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IMPACT OF MONETARY POLICY SHOCKS ON THE CONVENTIONAL AND ISLAMIC BANKS IN A DUAL BANKING SYSTEM: EVIDENCE FROM MALAYSIA

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This study analyzes the impact of monetary policy shocks on the conventional and Islamic banks in a dual banking system environment. The responses of the conventional banks to monetary policy shocks is expected to be different from that of the Islamic banks due to the nature of the Islamic ones which only involve with interest-free instruments. Focusing on the Malaysian data covering the period from January 1999 to December 2006, the study aims at determining the sensitivity of the Islamic banks by analyzing the impact of interest rate changes on the banks' financing and deposits. To provide meaningful comparison, the same analysis is also conducted on the conventional banks so as to determine the unique risks confronting the Islamic banks. The study employs the impulse response functions and variance decomposition analysis based on the Vector Auto-Regression (VAR) methodology. Contrary to the general expectations, the results show that the Islamic banks' balance sheet items are relatively more sensitive to monetary policy changes, while the conventional banks' balance sheet items, particularly the conventional loans are insensitive to interest rate changes. This implies that the impact of monetary policy is more de-stabilizing on the Islamic banks than the conventional banks. The results of this study have important implications for the risk management

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practices of the Islamic banks, particularly in a dual banking system such as in Malaysia.

1. Introduction

Studies supporting the merits of the Islamic monetary system emphasize the relative stability accorded by the interest-free system due to its asset-linked nature as opposed to the interest-based system which is subjected to the interest rate fluctuations. A monetary system which is relying on interest-free assets is proposed to have lesser element of uncertainty, thus is more predictable and has reliable links to monetary policy objectives. Consequently, there is a general belief that the financial intermediaries, in particular the banks, operating within the interest-free system is shielded from the risks associated with interest rate fluctuations and are more stable compared to the conventional banking system (Khan, 1985). It is further suggested that the Islamic financial market is better-abled to weather economic and financial crisis compared to the conventional financial market. In line with this, current research efforts in the area of Islamic monetary policy have been directