual banking system investigates the impact of chosen economics variables on deposits. They discuss in their study that the role of religious beliefs of depositors in their banking decisions and find that at Islamic and conventional banks deposits responds differently. Although, there are some evidence exists that investigate the relationship between return rates and monetary policy in Islamic banking system but these studies did not investigate the fundamental reasons of why the lending channel of banks operates differently in two distinct banking systems. The study tries to find the understanding the operational differences role and the details of different monetary transmission mechanism between conventional and Islamic banks. On the basis of above arguments and discussion, this study hypothesized that:

H1: There is an impact of monetary policy on deposits and lending behavior in Islamic and conventional banks in Pakistan.

The argument and assumption that Islamic banks are more stable than conventional banks because they are performing an interest free banking and make a positive role in financial stability attainment is partially invalidates ([Ergeç & Arslan, 2013](#)). The unique features of Islamic banks are suggested by the distinct differences in responsiveness to the interest rate shocks. [Caporale, Catik, Helmi, Menla Ali, and Tajik \(2016\)](#) investigates the monetary transmission mechanism of bank lending channel in dual banking system in Malaysia. The results of these studies show that the credits of Islamic banks less responsive to the shocks of interest rate than the credits of conventional banks. On the other hand, [Aysan et al. \(2018\)](#) explains in their study that the credits and deposits of Islamic banks are more responsive to the interest rate changes in Turkey. On the basis of above studies we hypothesize that:

H2: Impact of monetary policy is more responsive in Islamic banks in Pakistan.

# Chapter 3

## Research Methodology

This chapter gives the detail about Population, Sample, Data, and Source of the data from which data is obtained and description of variables. It also explains the adopted methodology for this study.

### 3.1 Data Description

The study compares the conventional and Islamic banks in their responses to monetary policy. The study uses a panel data set of quarterly observations for the period of first quarter 2007 to fourth quarter 2017. Population of the study includes 41 banks listed on Pakistan Stock Exchange (PSX) that are operational in the financial system and have figures of their Quarterly Reports of Condition (QRCs). The study includes all banks that remain listed throughout the period of study and submitted their quarterly reports to State Bank of Pakistan. Sample of the study comprises 6 Islamic banks and 18 conventional banks operating in Pakistan. The data is derived from the QRCs of banks submitted to the SBP that comes from the website of State Bank of Pakistan. The macroeconomic variables Money Supply and Karachi Interbank Offer Rate (KIBOR) come from investing.com.



## 3.2 Description of Variables

### 3.2.1 Deposits and Credits

”Deposits are the money that has been put into one bank or all the banks in a particular area” whereas, ”Credits are the money that a bank lends to a particular customer”. In this study these both variables are used as a dependent variable because this study checks the impact of monetary policy on credits and deposits. In the study of (Aysan et al., 2018), both variables deposits and credits are used as a dependent variable so, in this study these are also used as a dependent variable. Quarterly deposits and credits are used, the amount is in thousands PKR and are log transformed.

$$\text{Dep} = \ln (\text{Deposits})$$

$$\text{Cre} = \ln (\text{Credits})$$

Where,

$\ln$  = Natural Log

### 3.2.2 Karachi Interbank Offer Rate (KIBOR)

KIBOR is the average interest rate that is offered by banks for term deposits (Farlex Financial Dictionary). KIBOR is used as an independent variable because this study wants to check the impact of KIBOR on deposits and credits. In the study of Aysan et al. (2018) policy rate is used as an independent variable. KIBOR is calculated by taking the average of monthly KIBOR to use the quarterly data.

### 3.2.3 Money Supply- M2

Every central bank has a little different definition of M2, all banks include money that currently circulates in country and the money that most likely to come into circulation. In this study, M2 consists on total Physical currency, money market

accounts and amount of money in saving accounts. It is used as an independent variable to check the impact on deposits and credits of banks. The M2 is measured in PKR and log transformed.

$$M2 = \ln (\text{Money supply})$$

Where,

$\ln$  = Natural Log

### 3.3 Econometric Model

#### 3.3.1 Panel-VAR Model

In this study, the impact of monetary policy shock upon credits and deposits of conventional and Islamic banks is analyzed through a panel Vector Auto regression (VAR) model by using quarterly data for Pakistan. The Panel VAR methodology combines the traditional VAR approach which treats all the variables in the system as endogenous. According to the Sims (1980), if there is simultaneity among variables there should not be made any distinction between these variables as exogenous or endogenous. In VAR model all variables should be considered as endogenous because VAR is a simple model where econometrician has no concern as to which variable is endogenous and which is exogenous. All variables in this model are endogenous and each equation can be analyzed separately with Ordinary least square (OLS) method. Asteriou and Hall (2007) states that estimates obtained from VAR model are much better than obtained from any other complex simultaneous equation model.

This study then obtains IRFs to measure the credits and deposits response to monetary shocks in Islamic and conventional banks. The condition of stationary in respect to the variable should be identified through unit root tests to investigate the relationships between employed variables in the study based on IRFs and Variance Decomposition (VDC). Standard VAR analysis is applicable, if the variables are

known as stationary at level. If the variables are known as stationary at first difference e.i I(1) then we search for a co-integration relationship between these variables. A VAR model has to be run with the first difference if variables are not co-integrated (Enders, 2004).

In the panel-VAR methodology, the main assumption is that the variables entering system earlier influence the following variables at the same time and with a lag, whereas the subsequent variables affect the previous variables only with a lag (Love & Zicchino, 2006). This implies that the previously entered variables are more exogenous and the later ones variables are more endogenous. In the Choleski ordering list, the study uses the following variables: Karachi Interbank Offer Rate (Kibor), money supply (M2), total deposits and total credits..

The research used the panel-VAR methodology that extends the traditional VAR approach to a panel setting to control heterogeneity at the bank-level. Since the variables in the system are treated as endogenous in the traditional VAR approach. This study specifies our model as follows:

$$Z_{i,t} = \Gamma_0 + f_i + \Gamma_1 Z_{i,t-1} + \Gamma_2 Z_{i,t-2} + \dots + \Gamma_s Z_{i,t-s} + \epsilon_{i,t} \quad (3.1)$$

In this model, the variables KIBOR, M2, credits and deposits are the elements of a vector Z for bank i at time t in the VAR system. While, the dimension of time of our panel is small, study estimates a one-lag panel-VAR to study the response of creditors and depositors to KIBOR rate changes. In all estimations, this study control heterogeneity for bank-level by incorporating  $f_i$  as proposed by (Holtz-Eakin, Newey, & Rosen, 1988).

Let  $\bar{Z}_{i,m}^k = \frac{\sum_{s=m+1}^{T_i} Z_{i,s}^k}{T_i - m}$  denotes the means obtained from the future values of a variable  $Z_{i,t}^k$ , a variable in the p-variable vector  $Z_i = (z_i^1, z_i^2, \dots, z_i^k, \dots, z_i^p)$  at  $t = m$ .  $T_i$  denotes the last period of data available for a given bank series. Let  $\bar{\epsilon}_{i,m}^k$  denotes the same transformation for  $\epsilon_{i,m}^k$  where  $\epsilon_i = (\epsilon_i^1, \epsilon_i^2, \dots, \epsilon_i^k, \dots, \epsilon_i^p)$ . Hence, we get following variables after Helmert transformation,  $\tilde{Z}_{i,m}^k = \delta_{it}(Z_{i,m}^k - \bar{Z}_{i,m}^k)$  and  $\tilde{\epsilon}_{i,m}^k = \delta_{it}(\epsilon_{i,m}^k - \bar{\epsilon}_{i,m}^k)$  where  $\delta_{it} = \sqrt{\frac{T_i - m}{T_i - m + 1}}$ . The final transformed model is thus given by:

$$\tilde{Z}_{i,t} = \Gamma_0 + f_i + \Gamma_1 \tilde{Z}_{i,t-1} + \Gamma_2 \tilde{Z}_{i,t-2} + \dots + \Gamma_s \tilde{Z}_{i,t-s} + \tilde{\epsilon}_{i,t} \quad (3.2)$$

This transformation fulfills the assumption of orthogonality between lagged regressors and transformed variables. For that reason, study can use lagged dependent variables as instruments and estimate the coefficients by system GMM (Love & Zicchino, 2006). This study estimates the coefficients by the Panel VAR model.

### 3.3.2 Impulse Response Function

Impulse Response Function shows the one time shock to one of the innovations on endogenous variables future and current values. To analyze the monetary shocks (KIBOR and m2) potential effects on credits and deposits, in the system, to show that how each variable responds to individual shocks of other variables, the study generates IFRs for each variable. In IRF, the variable's response to the shock of transmitted from another variable is estimated where shocks to other variables are held constant in the system. To do this, the residuals should be decomposed so that they are orthogonal which can be accomplished by ordering the variables, namely Choleski ordering (Hamilton, 1994).

### 3.3.3 Variance Decomposition Analysis

In VAR, the IFRs show the shock's effect of one endogenous variable on another variable whereas, VDC analysis separates the variation in an endogenous variable into the component shocks to the VAR. Consequently, VDC gives the information about the importance of all random innovation in affecting the variable in VAR. To analyze the innovation in affecting the variables, this study obtained the VDC on the base of Cholesky decomposition factorization for each variable to show how each variable is affected.

# Chapter 4

## Results

### 4.1 Descriptive Statistics

The descriptive Table shows the behavior of the data. Mean and median shows the central tendency of the data whereas standard deviation explains the dispersion of the data that how much data is deviated from its mean. Kurtosis, skewness, minimum and maximum values represent the scattering of the data.

#### 4.1.1 Descriptive Statistics for Overall Banking System

TABLE 4.1: Descriptive Statistics for Overall Banking System

	<b>LD</b>	<b>LC</b>	<b>KIBOR</b>	<b>M2</b>
<b>Mean</b>	18.56841	15.17171	10.32793	8.891745
<b>Median</b>	18.77803	15.37282	10.15667	8.909609
<b>Maximum</b>	20.69124	17.36598	15.16000	9.589656
<b>Minimum</b>	14.44656	9.274535	6.013333	8.214122
<b>Std. Dev.</b>	1.325521	1.332502	2.545408	0.387994
<b>Skewness</b>	-0.839088	-0.900989	-0.248339	0.012935
<b>Kurtosis</b>	3.325876	4.137111	2.042350	1.791267
<b>Jarque-Bera</b>	93.51899	145.2847	37.24105	46.77452
<b>Probability</b>	0.000000	0.000000	0.000000	0.000000
<b>Observations</b>	768	768	768	768

The mean value of deposits and credits shows that banking system has more deposits as compare to credits. The average value of deposits I 18.56 and for

credits are 15.17 that indicates the average quarterly deposits and credits for the banking system in Pakistan. The maximum value of total deposits is 20.69 and for credits are 17.37. The minimum value of deposits is 14.44 and for credits are 9.27. These stat indicate that over all banking system have more deposits as compare to their credits. The standard deviation of deposits and for credits is 1.32 and 1.33 respectively. The average KIBOR rate is 10.32 and average on monetary supply is 8.89. Maximum value of KIBOR and monetary supply is 15.16 and 9.58 respectively. The standard deviation for KIBOR and monetary supply is 2.545 and 0.387 respectively.

The skewness and kurtosis are also listed in the **Table 1.1** that describes the data distribution. If the data is normally distributed then skewness must be zero but for the real world data the perfect zero skewness is unlikely to a certain extent. If it is positive that shows the data is skewed positively and skewed at right means the longer is the right tail than the left and if skewness is showing negative values it means that data is skewed negatively and the left tail is longer than right. In **Table 1.1** the results of skewnesv are negative for deposits, credits, and KIBOR and positive for monetary supply. The skewness values for deposits, credits, KIBOR and monetary supply are -0.839, -0.9009, -0.2483 and 0.0129 respectively. This shows negatively skewed distribution of data for deposits, credits and KIBOR whereas positive for monetary supply. The value of kurtosis is less than 3 for KIBOR and M2 that indicates the normal distribution of data from the point. Kurtosis value is greater than 3 means that data distribution is relatively pointed and shows the peak and flatness of the data. Results of kurtosis for deposits, credits, KIBOR and M2 are 3.325, 4.137, 2.042 and 1.791 respectively.

### 4.1.2 Descriptive Statistics for Conventional Banks

In **Table 4.2**, the mean value of deposits and credits shows that Conventional banks have more deposits than credits. The average value of deposits is 18.43 and for credits is 15.23 that indicates the average quarterly deposits and credits for the conventional banks in Pakistan. The maximum value of total deposits is 20.61 and for credits is 17.36. The minimum value of deposits is 14.44 and for credits

is 10.41. These statistics indicate that conventional banks have more deposits than their credits. The standard deviation of deposits and for credits is 1.32 and 1.28 respectively.

TABLE 4.2: Descriptive Statistics for Conventional Banks

	LCD	LCC	KIBOR	M2
<b>Mean</b>	18.43246	15.23520	10.40381	8.878561
<b>Median</b>	18.70015	15.42477	10.17000	8.867982
<b>Maximum</b>	20.61959	17.36598	15.16000	9.589656
<b>Minimum</b>	14.44656	10.41766	6.013333	8.214122
<b>Std. Dev.</b>	1.320083	1.289174	2.538149	0.386799
<b>Skewness</b>	-0.878565	-0.669315	-0.287899	0.057577
<b>Kurtosis</b>	3.309815	3.114761	2.073214	1.788730
<b>Jarque-Bera</b>	78.26074	44.37543	29.26588	36.39406
<b>Probability</b>	0.000000	0.000000	0.000000	0.000000
<b>Observations</b>	590	590	590	590

### 4.1.3 Descriptive Statistics for Islamic Banks

TABLE 4.3: Descriptive Statistics for Islamic Banks

	LID	LIC	KIBOR	M2
<b>Mean</b>	19.01905	14.96128	10.07642	8.935447
<b>Median</b>	19.29594	15.22227	10.04333	8.993357
<b>Maximum</b>	20.69124	17.35646	15.16000	9.589656
<b>Minimum</b>	14.81510	9.274535	6.013333	8.214122
<b>Std. Dev.</b>	1.244578	1.451079	2.560412	0.389833
<b>Skewness</b>	-0.809142	-1.371523	-0.119677	-0.137357
<b>Kurtosis</b>	3.193837	5.639282	1.981990	1.846425
<b>Jarque-Bera</b>	19.70177	107.4683	8.111129	10.42934
<b>Probability</b>	0.000053	0.000000	0.017326	0.005436
<b>Observations</b>	178	178	178	178

The mean value of credits and deposits shows that Islamic banks have more deposits as compare to credits. The average value of deposits is 19.01 and for credits is 14.96 that indicates the average quarterly deposits and credits for the Islamic banks in Pakistan.

The maximum value of total deposits is 20.69 and for credits is 17.35. The minimum value of deposits is 14.81 and for credits is 9.27. These stat indicate that Islamic banks have more deposits as compare to their credits. The standard deviation of deposits and for credits is 1.24 and 1.45 respectively.

#### 4.1.4 Comparison of Conventional and Islamic banks

The average of Islamic banks quarterly deposits is greater as compare to conventional banks whereas the average of credits in conventional banks is greater than Islamic bank.

So, the deposits value shows that Islamic banks have more deposits as compare to conventional banks. Furthermore, conventional banks have more credits than Islamic banks.

Standard deviation of deposits in conventional banks is greater as compare to Islamic banks and credits standard deviation in Islamic banks greater than conventional banks. It means that there is more dispersion in deposits' data of conventional banks and in credits' data of Islamic banks.

## 4.2 Scattered Graphs

Before discussing the results of Panel-VAR Model, this study draw the scatter plots of credits and deposits on KIBOR and M2 for overall Banking system, conventional and Islamic banks to show the relationship between these variables.

To get an idea either monetary shock's expected outcome is observable or not on raw data of deposits and credits, we put a simple regression line.

The Figures 4.2, 4.4, 4.6, 4.8, 4.10, and 4.12 reveal that the deposits and credits of overall banking sector, conventional and Islamic banks are positively linked with



### 4.2.1 Scattered Graphs for Overall Banking System

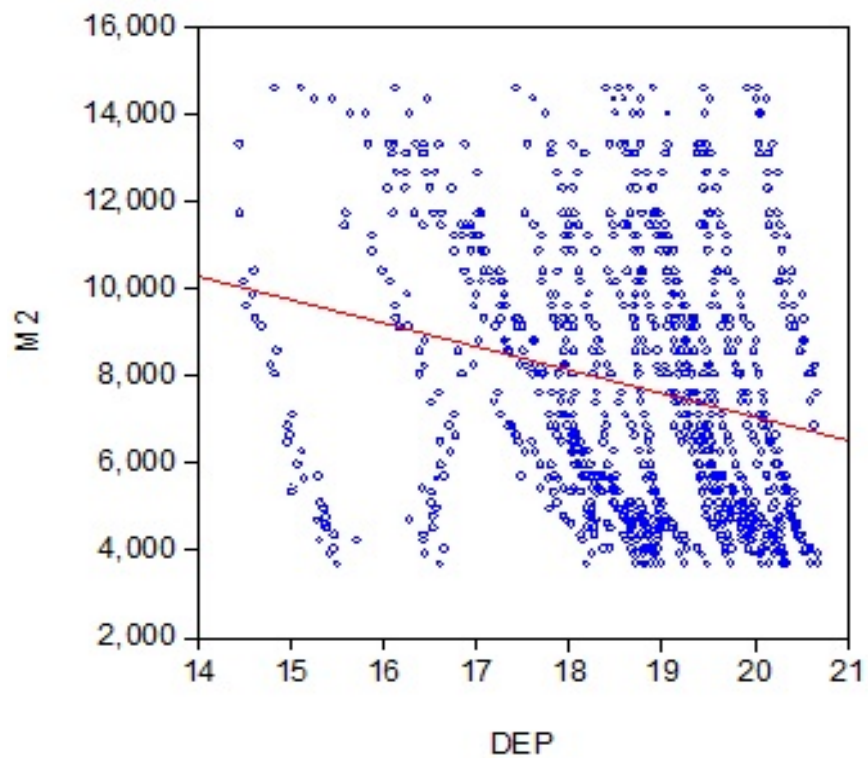


FIGURE 4.1: Scattered Graph of M2 and DEP

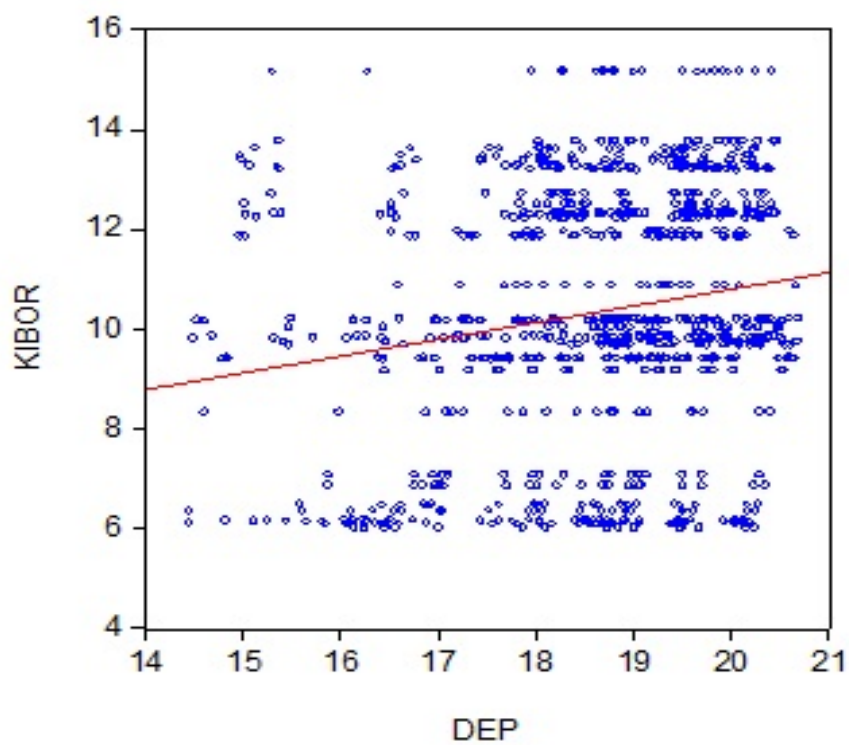


FIGURE 4.2: Scattered Graph of KIBOR and DEP

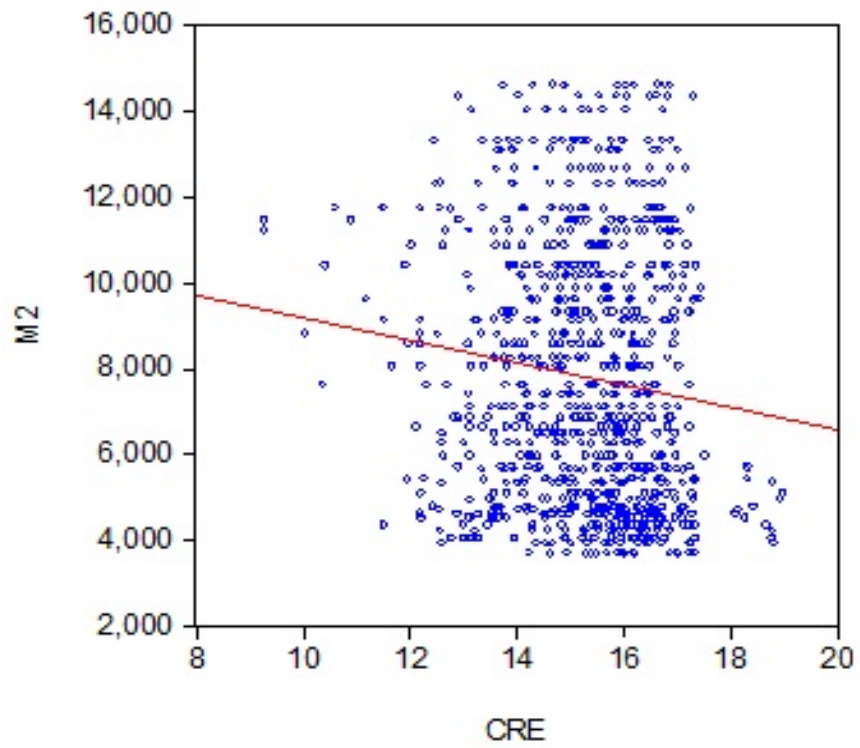


FIGURE 4.3: Scattered Graph of M2 and CRE

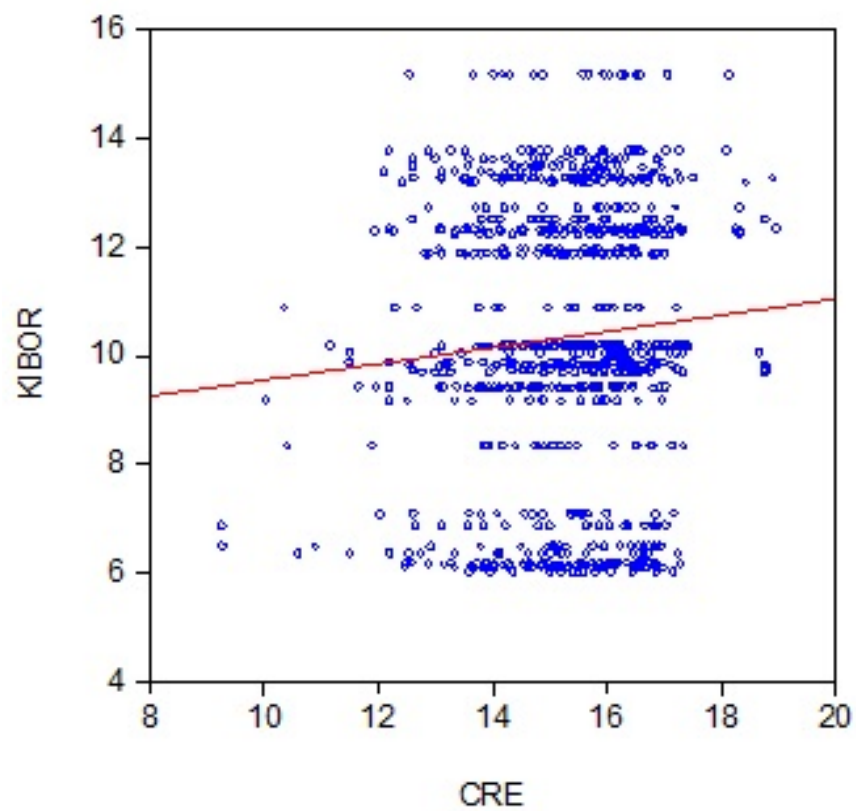


FIGURE 4.4: Scattered Graph of KIBOR and CRE

### 4.2.2 Scattered Graphs for Conventional Banks

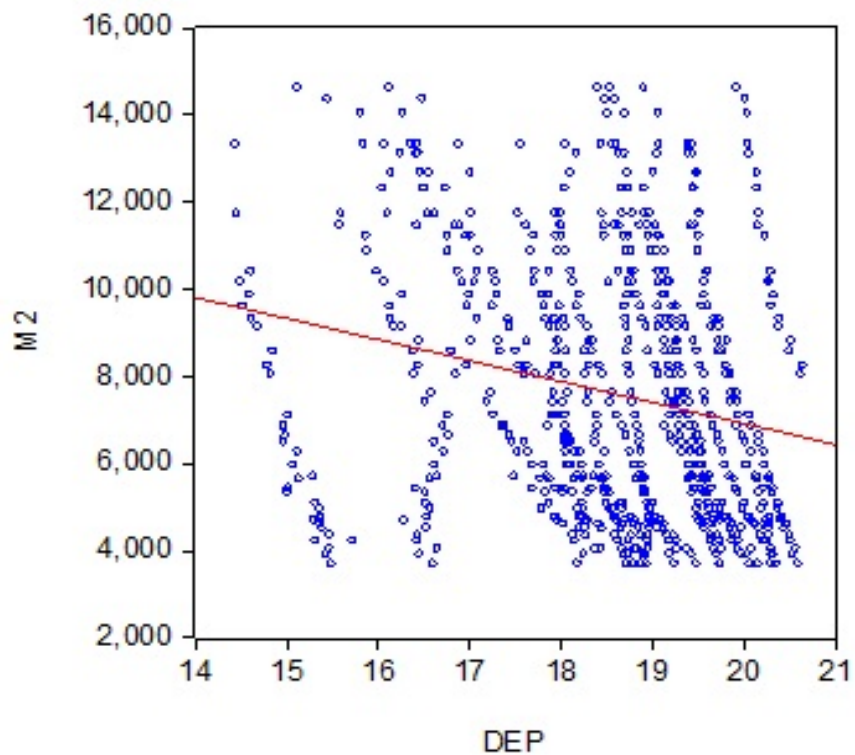


FIGURE 4.5: Scattered Graph of M2 and DEP

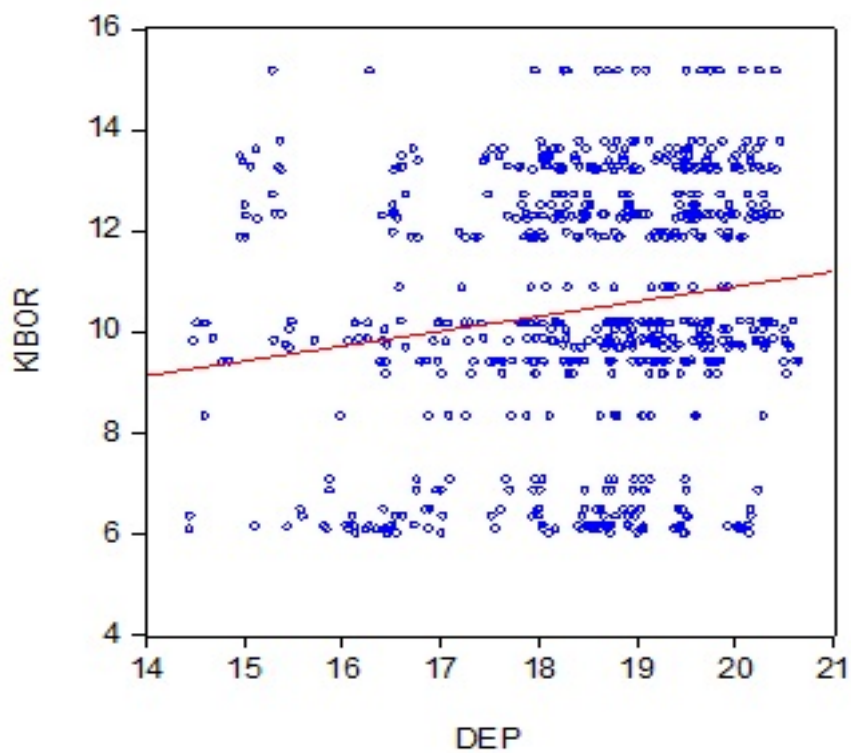


FIGURE 4.6: Scattered Graph of KIBOR and DEP

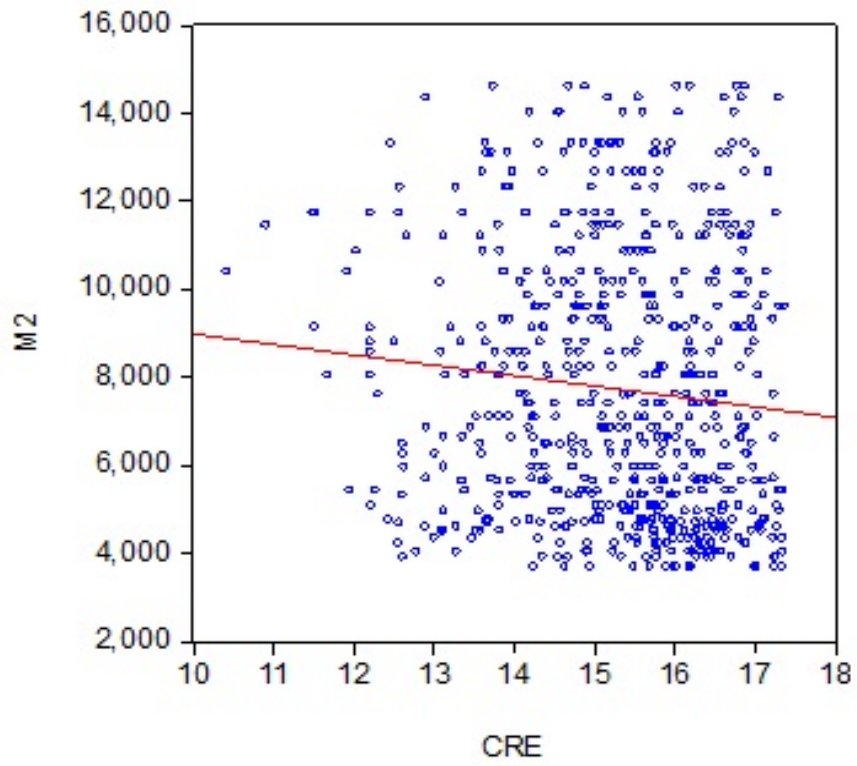


FIGURE 4.7: Scattered Graph of M2 and CRE

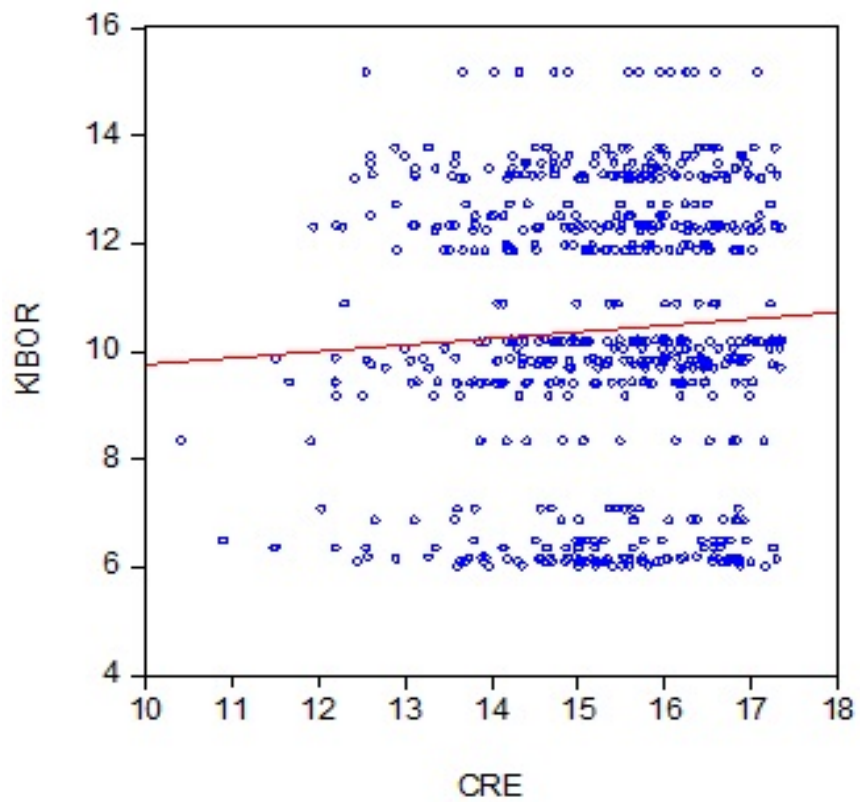


FIGURE 4.8: Scattered Graph of KIBOR and CRE

### 4.2.3 Scattered Graphs for Islamic Banks

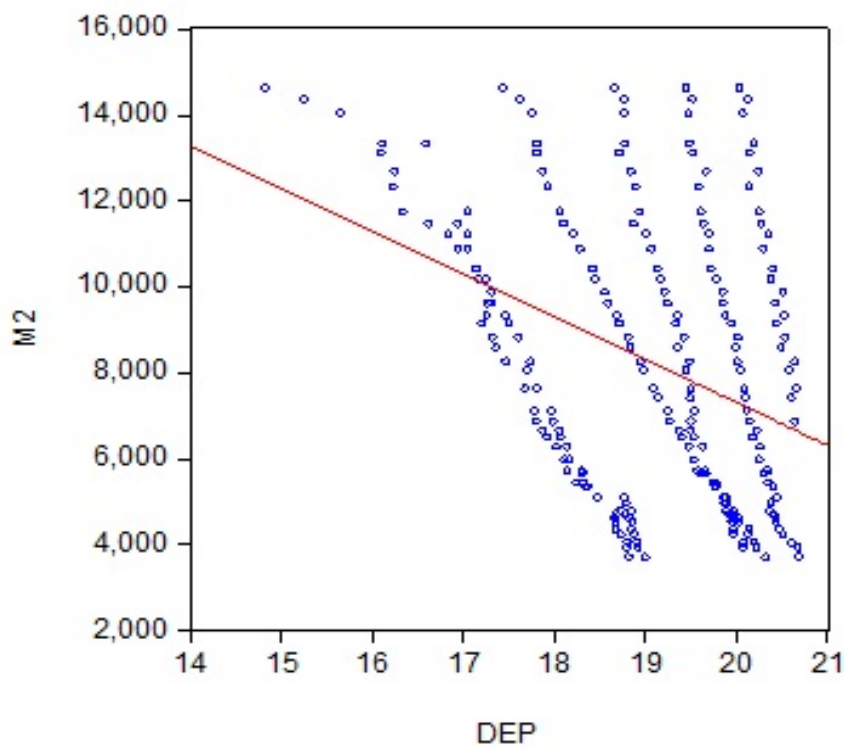


FIGURE 4.9: Scattered Graph of M2 and DEP

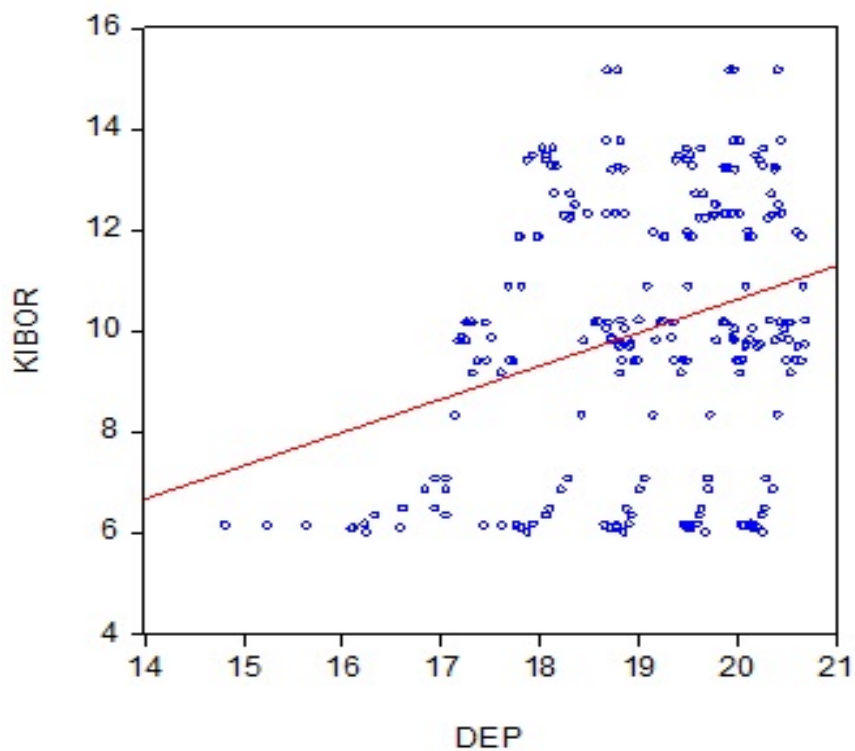


FIGURE 4.10: Scattered Graph of KIBOR and DEP

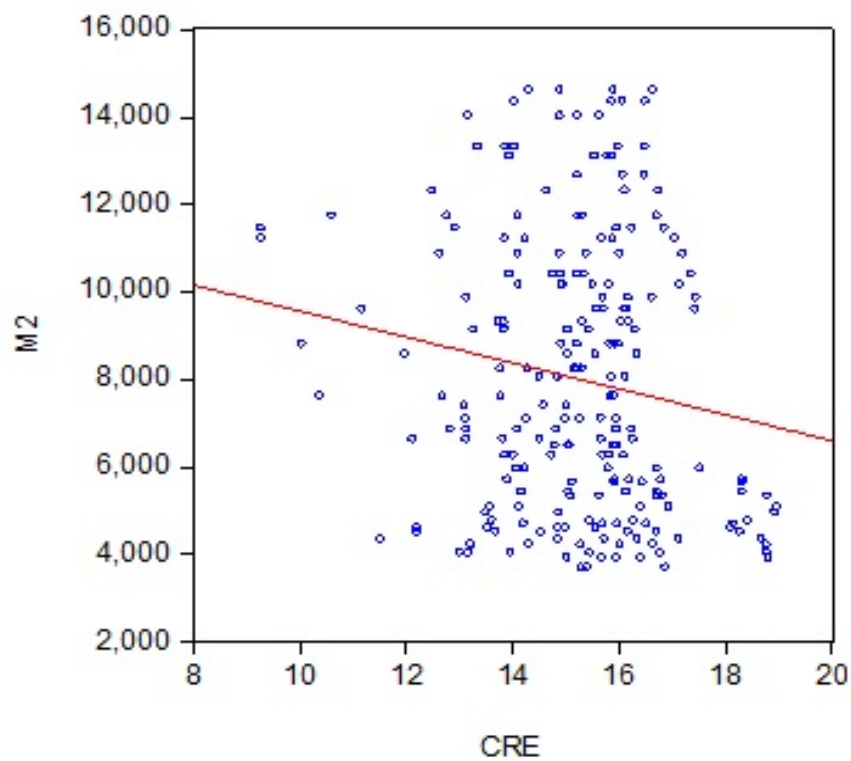


FIGURE 4.11: Scattered Graph of M2 and CRE

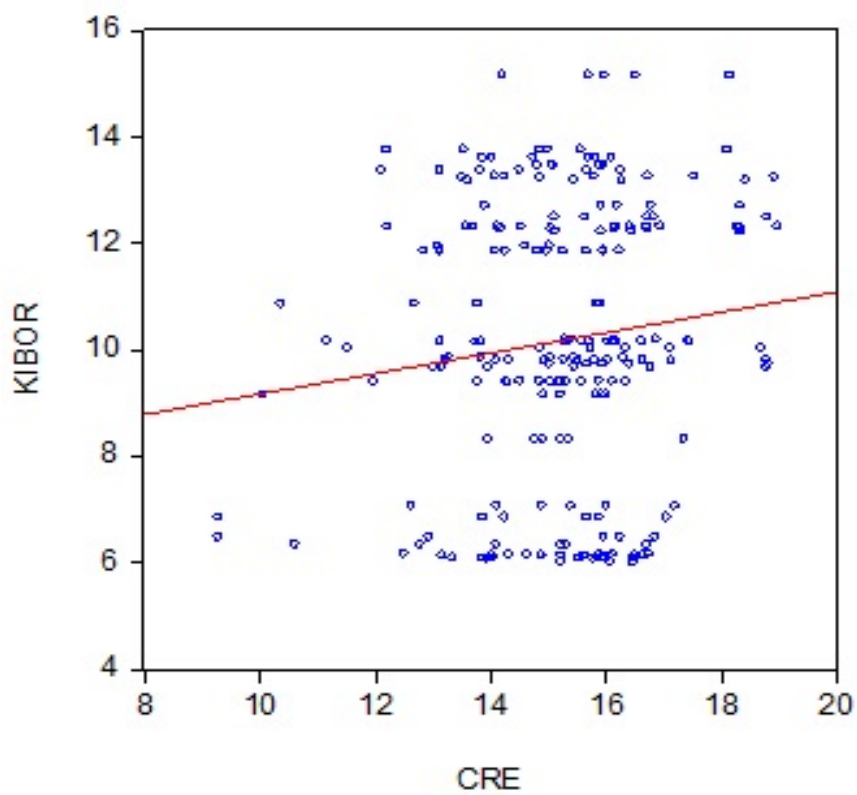


FIGURE 4.12: Scattered Graph of KIBOR and CRE



KIBOR and Figures 4.1, 2.3, 4.5, 4.7, 4.9, and 4.11 reveals that deposits and credits of overall banking sector, conventional banks and Islamic banks are negatively linked M2. The figures slope reveals that Islamic banks are however steeper, and mimicking the larger response to monetary shocks of Islamic banks customer.

### 4.3 Unit Root Test

This study initially conducts a unit root test on all the variables that are used in the study because the application of Vector Autoregression requires the absence of unit roots in variables.

Therefore, to address about the unit root presence Levin Lin and Chu, Augmented Dickey-Fuller (ADF) and Phillips-Peron test has been used.

The **Table 4.4** reported the results of Levin Lin and Chu, PP and ADF unit root tests. The null hypothesis of this that all series are non stationary and the alternative hypothesis of the study is that at least one of these series is stationary in the panel.

Though, all the variables that analyzed in the study are stationary at level for that reason unit root test suggests that Levin Lin and Chu, Fisher ADF and PP rejects the existence of unit roots at the significance levels.

### 4.4 Vector Auto-Regression

After analyzing the stationarity of variables, this study used VAR model for analyzing the dynamic impact of random disturbances on the system of variables.

The VAR model approach treats each variable as an endogenous variable in the system and each endogenous variable as a function of p-lagged values of all endogenous variables in the system.

TABLE 4.4: Unit Root Test

Variables	Definition	ADF	Probability	Phillips- Peron	Probability	Levin, Lin & Chu	Probability
<b>All Banks</b>							
Deposits	Total Deposits	84.6032	0.0005	119.4	0.0000	-5.5702	0.0000
Credits	Total Credits	218.773	0.0000	220.21	0.0000	-8.6344	0.0000
<b>Conventional Banks</b>							
Deposits	Total Deposits	66.9552	0.0013	98.284	0.0000	-8.0174	0.0000
Credits	Total Credits	167.121	0.0000	169.23	0.0000	-4.375	0.0000
<b>Islamic Banks</b>							
Deposits	Total Deposits	21.2761	0.0192	20.375	0.0259	-3.9978	0.0000
Credits	Total Credits	51.5425	0.0000	50.945	0.0000	-3.8246	0.0001
<b>Macroeconomic and Monetary Variable:</b>							
KIBOR	KIBOR rate	89.5191	0.0000	89.466	0.0000	-4.0377	0.0000
M2	Money supply	856.245	0.0000	863.71	0.0000	-38.797	0.0000



TABLE 4.5: Vector Auto-Regression in Overall Banking System

<b>Vector Autoregression Estimates</b>				
	<b>DEP</b>	<b>CRE</b>	<b>KIBOR</b>	<b>M2</b>
DEP(-1)	0.283091 (0.05481) [ 5.16457]	0.116404 (0.18669) [ 0.62351]	-0.06134 (0.14006) [-0.43793]	3.416114 (11.6251) [ 0.29386]
DEP(-2)	0.237082 (0.05586) [ 4.24454]	0.083697 (0.19024) [ 0.43996]	0.034864 (0.14272) [ 0.24428]	-11.747 (11.8460) [-0.99164]
DEP(-3)	0.200479 (0.05628) [ 3.56194]	-0.02883 (0.19170) [-0.15041]	0.044167 (0.14381) [ 0.30711]	9.611818 (11.9368) [ 0.80523]
DEP(-4)	0.177809 (0.07305) [ 2.43415]	-0.18037 (0.24879) [-0.72498]	0.082057 (0.18665) [ 0.43964]	18.03268 (15.4921) [ 1.16399]
DEP(-5)	0.090173 (0.07334) [ 1.22951]	-2.09E-05 (0.24979) [-8.4e-05]	-0.25069 (0.18739) [-1.33774]	-13.044 (15.5542) [-0.83861]
DEP(-6)	0.038358 (0.07431) [ 0.51621]	0.141164 (0.25308) [ 0.55779]	-0.00786 (0.18986) [-0.04139]	7.894444 (15.7589) [ 0.50095]
DEP(-7)	-0.04544 (0.07124) [-0.63778]	-0.47083 (0.24263) [-1.94052]	0.227889 (0.18202) [ 1.25197]	-11.8723 (15.1084) [-0.78581]
DEP(-8)	0.004345 (0.05936) [ 0.07319]	0.386206 (0.20219) [ 1.91013]	-0.06534 (0.15168) [-0.43074]	-4.57811 (12.5902) [-0.36363]
CRE(-1)	0.000729 (0.01658) [ 0.04397]	0.355828 (0.05648) [ 6.30059]	0.044910 (0.04237) [ 1.05999]	0.487452 (3.51669) [ 0.13861]

## 4.5: Continued

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CRE(-2)	0.005300 (0.01727) [ 0.30684]	0.165399 (0.05883) [ 2.81168]	-0.0313 (0.04413) [-0.70917]	-3.054 (3.66305) [-0.83373]
CRE(-3)	-0.02458 (0.01701) [-1.44509]	0.253592 (0.05792) [ 4.37817]	0.015953 (0.04345) [ 0.36712]	6.082339 (3.60676) [ 1.68637]
CRE(-4)	0.007527 (0.01706) [ 0.44127]	0.138408 (0.05810) [ 2.38228]	-0.01602 (0.04359) [-0.36754]	-2.55151 (3.61779) [-0.70527]
CRE(-5)	0.025398 (0.01628) [ 1.56045]	-0.0809 (0.05543) [-1.45940]	-0.00645 (0.04159) [-0.15512]	3.319413 (3.45182) [ 0.96164]
CRE(-6)	-0.02284 (0.01645) [-1.38853]	0.030082 (0.05602) [ 0.53695]	0.039495 (0.04203) [ 0.93969]	-4.14029 (3.48858) [-1.18681]
CRE(-7)	-0.00457 (0.01602) [-0.28538]	0.018842 (0.05455) [ 0.34538]	-0.01286 (0.04093) [-0.31420]	1.816390 (3.39695) [ 0.53471]
CRE(-8)	0.006867 (0.01456) [ 0.47170]	-0.00615 (0.04958) [-0.12411]	-0.04167 (0.03720) [-1.12014]	-0.06556 (3.08751) [-0.02124]
KIBOR(-1)	0.006478 (0.02134) [ 0.30358]	-0.03099 (0.07267) [-0.42640]	0.993423 (0.05452) [ 18.2209]	18.71258 (4.52538) [ 4.13503]
KIBOR(-2)	4.15E-05 (0.03207) [ 0.00129]	-0.07054 (0.10922) [-0.64582]	0.005082 (0.08194) [ 0.06202]	-13.5745 (6.80132) [-1.99586]
KIBOR(-3)	-0.01211 (0.03033) [-0.39938]	0.165455 (0.10329) [ 1.60182]	-0.49475 (0.07749) [-6.38464]	-7.31707 (6.43194) [-1.13761]
KIBOR(-4)	-0.06954 (0.03125) [-2.22527]	-0.05695 (0.10643) [-0.53509]	0.342501 (0.07984) [ 4.28960]	34.38584 (6.62729) [ 5.18852]
KIBOR(-5)	0.089982 (0.03591) [ 2.50608]	-0.10968 (0.12229) [-0.89688]	-0.01998 (0.09174) [-0.21779]	-16.5578 (7.61490) [-2.17439]

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## 4.5: Continued

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KIBOR(-6)	-0.02585 (0.03366) [-0.76792]	0.114702 (0.11464) [ 1.00055]	-0.20581 (0.08600) [-2.39302]	-17.0387 (7.13852) [-2.38687]
KIBOR(-7)	-0.0146 (0.03362) [-0.43432]	-0.10893 (0.11451) [-0.95128]	0.124761 (0.08591) [ 1.45228]	-2.01144 (7.13052) [-0.28209]
KIBOR(-8)	0.018351 (0.02695) [ 0.68085]	0.085065 (0.09180) [ 0.92663]	0.152309 (0.06887) [ 2.21154]	4.742787 (5.71638) [ 0.82968]
M2(-1)	6.08E-05 (0.00026) [ 0.22978]	-0.00052 (0.00090) [-0.58036]	-0.0049 (0.00068) [-7.24999]	0.877494 (0.05607) [ 15.6492]
M2(-2)	-2.91E-05 (0.00034) [-0.08681]	4.28E-05 (0.00114) [ 0.03745]	0.003265 (0.00086) [ 3.80840]	0.216962 (0.07116) [ 3.04891]
M2(-3)	0.000512 (0.00035) [ 1.47964]	-0.00082 (0.00118) [-0.69971]	0.000205 (0.00088) [ 0.23207]	-0.32587 (0.07335) [-4.44270]
M2(-4)	-0.00083 (0.00032) [-2.62529]	0.001788 (0.00108) [ 1.66034]	-0.00342 (0.00081) [-4.22848]	0.537224 (0.06707) [ 8.01015]
M2(-5)	-0.00021 (0.00027) [-0.79548]	0.000592 (0.00090) [ 0.65477]	0.003553 (0.00068) [ 5.23874]	-0.2701 (0.05629) [-4.79854]
M2(-6)	0.000457 (0.00026) [ 1.78179]	-0.00077 (0.00087) [-0.88195]	-8.39E-05 (0.00066) [-0.12794]	-0.00768 (0.05445) [-0.14110]
M2(-7)	-0.00011 (0.00025) [-0.42817]	0.000662 (0.00085) [ 0.77610]	-0.00162 (0.00064) [-2.52703]	0.050669 (0.05314) [ 0.95346]
M2(-8)	0.000139 (0.00019) [ 0.73334]	-0.00095 (0.00065) [-1.46996]	0.002561 (0.00049) [ 5.27299]	-0.0994 (0.04030) [-2.46626]
C	0.512274 (0.56020) [ 0.91444]	1.290153 (1.90799) [ 0.67619]	0.696778 (1.43140) [ 0.48678]	6.466405 (118.809) [ 0.05443]

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## 4.5: Continued

R-squared	0.956455	0.656089	0.905063	0.999525
Adj. R-squared	0.952167	0.622227	0.895715	0.999478
Sum sq. resids	19.88677	230.6878	129.8358	894488.8
S.E. equation	0.247366	0.842501	0.632056	52.46211
F-statistic	223.0790	19.37539	96.82241	21353.38
Log likelihood	9.415647	-429.315	-326.427	-1908.38
Akaike AIC	0.131756	2.582767	2.007972	10.84571
Schwarz SC	0.489459	2.940469	2.365675	11.20341
Mean dependent	18.89144	15.32754	11.02839	6746.280
S.D. dependent	1.131041	1.370740	1.957244	2295.743

TABLE 4.6: Vector Auto-Regression in Conventional Banking System

<b>Vector Autoregression Estimates</b>				
	<b>CDEP</b>	<b>CCRE</b>	<b>KIBOR</b>	<b>M2</b>
CDEP(-1)	0.271190 (0.06539) [ 4.14721]	0.028925 (0.17925) [ 0.16137]	-0.04509 (0.14748) [-0.30573]	-1.56444 (11.6674) [-0.13409]
CDEP(-2)	0.243799 (0.06650) [ 3.66588]	0.132839 (0.18231) [ 0.72867]	-0.04051 (0.14999) [-0.27009]	-8.31284 (11.8661) [-0.70055]
CDEP(-3)	0.195741 (0.06715) [ 2.91517]	-0.06049 (0.18406) [-0.32866]	0.072562 (0.15143) [ 0.47917]	7.628362 (11.9804) [ 0.63673]
CDEP(-4)	0.168502 (0.08724) [ 1.93141]	-0.07794 (0.23915) [-0.32588]	0.094132 (0.19676) [ 0.47841]	22.04212 (15.5663) [ 1.41601]
CDEP(-5)	0.122036 (0.08717) [ 1.40003]	0.065931 (0.23894) [ 0.27593]	-0.2724 (0.19659) [-1.38565]	-16.2755 (15.5527) [-1.04647]
CDEP(-6)	0.024484 (0.08826) [ 0.27742]	0.160230 (0.24194) [ 0.66228]	-0.0043 (0.19905) [-0.02158]	11.17842 (15.7475) [ 0.70986]
CDEP(-7)	-0.0427 (0.08433) [-0.50626]	-0.55073 (0.23118) [-2.38224]	0.265298 (0.19020) [ 1.39484]	-17.983 (15.0474) [-1.19509]

## 4.6: Continued

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CDEP(-8)	0.021014 (0.07025) [ 0.29915]	0.445542 (0.19256) [ 2.31379]	-0.0798 (0.15842) [-0.50374]	1.162226 (12.5335) [ 0.09273]
CCRE(-1)	-0.00893 (0.02563) [-0.34856]	0.347226 (0.07024) [ 4.94311]	0.042272 (0.05779) [ 0.73144]	1.315825 (4.57215) [ 0.28779]
CCRE(-2)	-0.00668 (0.02651) [-0.25209]	0.193332 (0.07267) [ 2.66041]	-0.03245 (0.05979) [-0.54282]	-5.25728 (4.73002) [-1.11147]
CCRE(-3)	-0.05642 (0.02606) [-2.16503]	0.169910 (0.07144) [ 2.37852]	0.058152 (0.05877) [ 0.98946]	4.806879 (4.64966) [ 1.03381]
CCRE(-4)	0.007749 (0.02521) [ 0.30741]	0.054363 (0.06910) [ 0.78677]	-0.00691 (0.05685) [-0.12155]	-7.11039 (4.49745) [-1.58098]
CCRE(-5)	0.049209 (0.02481) [ 1.98309]	-0.0776 (0.06802) [-1.14077]	-0.05136 (0.05596) [-0.91776]	6.402099 (4.42747) [ 1.44599]
CCRE(-6)	-0.0392 (0.02549) [-1.53813]	-0.00465 (0.06987) [-0.06653]	0.070555 (0.05748) [ 1.22745]	-1.61281 (4.54755) [-0.35465]
CCRE(-7)	-0.00391 (0.02452) [-0.15938]	0.013175 (0.06722) [ 0.19599]	0.008440 (0.05531) [ 0.15261]	2.833669 (4.37561) [ 0.64761]
CCRE(-8)	0.022201 (0.02339) [ 0.94923]	0.082198 (0.06411) [ 1.28209]	-0.07179 (0.05275) [-1.36099]	-3.53699 (4.17306) [-0.84758]
KIBOR(-1)	0.005595 (0.02894) [ 0.19335]	5.64E-05 (0.07932) [ 0.00071]	0.963797 (0.06526) [ 14.7684]	22.65149 (5.16304) [ 4.38724]
KIBOR(-2)	0.005699 (0.04358) [ 0.13076]	-0.1516 (0.11947) [-1.26896]	0.017961 (0.09829) [ 0.18274]	-15.299 (7.77627) [-1.96740]
KIBOR(-3)	-0.0113 (0.04117) [-0.27444]	0.229687 (0.11286) [ 2.03508]	-0.49983 (0.09286) [-5.38281]	-9.51851 (7.34622) [-1.29570]

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## 4.6: Continued

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KIBOR(-4)	-0.10921 (0.04254) [-2.56750]	-0.03981 (0.11660) [-0.34139]	0.352938 (0.09593) [ 3.67911]	35.14435 (7.58945) [ 4.63069]
KIBOR(-5)	0.119698 (0.04973) [ 2.40719]	-0.22916 (0.13631) [-1.68116]	-0.00679 (0.11215) [-0.06055]	-18.2389 (8.87225) [-2.05573]
KIBOR(-6)	-0.03038 (0.04676) [-0.64968]	0.183248 (0.12817) [ 1.42971]	-0.25804 (0.10545) [-2.44706]	-15.3552 (8.34259) [-1.84058]
KIBOR(-7)	-0.03819 (0.04643) [-0.82260]	-0.17199 (0.12727) [-1.35131]	0.176627 (0.10471) [ 1.68679]	-4.08746 (8.28414) [-0.49341]
KIBOR(-8)	0.026246 (0.03734) [ 0.70291]	0.075874 (0.10236) [ 0.74127]	0.174909 (0.08421) [ 2.07704]	2.560113 (6.66224) [ 0.38427]
M2(-1)	-0.00013 (0.00038) [-0.32723]	-0.00032 (0.00105) [-0.30925]	-0.00489 (0.00086) [-5.66345]	0.911277 (0.06825) [ 13.3513]
M2(-2)	0.000138 (0.00048) [ 0.28543]	0.000121 (0.00132) [ 0.09151]	0.003391 (0.00109) [ 3.11701]	0.237265 (0.08607) [ 2.75660]
M2(-3)	0.000871 (0.00049) [ 1.77824]	-0.00078 (0.00134) [-0.58027]	-0.0004 (0.00110) [-0.36347]	-0.3191 (0.08739) [-3.65130]
M2(-4)	-0.00128 (0.00045) [-2.82971]	0.001509 (0.00124) [ 1.21429]	-0.00326 (0.00102) [-3.19231]	0.514809 (0.08088) [ 6.36527]
M2(-5)	-0.0004 (0.00038) [-1.04372]	0.000800 (0.00105) [ 0.76447]	0.003893 (0.00086) [ 4.51987]	-0.29103 (0.06815) [-4.27052]
M2(-6)	0.000733 (0.00037) [ 1.96553]	-0.00107 (0.00102) [-1.04577]	-0.00039 (0.00084) [-0.46317]	-0.00775 (0.06653) [-0.11648]
M2(-7)	-0.00015 (0.00036) [-0.41738]	0.001084 (0.00099) [ 1.09478]	-0.00167 (0.00081) [-2.04907]	0.044739 (0.06446) [ 0.69405]

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## 4.6: Continued

M2(-8)	0.000175 (0.00028) [ 0.63363]	-0.00137 (0.00076) [-1.81206]	0.002899 (0.00062) [ 4.66379]	-0.109 (0.04918) [-2.21615]
C	1.075695 (0.79201) [ 1.35818]	2.668003 (2.17109) [ 1.22888]	0.001680 (1.78621) [ 0.00094]	136.1007 (141.315) [ 0.96310]
R-squared	0.942072	0.644421	0.899186	0.999535
Adj. R-squared	0.933759	0.593396	0.884719	0.999469
Sum sq. resids	18.37134	138.0493	93.44245	584858.7
S.E. equation	0.287024	0.786801	0.647321	51.21216
F-statistic	113.3309	12.62957	62.15582	14992.07
Log likelihood	-26.0469	-284.2	-234.246	-1353.19
Akaike AIC	0.461304	2.478123	2.087858	10.82964
Schwarz SC	0.918300	2.935119	2.544853	11.28663
Mean dependent	18.59803	15.24007	11.14591	6576.454
S.D. dependent	1.115206	1.233897	1.906517	2221.824

TABLE 4.7: Vector Auto-Regression in Islamic Banking System

<b>Vector Autoregression Estimates</b>				
	<b>IDEP</b>	<b>ICRE</b>	<b>KIBOR</b>	<b>M2</b>
IDEP(-1)	0.651550 (0.11649) [ 5.59300]	3.817189 (3.08006) [ 1.23932]	-2.32573 (2.04908) [-1.13501]	103.7422 (160.091) [ 0.64802]
IDEP(-2)	0.351913 (0.13469) [ 2.61274]	-1.89403 (3.56119) [-0.53185]	5.224244 (2.36916) [ 2.20511]	-370.866 (185.099) [-2.00361]
IDEP(-3)	-0.1849 (0.13301) [-1.39017]	1.607106 (3.51671) [ 0.45699]	-0.23528 (2.33957) [-0.10057]	552.8966 (182.787) [ 3.02482]
IDEP(-4)	0.385775 (0.13954) [ 2.76463]	-7.72862 (3.68939) [-2.09483]	0.877327 (2.45444) [ 0.35744]	-246.436 (191.762) [-1.28511]
IDEP(-5)	-0.20122 (0.14949) [-1.34600]	0.603972 (3.95255) [ 0.15281]	-0.40866 (2.62952) [-0.15541]	207.0426 (205.440) [ 1.00780]

## 4.7: Continued

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IDEP(-6)	-0.18659 (0.14327) [-1.30234]	1.015033 (3.78802) [ 0.26796]	-3.01152 (2.52006) [-1.19502]	-173.368 (196.888) [-0.88054]
IDEP(-7)	0.127019 (0.12776) [ 0.99420]	1.597891 (3.37796) [ 0.47304]	-0.19355 (2.24725) [-0.08613]	186.8971 (175.574) [ 1.06449]
IDEP(-8)	0.042635 (0.09358) [ 0.45558]	0.850081 (2.47433) [ 0.34356]	0.277280 (1.64610) [ 0.16845]	-246.013 (128.607) [-1.91290]
ICRE(-1)	0.003781 (0.00484) [ 0.78109]	0.295931 (0.12799) [ 2.31205]	0.059596 (0.08515) [ 0.69989]	-3.14856 (6.65273) [-0.47327]
ICRE(-2)	0.005338 (0.00497) [ 1.07439]	0.090140 (0.13136) [ 0.68619]	-0.08148 (0.08739) [-0.93230]	-3.4105 (6.82781) [-0.49950]
ICRE(-3)	0.009059 (0.00497) [ 1.82175]	0.384509 (0.13147) [ 2.92464]	-0.03306 (0.08746) [-0.37801]	1.492482 (6.83347) [ 0.21841]
ICRE(-4)	-0.00466 (0.00536) [-0.86940]	0.225329 (0.14166) [ 1.59064]	-0.00915 (0.09424) [-0.09711]	4.523131 (7.36296) [ 0.61431]
ICRE(-5)	-0.00061 (0.00447) [-0.13528]	-0.04401 (0.11831) [-0.37200]	0.035639 (0.07871) [ 0.45280]	2.669101 (6.14937) [ 0.43404]
ICRE(-6)	-0.00475 (0.00420) [-1.12901]	-0.00402 (0.11113) [-0.03612]	0.035035 (0.07393) [ 0.47387]	-2.56933 (5.77633) [-0.44480]
ICRE(-7)	0.005697 (0.00429) [ 1.32823]	0.074238 (0.11340) [ 0.65468]	-0.07981 (0.07544) [-1.05795]	1.042179 (5.89390) [ 0.17682]
ICRE(-8)	-0.00845 (0.00363) [-2.32521]	-0.13472 (0.09606) [-1.40252]	0.029155 (0.06390) [ 0.45623]	4.585949 (4.99269) [ 0.91853]
KIBOR(-1)	0.000607 (0.00705) [ 0.08602]	-0.10625 (0.18650) [-0.56971]	1.015143 (0.12408) [ 8.18163]	4.521706 (9.69386) [ 0.46645]

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## 4.7: Continued

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KIBOR(-2)	0.000412 (0.01002) [ 0.04107]	0.176090 (0.26493) [ 0.66466]	-0.03711 (0.17625) [-0.21054]	-5.62664 (13.7703) [-0.40861]
KIBOR(-3)	-0.00779 (0.00960) [-0.81057]	0.050195 (0.25395) [ 0.19766]	-0.51468 (0.16894) [-3.04647]	-0.39649 (13.1992) [-0.03004]
KIBOR(-4)	0.000149 (0.01003) [ 0.01483]	-0.11927 (0.26528) [-0.44960]	0.353071 (0.17648) [ 2.00063]	23.97329 (13.7881) [ 1.73869]
KIBOR(-5)	0.015339 (0.01051) [ 1.45966]	0.148206 (0.27784) [ 0.53342]	-0.00345 (0.18484) [-0.01864]	-11.0555 (14.4412) [-0.76555]
KIBOR(-6)	-0.00348 (0.01005) [-0.34679]	-0.01196 (0.26562) [-0.04502]	-0.13033 (0.17671) [-0.73756]	-13.8501 (13.8058) [-1.00321]
KIBOR(-7)	0.001639 (0.01039) [ 0.15769]	-0.04113 (0.27478) [-0.14967]	-0.0132 (0.18280) [-0.07221]	-1.34351 (14.2820) [-0.09407]
KIBOR(-8)	-0.00651 (0.00854) [-0.76289]	0.080105 (0.22572) [ 0.35489]	0.141236 (0.15016) [ 0.94054]	5.908823 (11.7321) [ 0.50364]
M2(-1)	0.000131 (8.5E-05) [ 1.54259]	0.000529 (0.00224) [ 0.23657]	-0.00553 (0.00149) [-3.71785]	0.904733 (0.11629) [ 7.78011]
M2(-2)	-0.00011 (0.00011) [-0.98060]	-0.00329 (0.00289) [-1.13625]	0.003871 (0.00192) [ 2.01177]	-0.19903 (0.15034) [-1.32389]
M2(-3)	0.000110 (0.00011) [ 0.97334]	0.002424 (0.00298) [ 0.81359]	-0.00038 (0.00198) [-0.19161]	0.023729 (0.15485) [ 0.15323]
M2(-4)	-7.84E-05 (9.7E-05) [-0.80669]	0.001174 (0.00257) [ 0.45669]	-0.00305 (0.00171) [-1.78078]	0.239668 (0.13363) [ 1.79352]
M2(-5)	2.11E-06 (8.0E-05) [ 0.02652]	0.001660 (0.00211) [ 0.78832]	0.002428 (0.00140) [ 1.73348]	-0.00886 (0.10943) [-0.08093]

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## 4.7: Continued

M2(-6)	2.26E-05 (7.0E-05) [ 0.32154]	-0.00021 (0.00185) [-0.11207]	0.000867 (0.00123) [ 0.70239]	-0.03201 (0.09640) [-0.33202]
M2(-7)	-1.40E-05 (7.1E-05) [-0.19735]	-0.0013 (0.00187) [-0.69398]	-0.00109 (0.00124) [-0.87122]	0.137433 (0.09727) [ 1.41294]
M2(-8)	-4.76E-05 (5.4E-05) [-0.88294]	-0.00075 (0.00143) [-0.52506]	0.002267 (0.00095) [ 2.39157]	-0.10704 (0.07407) [-1.44523]
C	0.212548 (0.23682) [ 0.89751]	1.485817 (6.26147) [ 0.23730]	-1.38306 (4.16557) [-0.33202]	-425.837 (325.449) [-1.30846]
R-squared	0.998464	0.757701	0.930981	0.999698
Adj. R-squared	0.997751	0.645330	0.898972	0.999557
Sum sq. resids	0.095548	66.79331	29.56172	180446.3
S.E. equation	0.037212	0.983880	0.654546	51.13868
F-statistic	1401.547	6.742872	29.08516	7129.600
Log likelihood	210.8966	-123.14	-81.5686	-526.121
Akaike AIC	-3.48817	3.061566	2.246443	10.96315
Schwarz SC	-2.63891	3.910822	3.095699	11.81241
Mean dependent	19.62784	15.54708	10.73346	7172.510
S.D. dependent	0.784761	1.652075	2.059301	2430.872

## 4.5 Impulse Response Functions

To examine the dynamic effects of KIBOR and money supply on the deposits and credits of overall banking system, conventional and Islamic banks study used the Impulse Response Functions (IRFs).

The given Figures show the IRFs based on VAR model in respect to the deposits and credits for overall banking system, conventional and Islamic banks.

This study focused on the result discussion of IRFs of macroeconomic shocks that are reported below.

### 4.5.1 IRFs for Overall Banking System

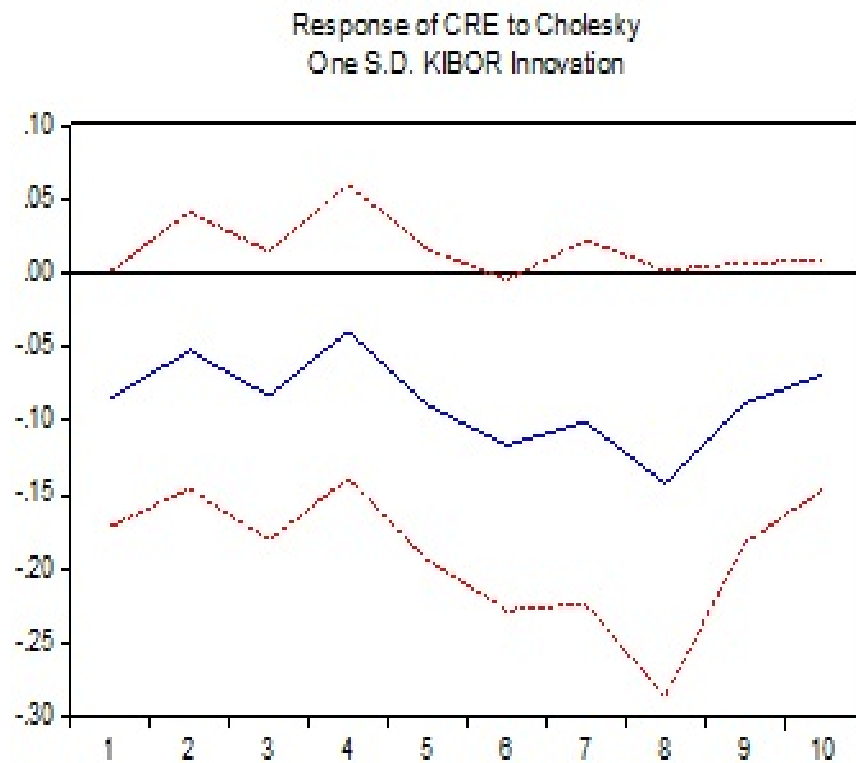


FIGURE 4.13: Response of CRE to KIBOR

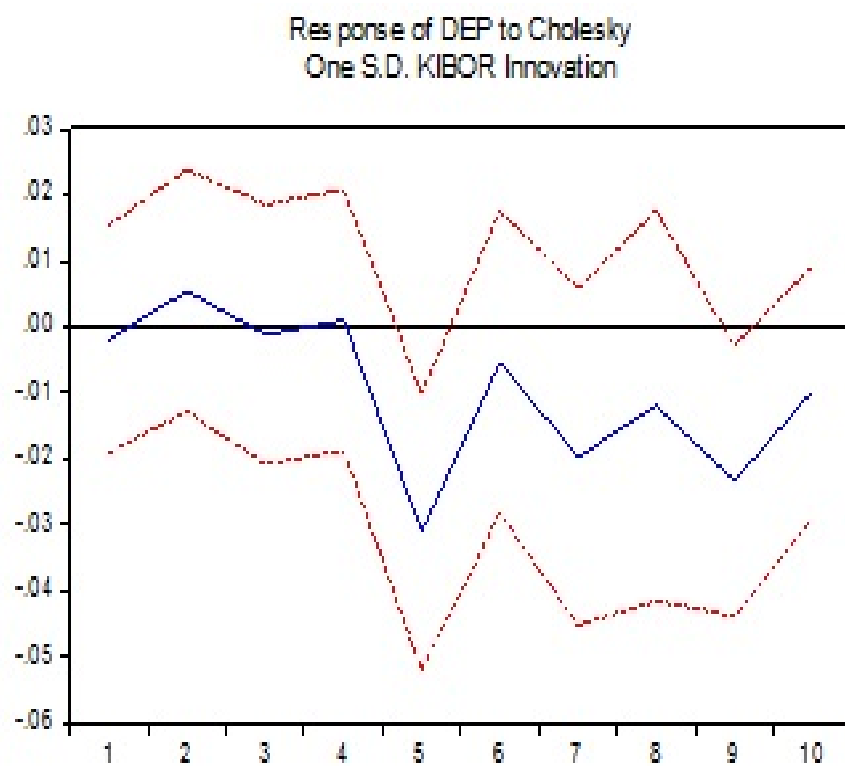


FIGURE 4.14: Response of DEP to KIBOR

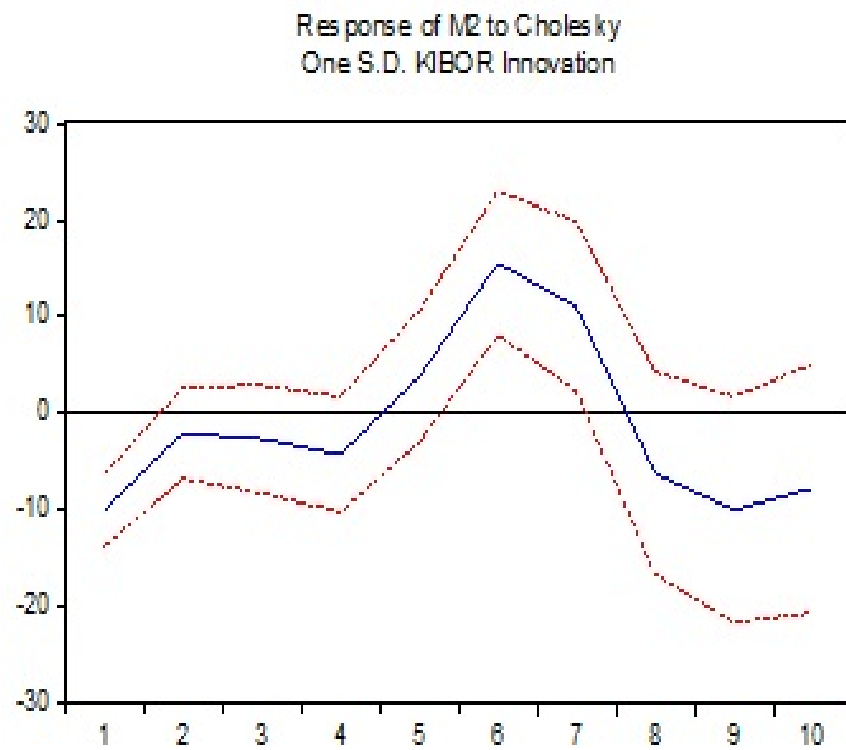


FIGURE 4.15: Response of M2 to KIBOR

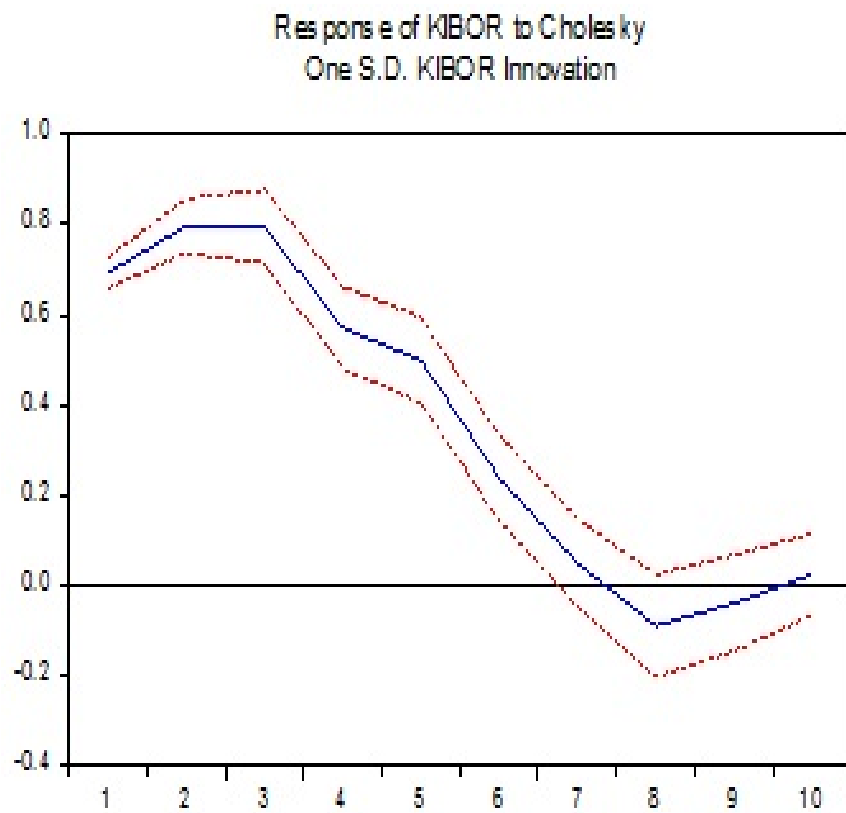


FIGURE 4.16: Response of KIBOR to KIBOR

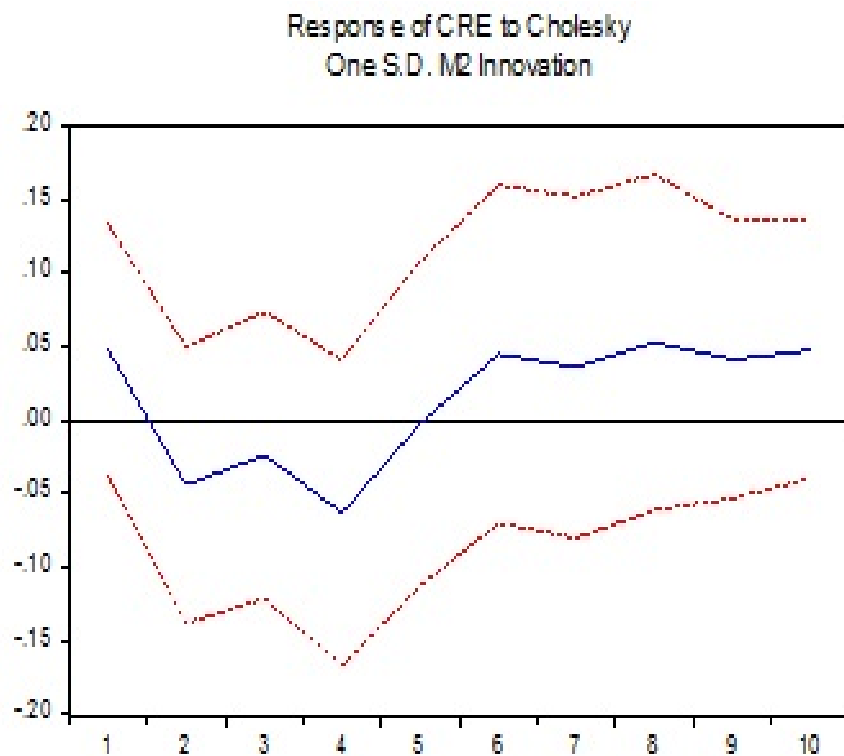


FIGURE 4.17: Response of CRE to M2

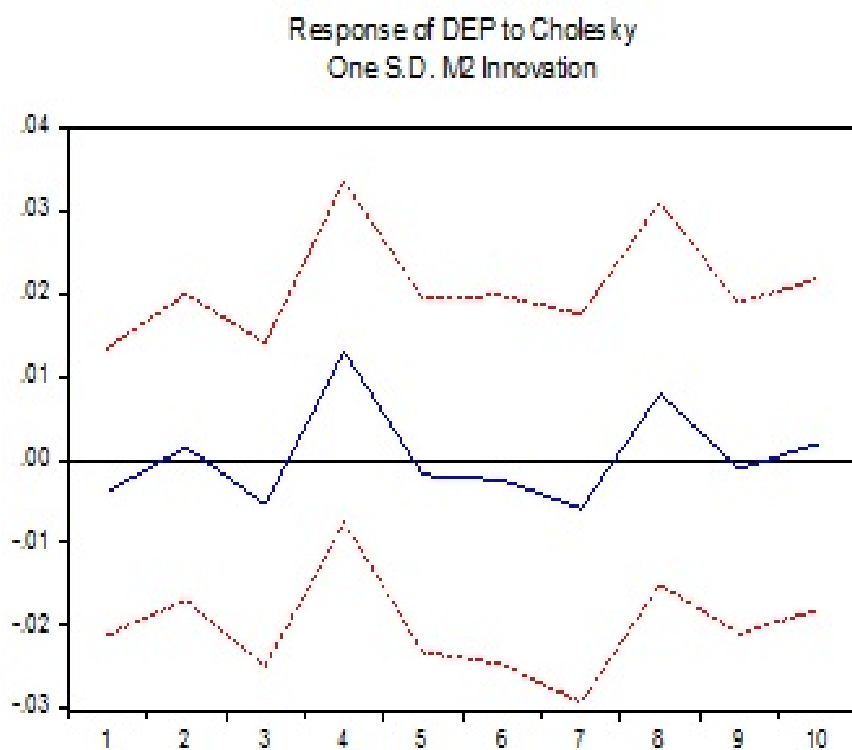


FIGURE 4.18: Response of DEP to M2

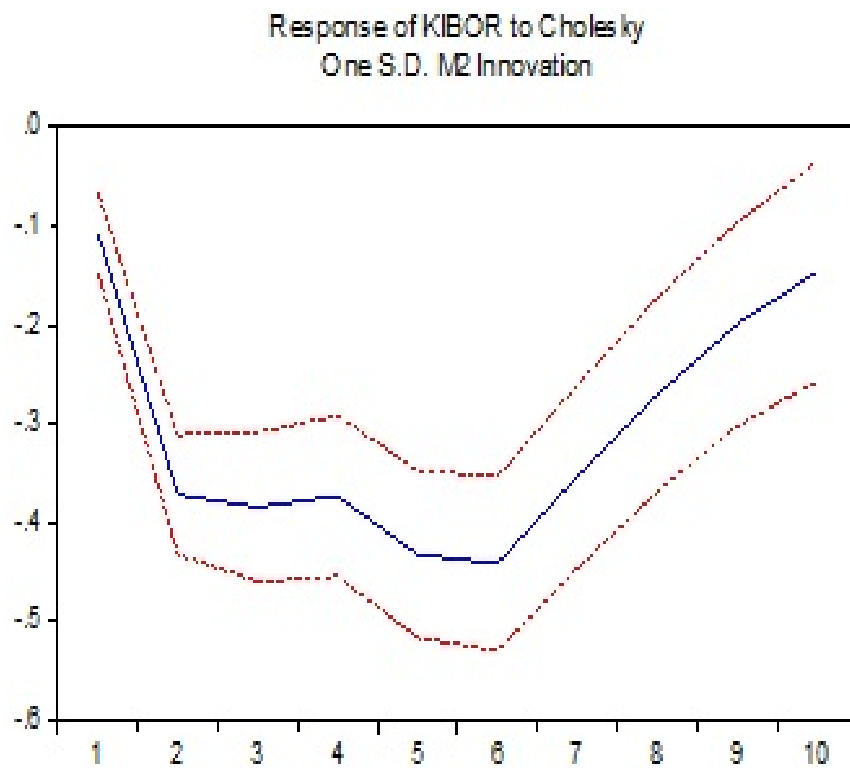


FIGURE 4.19: Response of KIBOR to M2

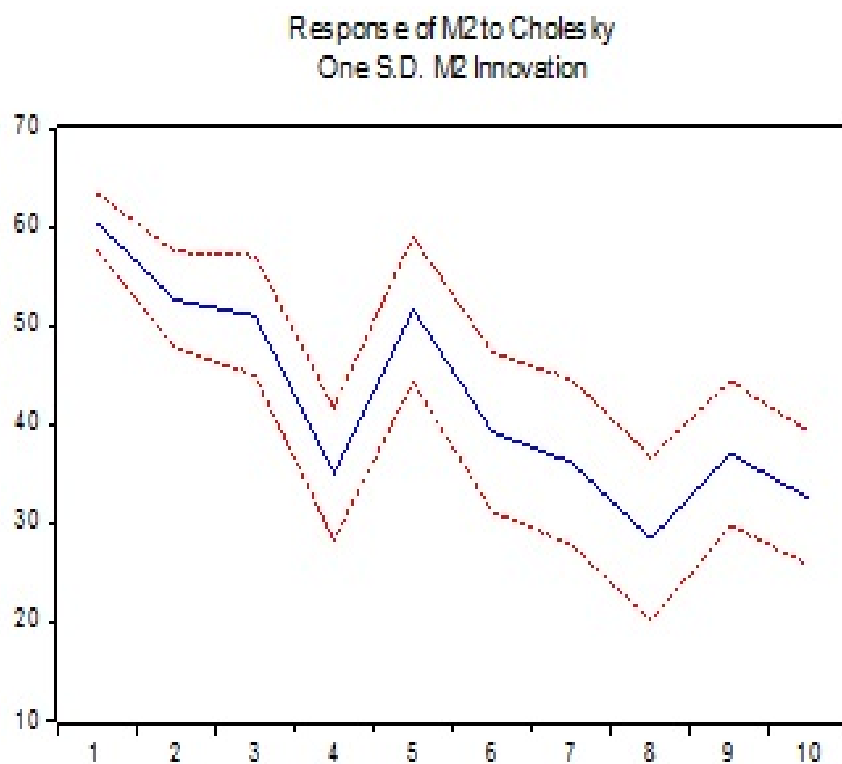


FIGURE 4.20: Response of M2 to M2

## 4.5.2 Impulse Response Functions for Conventional Banks

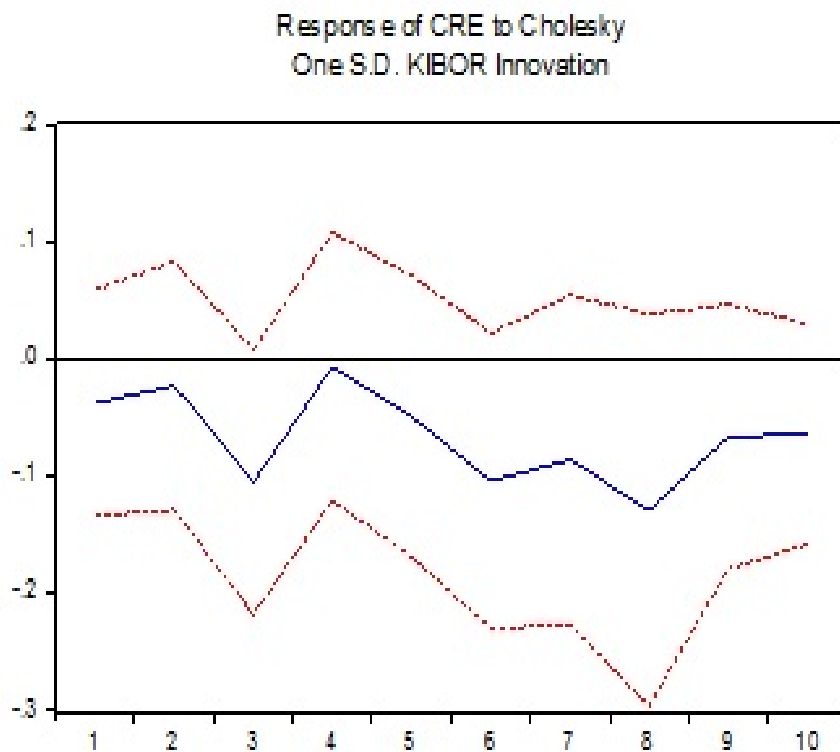


FIGURE 4.21: Response of CRE to KIBOR

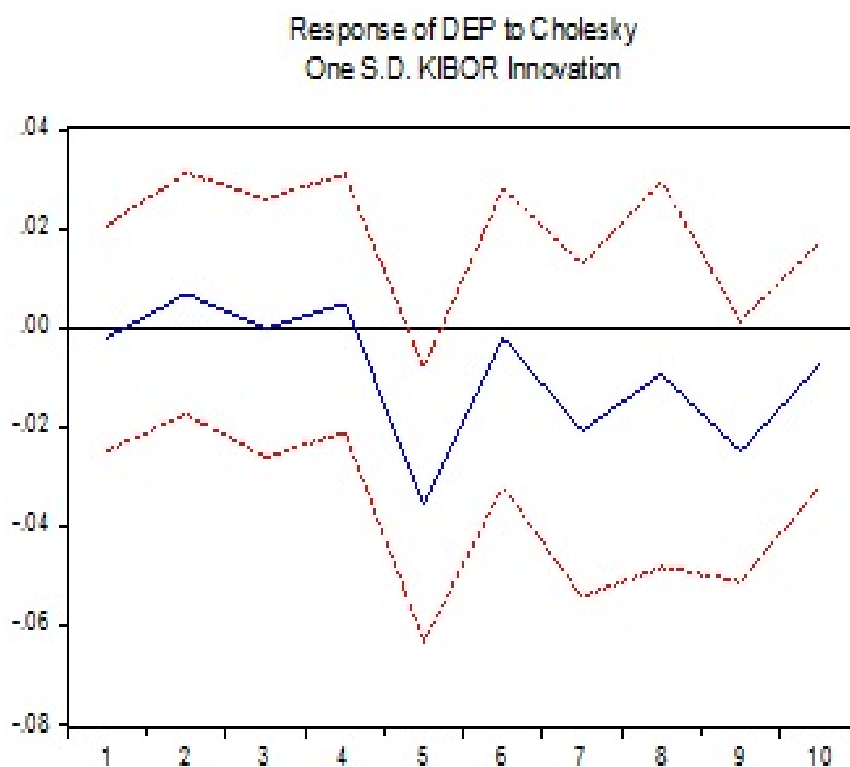


FIGURE 4.22: Response of DEP to KIBOR

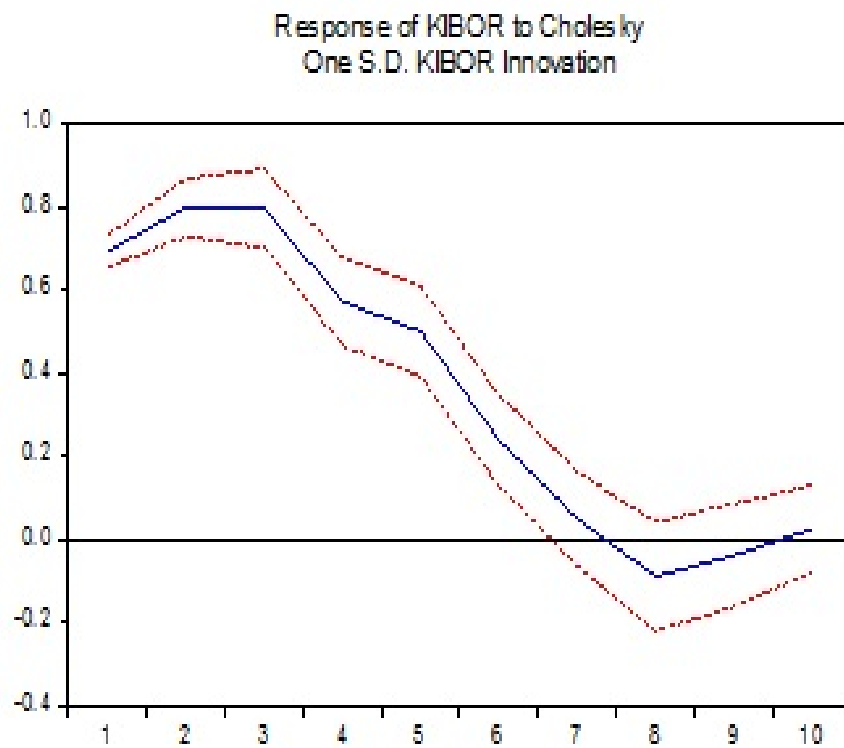


FIGURE 4.23: Response of KIBOR to KIBOR

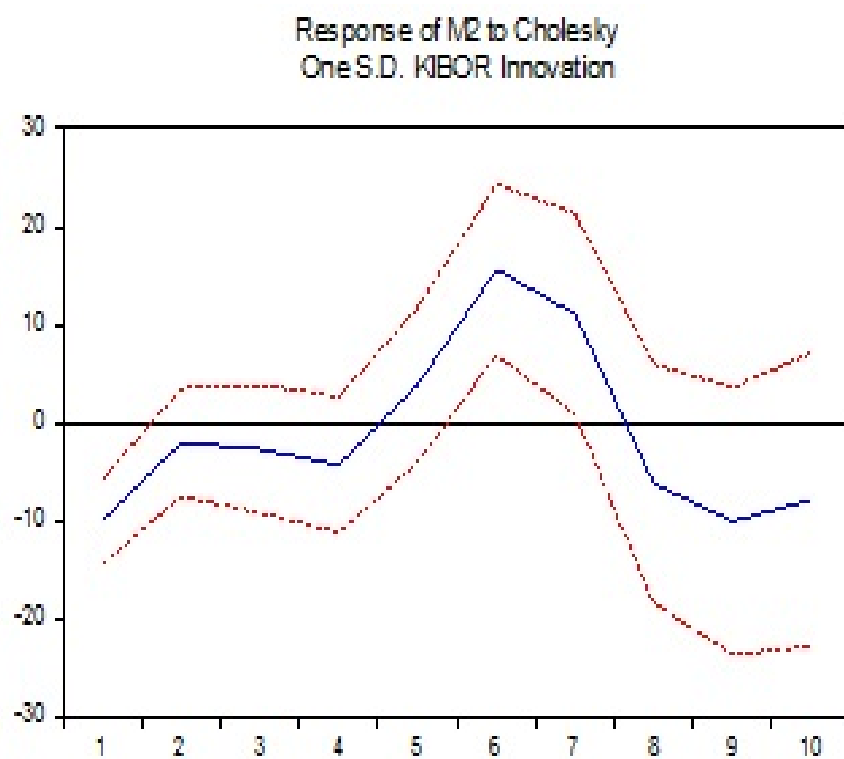


FIGURE 4.24: Response of M2 to KIBOR



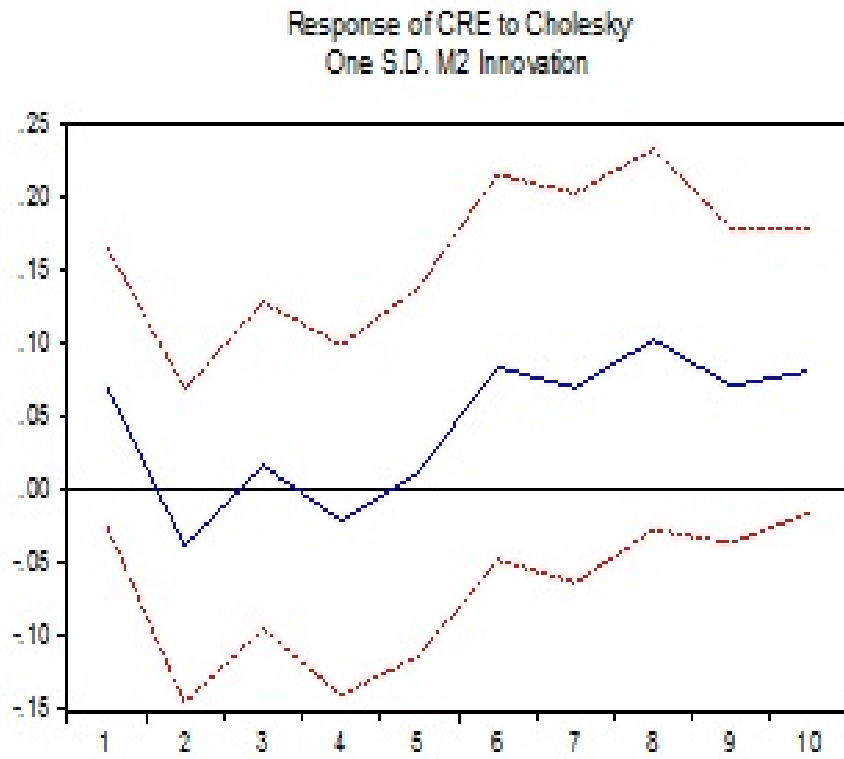


FIGURE 4.25: Response of CRE to M2

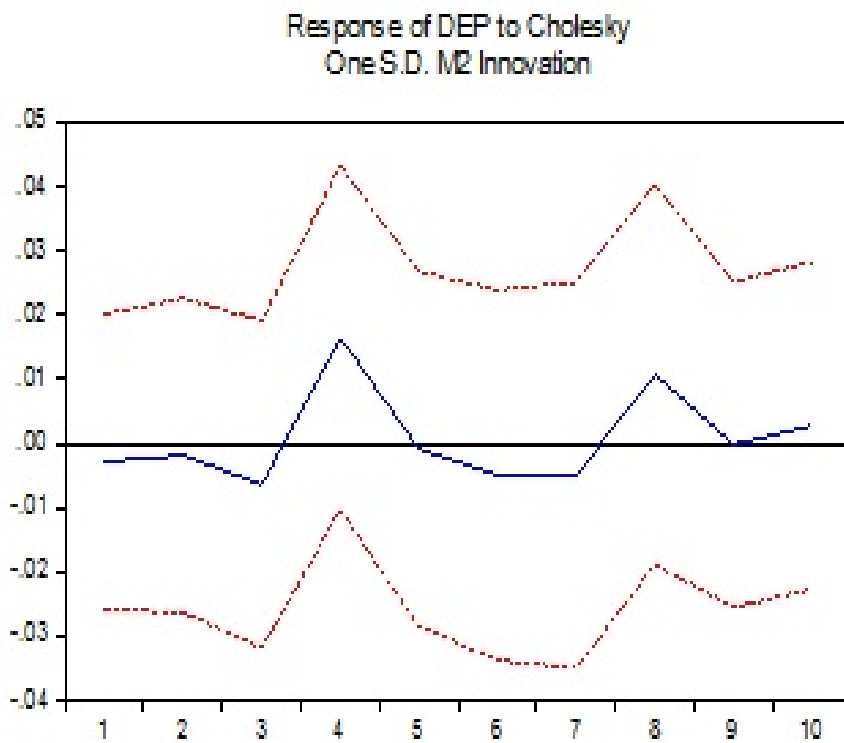


FIGURE 4.26: Response of DEP to M2

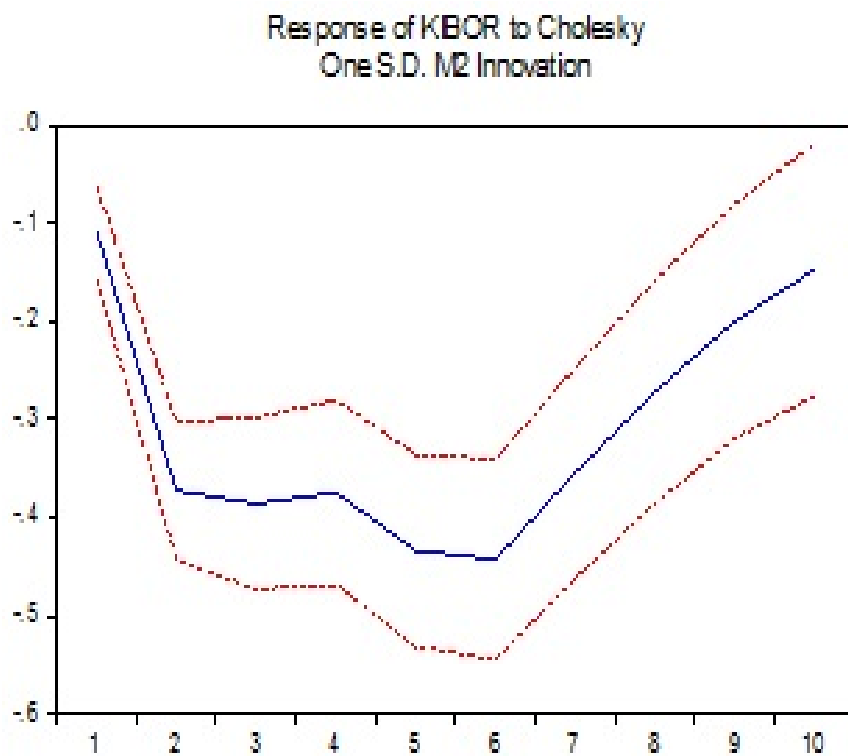


FIGURE 4.27: Response of KIBOR to M2

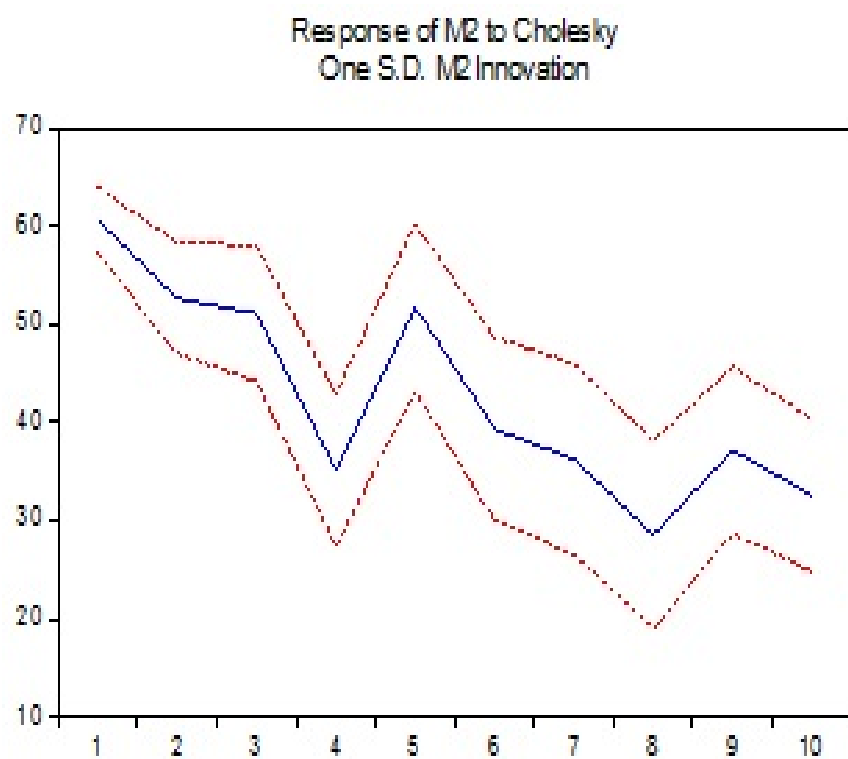


FIGURE 4.28: Response of M2 to M2

### 4.5.3 Impulse Response Functions for Islamic Banks

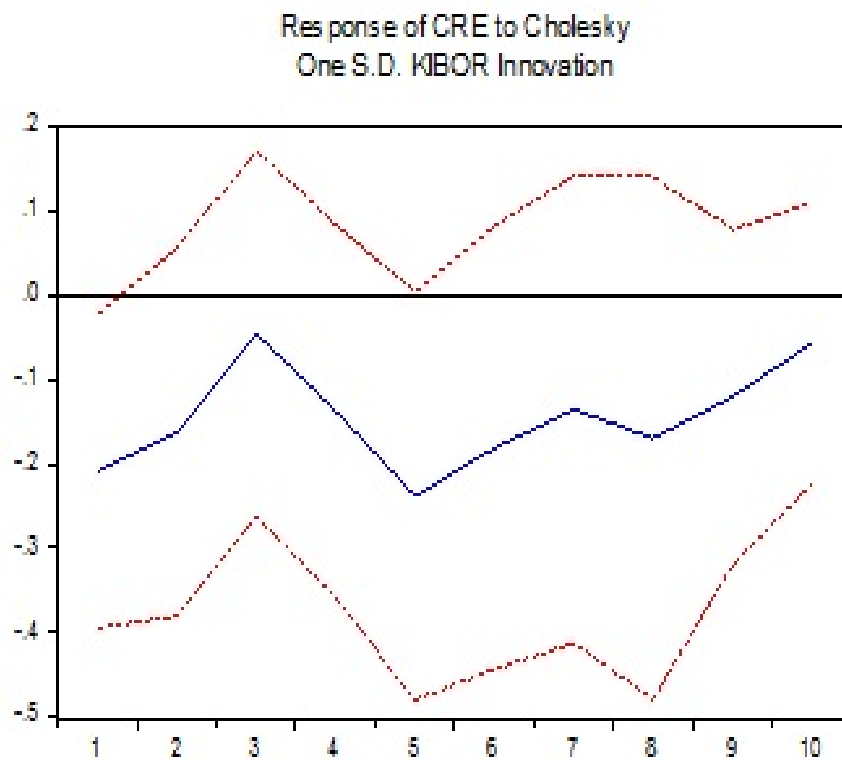


FIGURE 4.29: Response of CRE to KIBOR

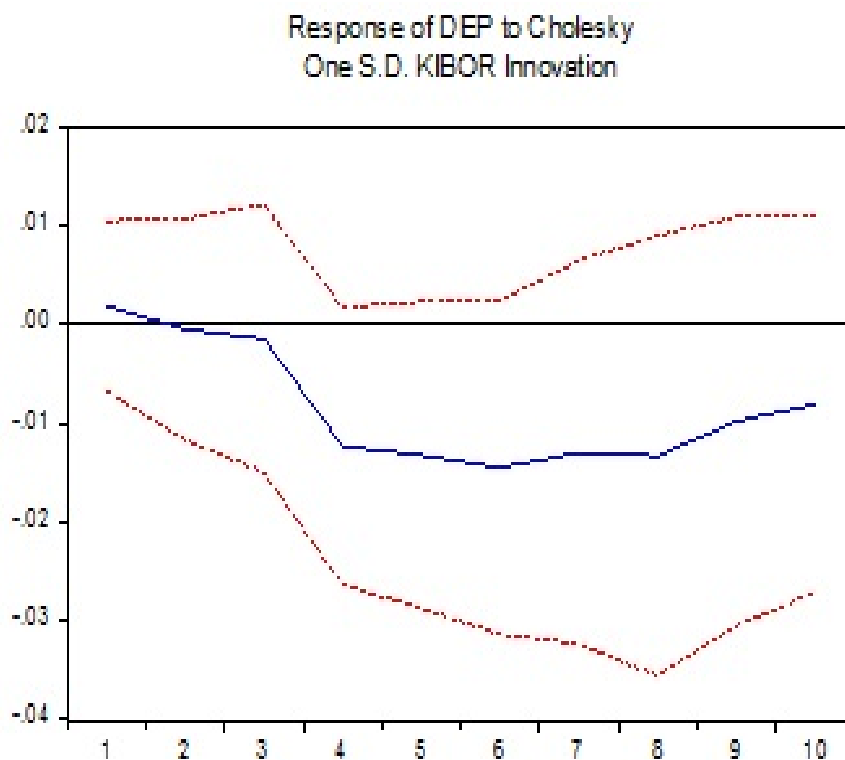


FIGURE 4.30: Response of DEP to KIBOR

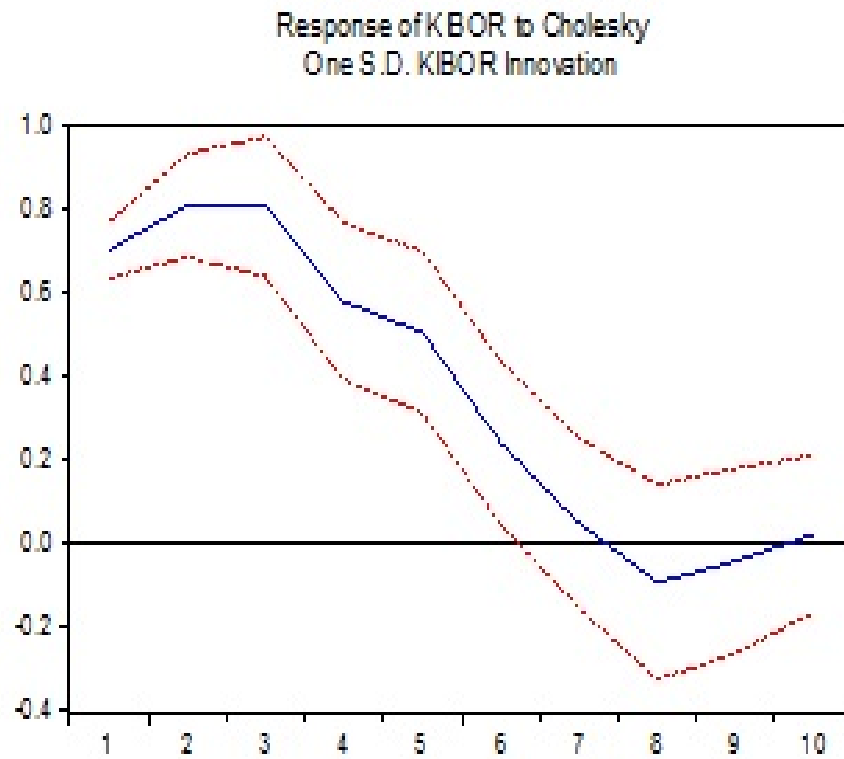


FIGURE 4.31: Response of KIBOR to KIBOR

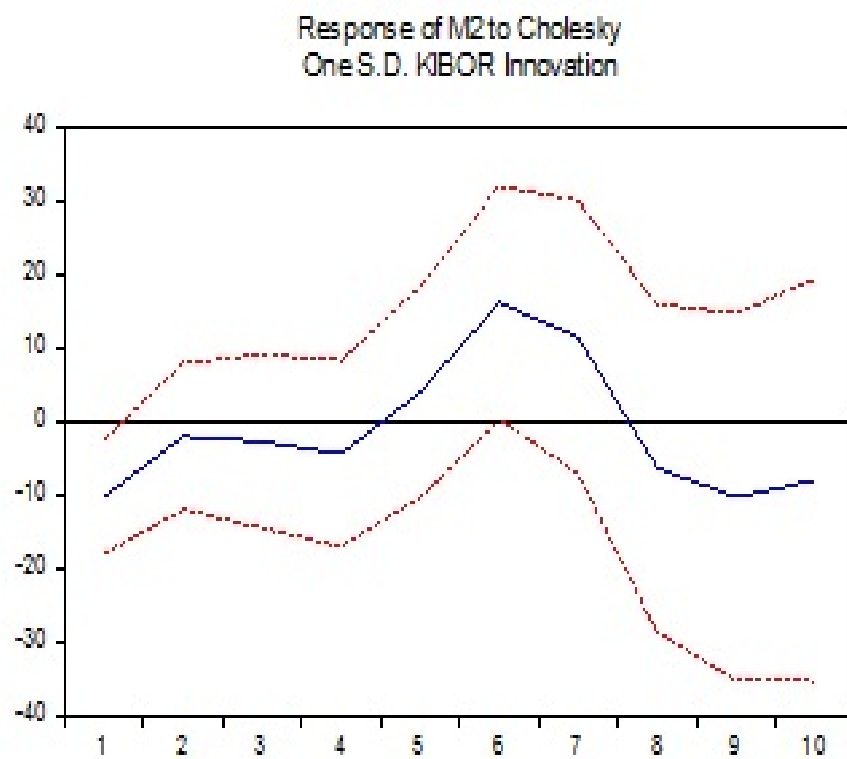


FIGURE 4.32: Response of M2 to KIBOR

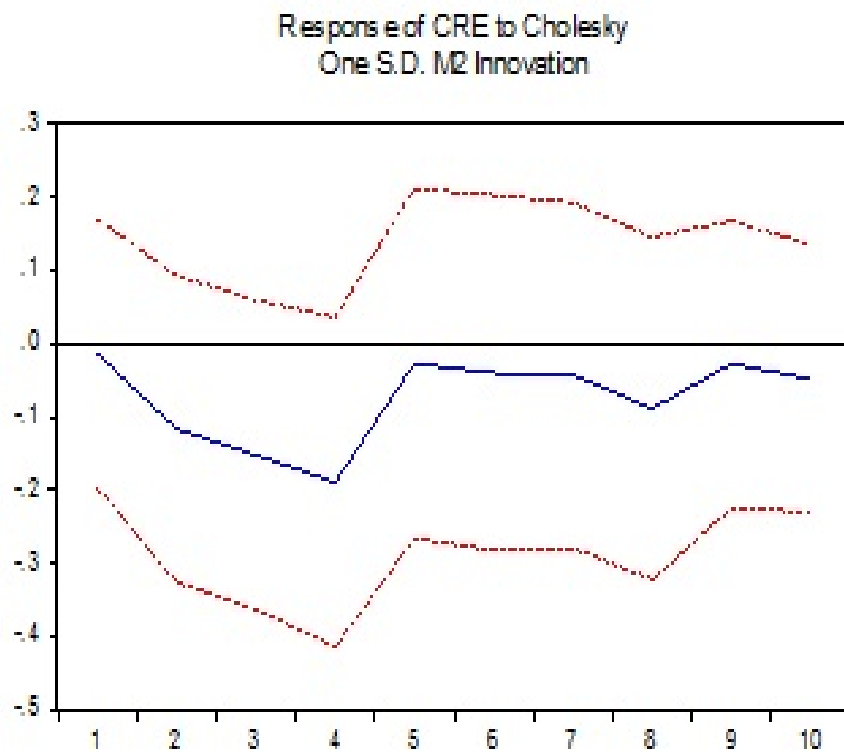


FIGURE 4.33: Response of CRE to M2

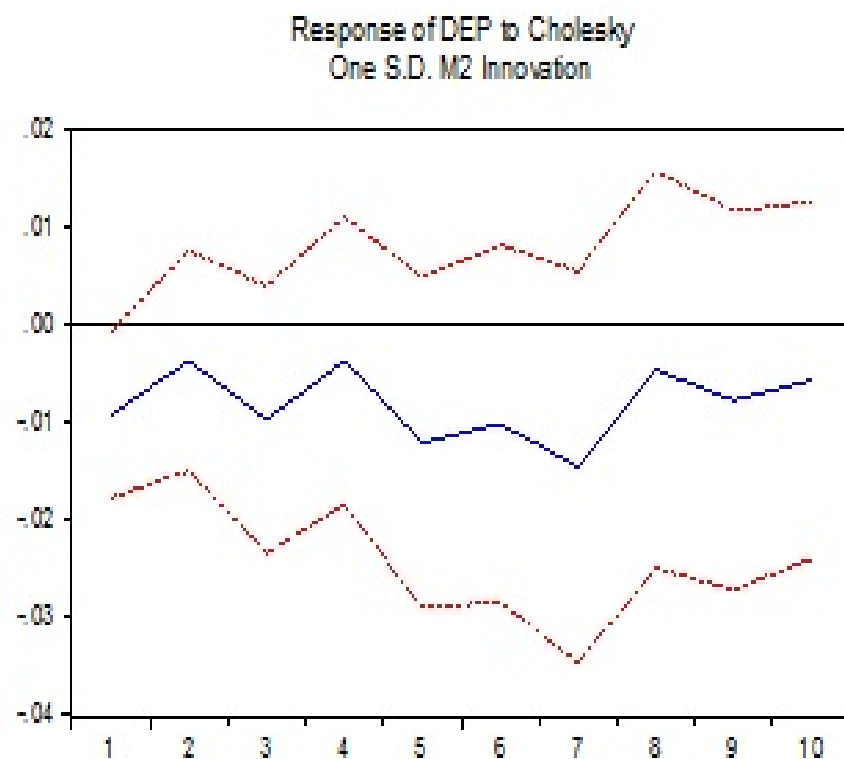


FIGURE 4.34: Response of DEP to M2

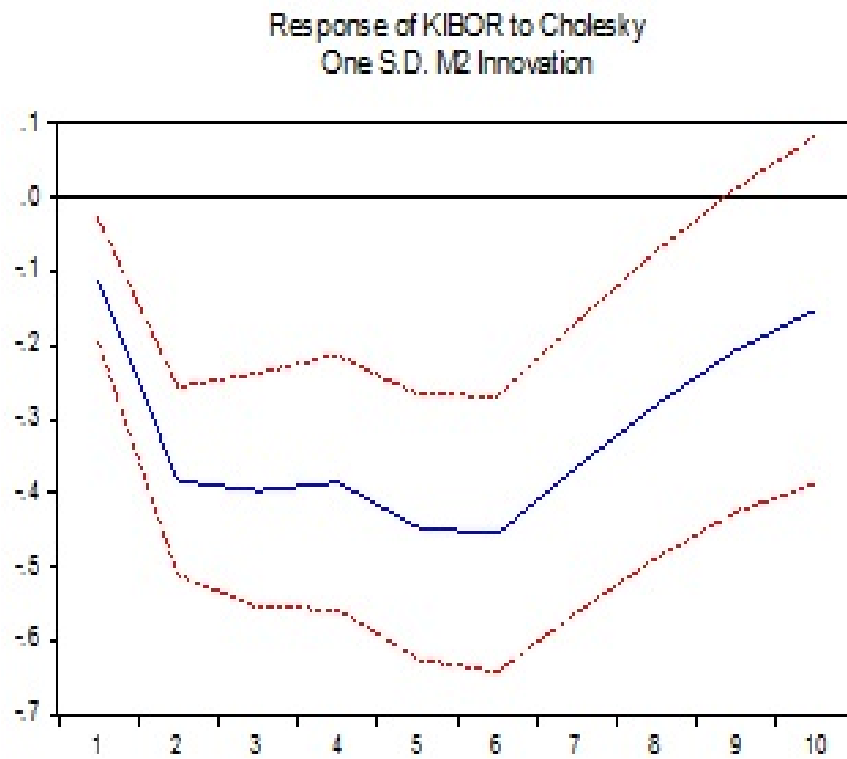


FIGURE 4.35: Response of KIBOR to M2

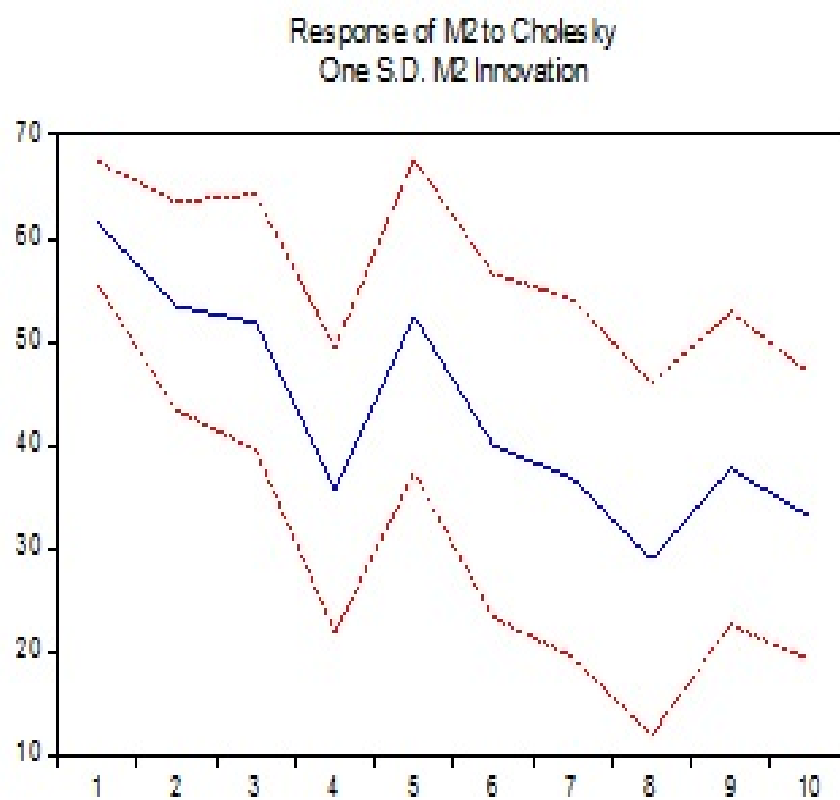


FIGURE 4.36: Response of M2 to M2

Figure 4.13, 4.14, 4.17, 4.18 shows the response of deposits and credits to KIBOR and M2 in overall banking system, credits respond negatively to the KIBOR shock throughout the period whereas, deposits respond positively at the beginning but after four quarters gradually turns into a negative. The response of credit to M2 shock is positive at beginning than turn into negative for three periods and again turns into positive for the whole period. The deposits response to M2 is negative at beginning then after 3 period turns into positive for two periods.

Figure 4.21, 4.22, 4.25, 4.26 shows the response of deposits and credits to KIBOR and M2 in conventional banking system, the response by the conventional banks credits to KIBOR shock is negative. In conventional banks, deposit responds positively for first four quarters than gradually turns into negative. The response of credit to M2 is positive at beginning and turn into negative but after 4th quarter it gradually turns into positive, and deposit to M2 shock is negative at beginning for 3 periods then turn into positive for 2 periods.

Figure 4.29, 4.30, 4.33, 4.34 shows the response of deposits and credits to KIBOR and M2 in Islamic banking system, the response of Islamic bank credit to KIBOR and M2 shock is negative throughout the whole period. Deposits response to KIBOR is positive at beginning but turns into negative and also to M2 shock is negative.

Results presented previously in the number of studies, response of credits and deposits to the KIBOR is consistent. The results of responses that observed are almost the same to the findings by (Kasri & Kassim, 2009; Kassim, Majid, & Yusof, 2009; Haron & Ahmad, 2000; Sukmana & Kassim, 2010; Zainol & Kassim, 2010). Deposits held in the conventional banks increased with an increase in KIBOR. On the other hand, increase in KIBOR negatively affects the deposits held in Islamic banks. The conventional and Islamic bank credits are negatively affected by the KIBOR. Rosly (1999) offered the similar findings of response of the credits.

## 4.6 Variance Decomposition Analysis

To find out the main source of change in each variable, VDC technique is employed.

TABLE 4.8: Variance Decomposition of Credits in Overall Banking System

Period	S.E.	CRE	DEP	KIBOR	M2
1	0.842501	100.0000	0.000000	0.000000	0.000000
2	0.895693	99.79270	0.090622	0.026733	0.089948
3	0.934798	99.00227	0.236846	0.618997	0.141891
4	0.998070	98.78420	0.278403	0.566795	0.370604
5	1.060430	98.90333	0.252309	0.512181	0.332181
6	1.087799	98.41025	0.271367	0.886775	0.431610
7	1.122557	97.93472	0.494011	0.942756	0.628510
8	1.163562	97.06447	0.935628	1.298872	0.701034
9	1.187532	96.63849	1.141419	1.251330	0.968766
10	1.208180	96.38655	1.138129	1.214016	1.261306

TABLE 4.9: Variance Decomposition of Deposits in Overall Banking System

Period	S.E.	CRE	DEP	KIBOR	M2
1	0.247366	0.221136	99.77886	0.000000	0.000000
2	0.257200	0.224854	99.74182	0.018583	0.014741
3	0.269092	0.296708	99.62565	0.063865	0.013780
4	0.285149	0.408778	98.61720	0.096824	0.877195
5	0.305178	0.399755	96.96380	1.770433	0.866016
6	0.321425	0.645934	96.96858	1.604796	0.780690
7	0.337297	0.607157	96.89902	1.773640	0.720179
8	0.349474	0.657937	96.80058	1.680319	0.861168
9	0.361938	0.684052	96.72319	1.734851	0.857902
10	0.375056	0.642721	96.80257	1.707861	0.846844

The **Table 4.8** and **4.9** reveals that the KIBOR and M2 explain the change on credits and deposits in overall banking system. KIBOR explains 0.0276% change and M2 explains 0.0899% change in credits after the first quarter. KIBOR explains 1.2988 in 8th quarter that is highest during whole period. After second quarter, KIBOR explains the higher change in credits throughout the whole period, while M2 explains the higher change in the last period that is 1.2613. On the other hand, KIBOR explains 0.0185% change and M2 explains 0.0147% change in deposits after the first quarter. KIBOR explains 1.7704% change in 5th quarter that is highest during whole period. KIBOR explains the higher change in deposits throughout the whole period.

The **Table 4.10** and **4.11** reveals that the KIBOR and M2 explain the change on credits and deposits in conventional banking system. KIBOR explains 0.0011%



TABLE 4.10: Variance Decomposition of Deposits in Conventional Banking System

Period	S.E.	CCRE	CDEP	KIBOR	M2
1	0.287024	0.035156	99.96484	0.000000	0.000000
2	0.297480	0.076123	99.85442	0.024866	0.044589
3	0.311301	0.137886	99.75036	0.067895	0.043858
4	0.333354	2.095486	96.40849	0.074323	1.421703
5	0.356065	2.467338	93.72410	2.423668	1.384893
6	0.374630	2.245256	94.24339	2.215700	1.295655
7	0.395505	3.494096	92.54260	2.767045	1.196264
8	0.412965	4.774888	91.08348	2.817780	1.323853
9	0.427501	4.629634	91.05091	2.993097	1.326361
10	0.444435	4.931204	90.64426	3.158932	1.265599

TABLE 4.11: Variance Decomposition of Credits in Conventional Banking System

Period	S.E.	CCRE	CDEP	KIBOR	M2
1	0.786801	100.0000	0.000000	0.000000	0.000000
2	0.832666	99.95323	0.007431	0.001144	0.038197
3	0.875632	98.43064	0.198196	1.308805	0.062355
4	0.915322	98.44399	0.206039	1.239872	0.110104
5	0.944388	98.51994	0.196825	1.168015	0.115224
6	0.959886	97.02534	0.296136	2.155229	0.523298
7	0.975613	95.51651	0.838895	2.389809	1.254785
8	1.001328	92.20697	1.700891	4.012150	2.079985
9	1.020933	90.13291	2.564458	4.074119	3.228515
10	1.038009	87.97235	2.581009	4.563587	4.883057

change and M2 explains 0.0381% change in conventional credits after the first quarter. M2 explains 4.8830% in last period that is highest during whole period. After second quarter, KIBOR explains the higher change in conventional credits throughout the whole period, while M2 explains the higher change in the last period that is 4.8803. On the other hand, KIBOR explains 0.00248% change and M2 explains 0.0445% change in conventional deposits after the first quarter. KIBOR explains 3.1589% change in last period that is highest during whole period. KIBOR explains the higher change in conventional deposits after 4th period.

The **Table 4.12** and **4.13** reveals that the KIBOR and M2 explain the change on credits and deposits in Islamic banking system. KIBOR explains 0.4723%

TABLE 4.12: Variance Decomposition of Deposits in Islamic Banking System

<b>Variance Decomposition of IDEP:</b>					
<b>Period</b>	<b>S.E.</b>	<b>ICRE</b>	<b>IDEP</b>	<b>KIBOR</b>	<b>M2</b>
<b>1</b>	0.037212	9.638442	90.36156	0.000000	0.000000
<b>2</b>	0.045907	11.98318	85.96904	0.052596	1.995183
<b>3</b>	0.057083	16.86217	81.13685	0.034036	1.966947
<b>4</b>	0.066410	26.18483	69.55109	0.798022	3.466061
<b>5</b>	0.082054	28.25839	66.88807	1.590710	3.262835
<b>6</b>	0.091617	31.31586	62.66942	1.285117	4.729603
<b>7</b>	0.100257	33.44917	60.18319	1.376739	4.990905
<b>8</b>	0.108950	38.16776	54.02248	2.211952	5.597808
<b>9</b>	0.117398	38.58434	53.81170	2.240984	5.362971
<b>10</b>	0.124483	39.75710	52.19358	2.818708	5.230612

TABLE 4.13: Variance Decomposition of Credits in Islamic Banking System

<b>Variance Decomposition of ICRE:</b>					
<b>Period</b>	<b>S.E.</b>	<b>ICRE</b>	<b>IDEP</b>	<b>KIBOR</b>	<b>M2</b>
<b>1</b>	0.983880	100.0000	0.000000	0.000000	0.000000
<b>2</b>	1.057446	97.74318	1.722683	0.472316	0.061826
<b>3</b>	1.081700	96.82136	1.991490	0.611657	0.575492
<b>4</b>	1.208651	95.95463	2.504925	0.982353	0.558094
<b>5</b>	1.325361	95.92470	2.531153	0.817534	0.726614
<b>6</b>	1.361240	95.20449	2.423150	0.920266	1.452090
<b>7</b>	1.398102	94.77936	2.346504	1.364269	1.509865
<b>8</b>	1.464865	94.20344	2.138144	2.152300	1.506111
<b>9</b>	1.500595	92.13752	2.275240	4.147194	1.440043
<b>10</b>	1.534788	89.44165	2.197209	6.730814	1.630332

change and M2 explains 0.0618% change in Islamic credits after the first quarter. KIBOR explains 6.7308% in last period that is highest during whole period. After first quarter, KIBOR explains the higher change in Islamic credits throughout the whole period, while M2 explains the higher change in the 6th and 7th period. On the other hand, KIBOR explains 0.0525% change and M2 explains 1.9951% change in Islamic deposits after the first quarter. M2 explains 5.5978% change in 8th period that is highest during whole period. M2 explains the higher change in Islamic deposits throughout the whole period.

VDC reveal that the KIBOR and M2 explain the change in overall banking system and conventional and Islamic banks' credit and deposit. The KIBOR explain

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the higher change in Islamic bank credit than banking system and conventional banks. The highest value that explains change is 1.29 for banking system, 4.88 for conventional banks and 6.73 for Islamic bank credits. For deposits, the higher change is 1.77 in banking system, 3.15 in conventional banks and 5.59 in Islamic banks. To explain the change in conventional banks credits and Islamic banks deposits M2 appear to be stronger. For that reason, credits of conventional banks are more affected by M2 as compare to the deposits and Islamic banks deposits are more affected by M2 than credits.

# Chapter 5

## Discussion and Conclusion

This chapter explains the conclusion, recommendations, limitations and future directions for the further studies.

### 5.1 Conclusion and Policy Recommendation:

There are number of studies that discuss the differences between Islamic and conventional banking system. Other studies explored the behavior of conventional banks lending but due to the lack of bank level data studies on the financing behavior of Islamic banks remain limited. This study investigates the deposits and credits response to KIBOR and M2 held at Islamic and conventional banks based on the Panel VAR model by using the quarterly data for the period of 2007:Q1 to 2017:Q4. In dual banking system, Islamic banks played a dominant role that's why it is important to understanding this transmission mechanism.

Our results focus of the credits and deposits response to monetary shocks in dual banking system. The results reveal that deposits and credits of conventional as well as Islamic banks respond to the monetary shocks. The hypotheses of the study are accepted that monetary policy has an impact on lending and depositing behavior of conventional and Islamic banks in Pakistan and response of Islamic banks is higher to monetary shocks. Deposits held in the conventional banks increased with an increase in KIBOR. On the other hand, increase in KIBOR negatively affects

the deposits held in Islamic banks. The credits of Islamic and conventional banks are negatively affected by the KIBOR.

This study provides information that why Islamic bank lending channel works differently from conventional bank lending. The findings are related to the credits and deposits in dual banking system. The main findings of our study reveal that the change in the KIBOR and M2 not only affects the credits and deposits of conventional banks but also to the Islamic banks credits and deposits. The findings of this study are consistent with the findings explored by (Haron & Ahmad, 2000; Rosly, 1999; Kasri & Kassim, 2009; Zainol & Kassim, 2010). While, the argument and assumption that Islamic banks are interest free and construct a positive contribution to financial stability attainment that's why are more stable as compare to conventional banks is partially invalid. It should be taken an account the Islamic banks susceptibility to KIBOR for a successful design of monetary policy. While, In Islamic banks and also in conventional banks the risk management is importantly relevant. Religiosity is normally linked with higher risk aversion and against a positive monetary shock that may be lead toward larger withdrawal of deposits. Moreover, deposits funding makes the Islamic banks more responsive to monetary shock because they highly dependent on deposit funding. In Islamic banking, prohibition of interest rate prevents to Islamic banks to adjust the deposit rate quickly. On the other hand, through delay in which deposits withdrawal by depositors or indirect manipulations Islamic banks only can change their deposits rates. Dissimilar to the theoretical expectations, the fact suggesting that KIBOR influences the Islamic banks and Islamic banks are also facing a serious risk of interest rate.

Many important question raises to policy makers and academics due to the fast and large growth of Islamic banking system for example; is there any change in transmission mechanism of monetary policy by bank lending channel if Islamic banking system becomes larger significantly. The lending channel of banks significantly depends on central bank's ability to affect the loan supply of banks. For that reason, it matters a lot either bank perfectly attract deposits at interest

rates and consider the loans securities and granted held in portfolio as a perfect substitute.

For regulators, it is important to understand that either Islamic bank has some unintentional side effects and desired outcomes on real economy and financial stability because of the highly growth expectations worldwide for Islamic banking system. This study helps policy makers to manage the economy in a smoother way because it reveals that through Islamic banks monetary transmission is more effective.

## **5.2 Limitations**

Although this study gives the extensive understanding on the transmission mechanism of bank lending channel under dual banking system, but this study is only limited to Pakistan and does not covers the all aspects. This study is a country specific because it is only limited to the Pakistan.

## **5.3 Future Direction**

In future, study can be conducted by contrast the lending behavior with other Islamic countries and economies and could be add some other feature that can affect the transmission mechanism of bank lending channel e.i size, liquidity, amount of capital, growth etc.

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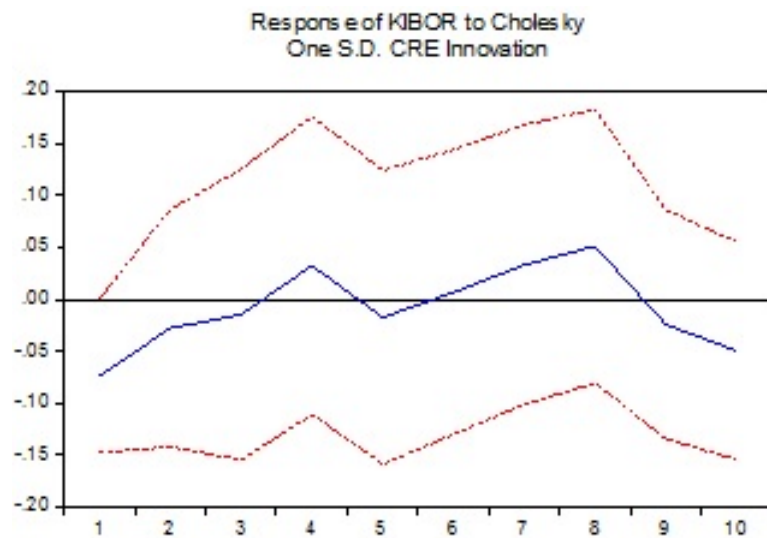
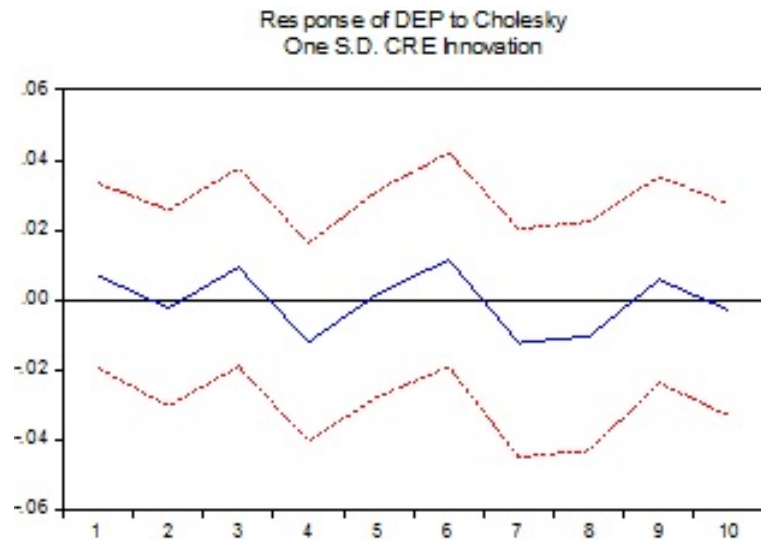
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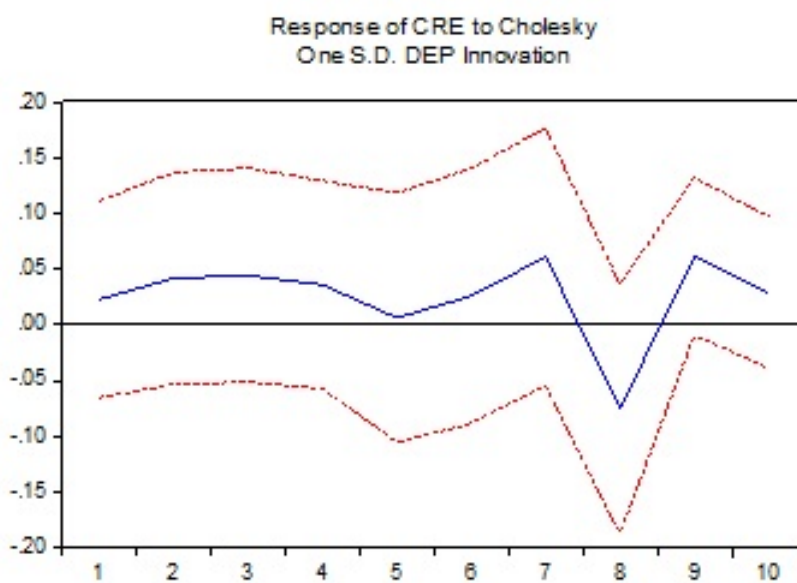
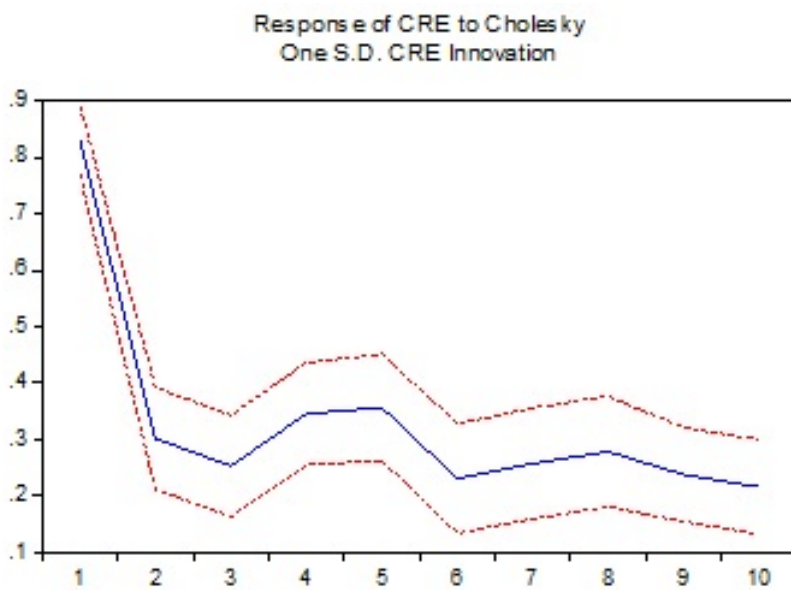
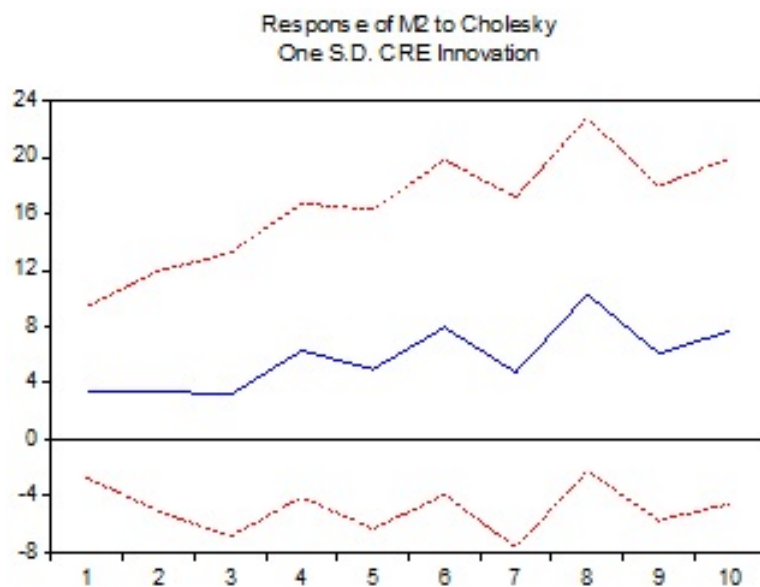
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# Appendix-A

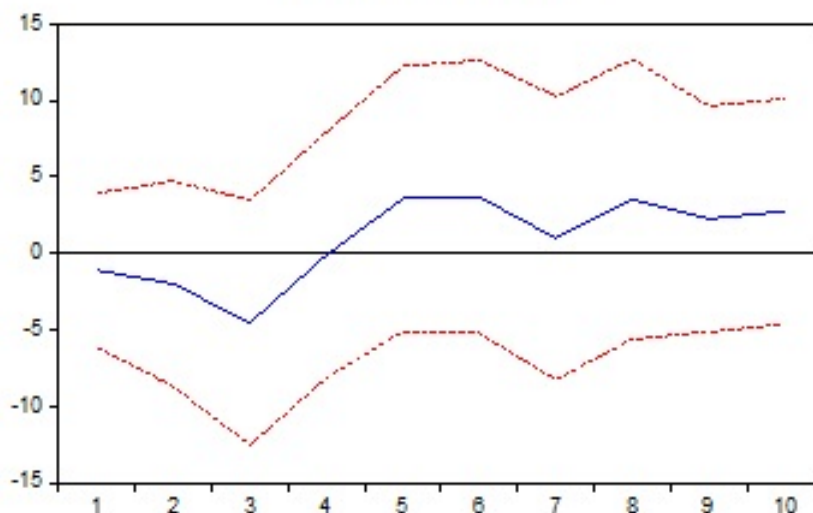
## Impulse Response Functions

### Overall Banking System

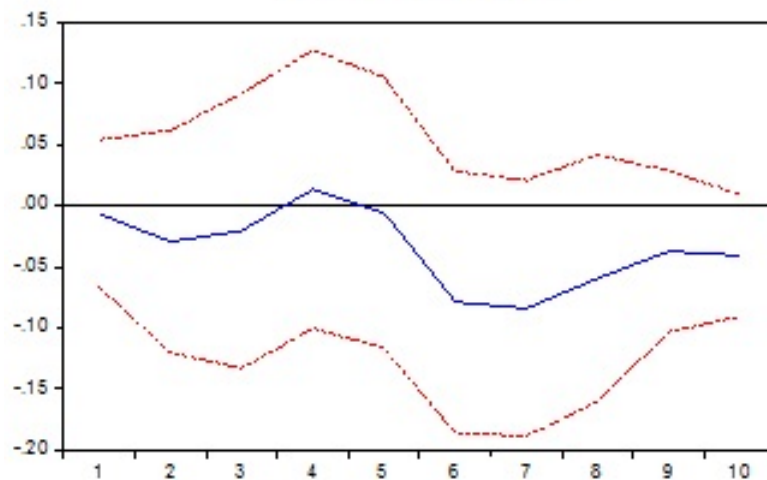




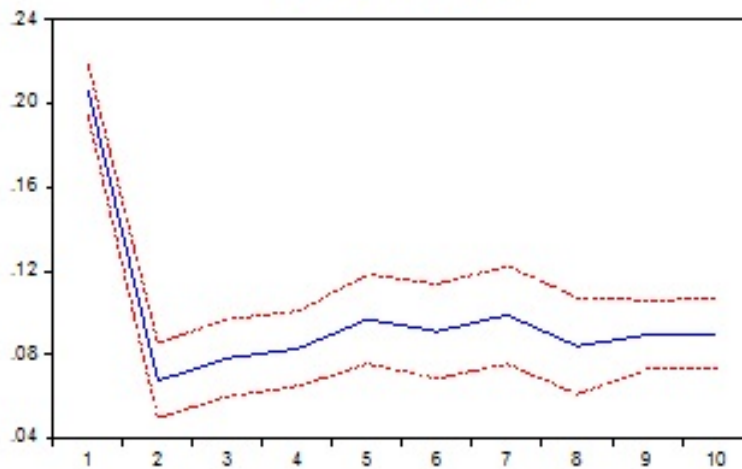
Response of M2 to Cholesky  
One S.D. DEP Innovation



Response of KIBOR to Cholesky  
One S.D. DEP Innovation

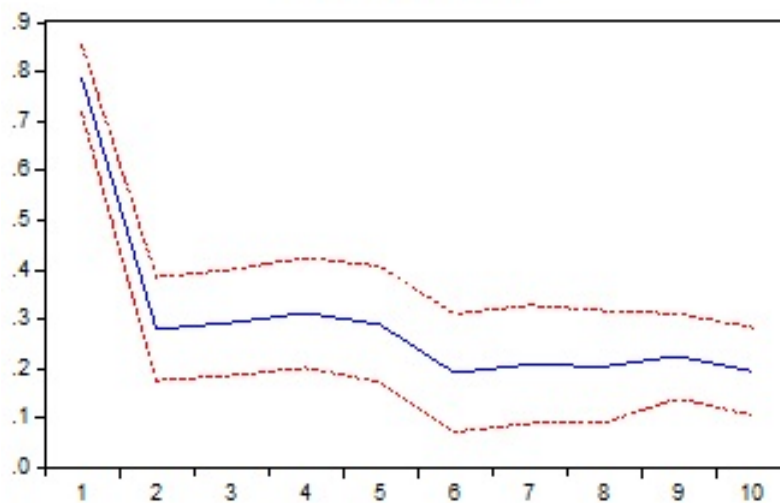


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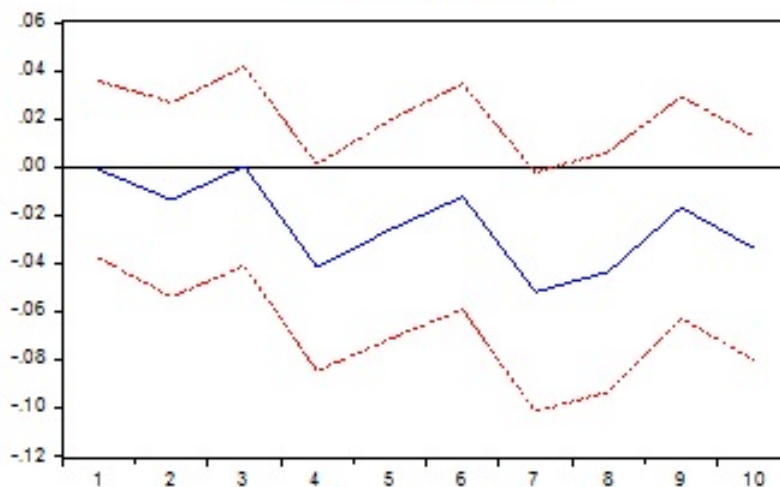


## Conventional Banking System

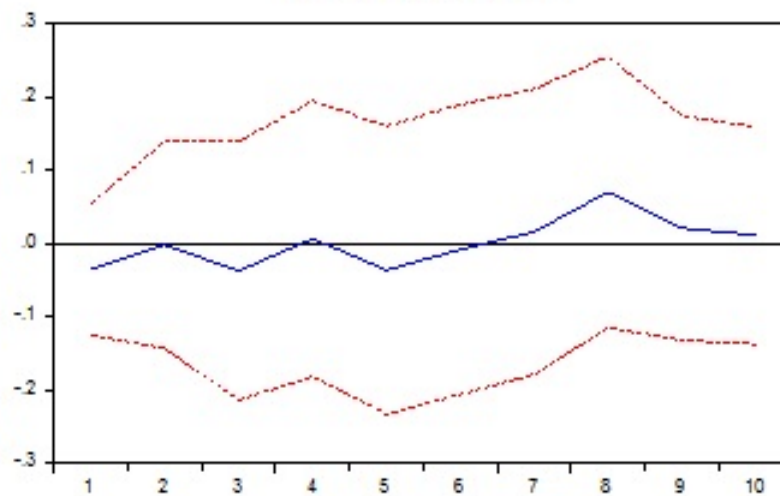
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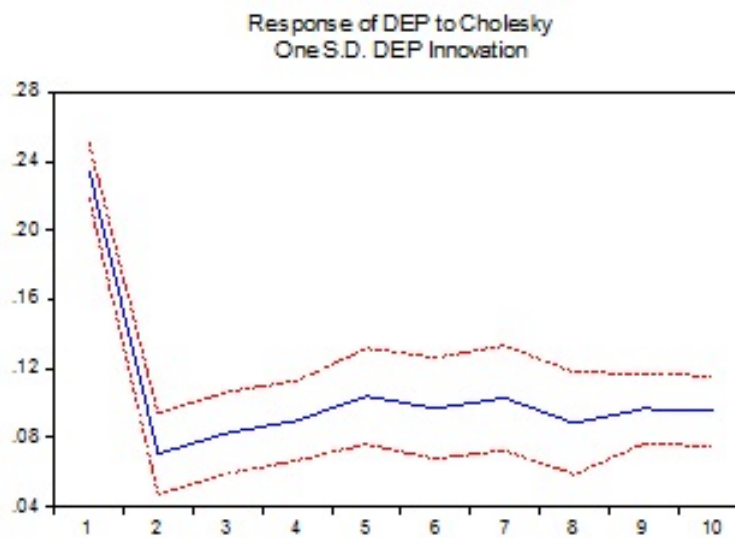
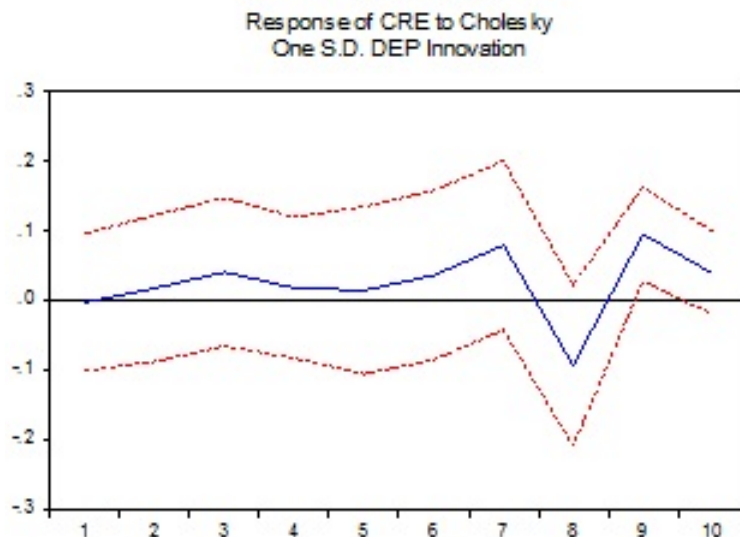
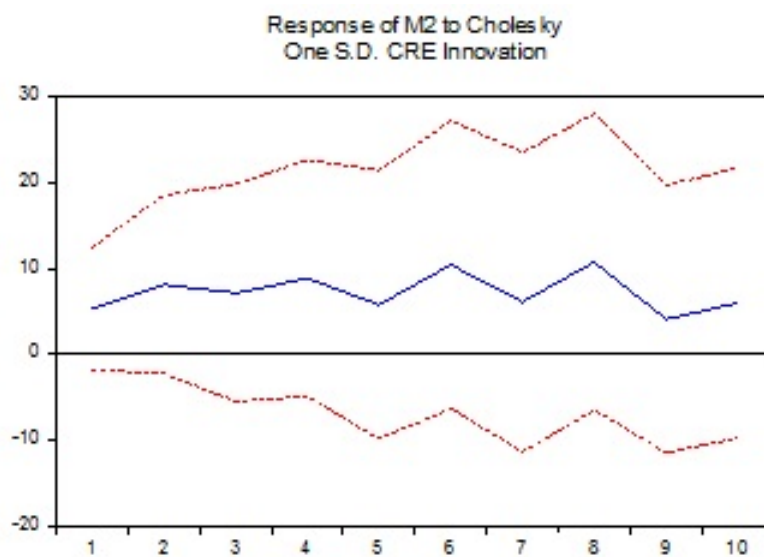


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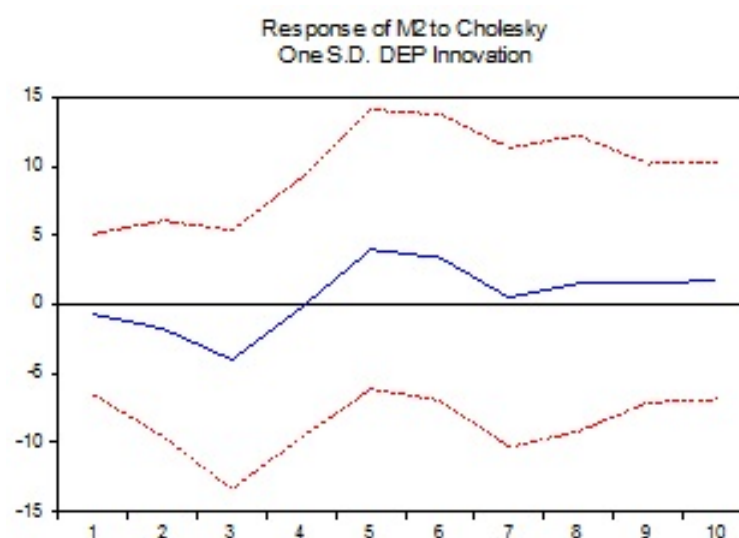
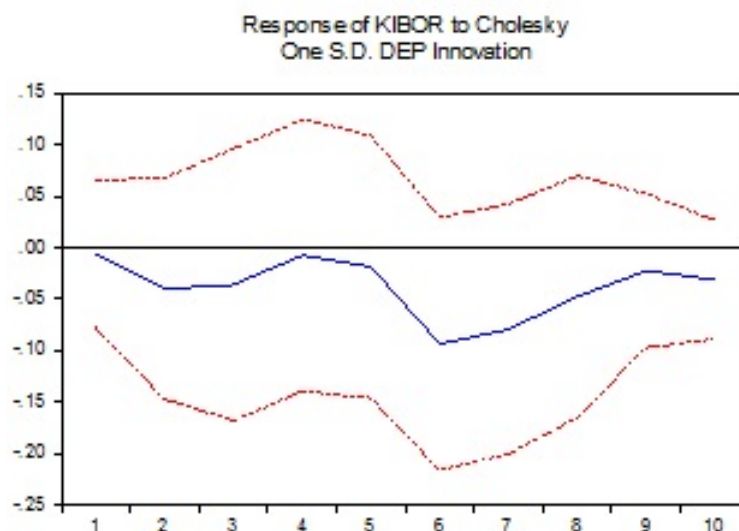


Response of KIBOR to Cholesky  
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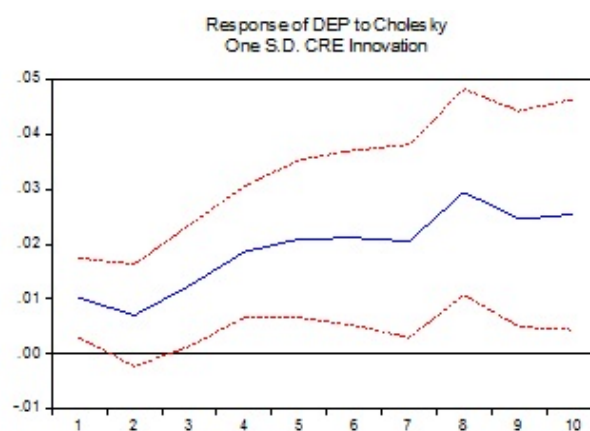




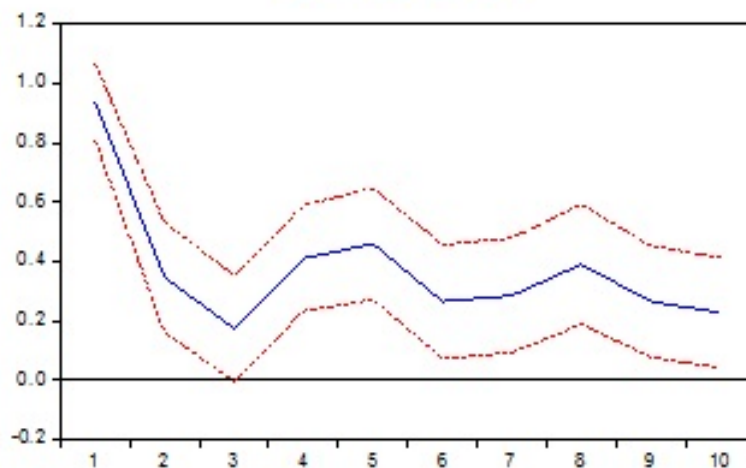




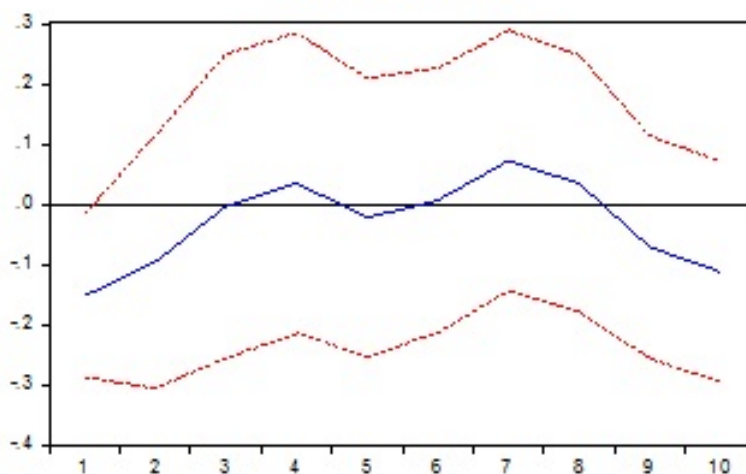
## Islamic Banking System



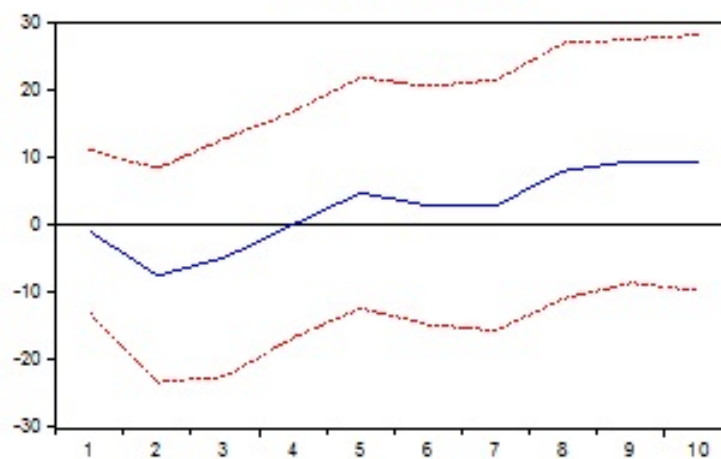
Response of CRE to Cholesky  
One S.D. CRE Innovation



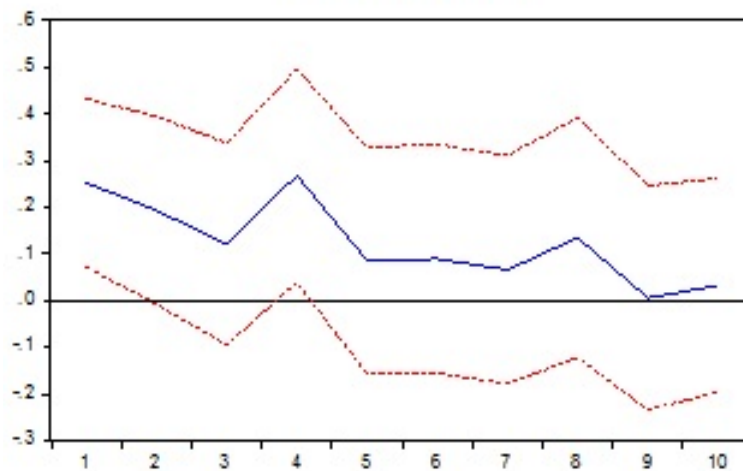
Response of KIBOR to Cholesky  
One S.D. CRE Innovation



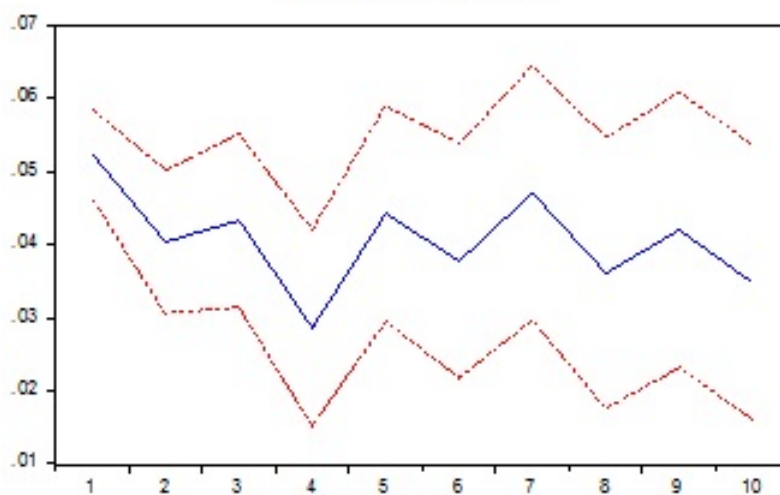
Response of M2 to Cholesky  
One S.D. CRE Innovation



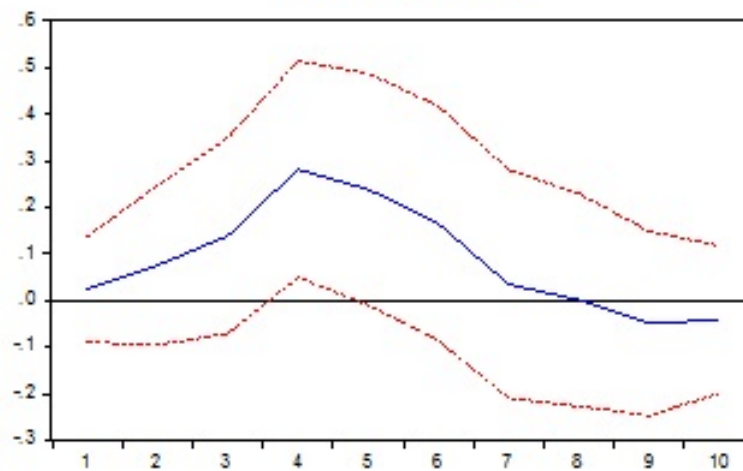
Response of CRE to Cholesky  
One S.D. DEP Innovation

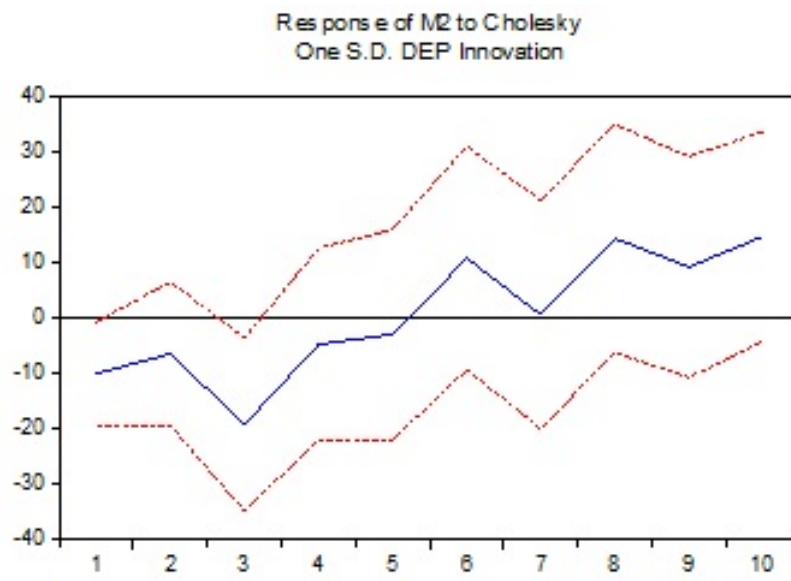


Response of DEP to Cholesky  
One S.D. DEP Innovation



Response of KIBOR to Cholesky  
One S.D. DEP Innovation





# Appendix-B

## Variance Decomposition Analysis

Variance Decomposition of KIBOR in Overall Banking System

Period	S.E.	CRE	DEP	KIBOR	M2
1	0.632056	1.481532	0.023412	98.49506	0.000000
2	0.955606	1.041494	0.052310	91.96551	6.940689
3	1.180479	1.055434	0.068647	87.67047	11.20545
4	1.270819	0.919386	0.063176	80.80111	18.21633
5	1.352787	0.900491	0.060841	73.40245	25.63622
6	1.428160	0.832503	0.330884	65.86853	32.96808
7	1.484954	0.770762	0.619767	61.76252	36.84695
8	1.534940	0.727244	0.710911	59.68944	38.87240
9	1.557108	0.772813	0.753481	58.46548	40.00823
10	1.572053	0.972138	0.775054	57.74697	40.50584

Variance Decomposition of M2 in Overall Banking System

Period	S.E.	CRE	DEP	KIBOR	M2
1	52.46211	0.644671	0.299060	3.056688	95.99958
2	69.42782	0.520125	0.431116	2.027733	97.02103
3	83.46327	0.366190	0.303196	1.797079	97.53354
4	89.43559	0.544461	0.308496	2.058160	97.08888
5	103.4122	0.490808	0.738873	3.449479	95.32084
6	112.3740	0.666358	0.872877	7.508288	90.95248
7	120.3710	0.605275	0.993959	9.233016	89.16775
8	124.5447	0.974754	0.982555	8.640618	89.40207
9	130.5373	1.156468	1.118732	7.996719	89.72808
10	134.6861	1.502905	1.116946	7.654495	89.72565

## Variance Decomposition of KIBOR in Conventional Banking

Period	S.E.	CCRE	CDEP	KIBOR	M2
1	0.647321	0.054160	0.157303	99.78854	0.000000
2	0.959974	0.025450	0.074384	93.37652	6.523643
3	1.164051	0.062959	0.091802	89.20276	10.64248
4	1.248256	0.147594	0.094186	81.07359	18.68463
5	1.335092	0.151740	0.084034	72.05556	27.70867
6	1.427747	0.149007	0.498978	63.07011	36.28191
7	1.502671	0.175428	0.893447	58.51149	40.41964
8	1.570265	0.282599	0.987740	56.00153	42.72813
9	1.601324	0.275056	0.985398	54.36349	44.37605
10	1.623944	0.271311	0.962567	53.72631	45.03981

## Variance Decomposition of M2 in Conventional Banking System

Period	S.E.	CCRE	CDEP	KIBOR	M2
1	51.21216	0.721418	0.458241	2.801906	96.01844
2	69.23215	0.845764	0.476807	2.507966	96.16946
3	84.79028	0.600520	0.327138	2.891756	96.18059
4	92.66481	0.653828	0.288819	3.523838	95.53351
5	108.7157	0.475157	0.862768	5.211798	93.45028
6	119.2233	0.587444	0.923105	9.398482	89.09097
7	128.9389	0.508678	1.036612	11.22530	87.22941
8	134.2632	0.722114	0.956035	10.38108	87.94077
9	140.9915	0.694099	1.035096	9.603876	88.66693
10	145.8078	0.764681	0.994917	9.288452	88.95195

## Variance Decomposition of KIBOR in Islamic Banking System

Period	S.E.	ICRE	IDEP	KIBOR	M2
1	0.654546	7.560191	0.029402	92.41041	0.000000
2	1.013853	5.094655	1.425944	86.12770	7.351702
3	1.278731	4.469779	0.901888	82.55896	12.06938
4	1.371932	3.967019	1.313389	78.11248	16.60711
5	1.448074	3.560867	3.194017	72.97003	20.27509
6	1.495763	4.051031	4.130124	68.56078	23.25807
7	1.527857	5.379226	4.500376	65.97395	24.14645
8	1.552883	6.155437	4.458465	65.47277	23.91333
9	1.558740	6.217064	4.523198	65.50281	23.75693
10	1.566991	6.231241	5.322857	64.93273	23.51318

## Variance Decomposition of M2 in Islamic Banking System

Period	S.E.	ICRE	IDEP	KIBOR	M2
1	51.13868	0.114812	0.902479	4.618898	94.36381
2	69.05126	0.447297	1.842038	3.590095	94.12057
3	76.41843	2.353481	1.984597	3.276814	92.38511
4	79.02824	2.594562	2.747633	3.261936	91.39587
5	83.89745	2.586796	2.776597	3.363717	91.27289
6	89.90675	2.277533	5.841260	5.304710	86.57650
7	92.80092	2.191692	5.965769	5.893165	85.94937
8	99.35621	2.497866	12.00028	5.999309	79.50254
9	107.8594	4.485632	13.76184	6.884701	74.86783
10	115.3816	5.969677	16.26376	7.028722	70.73784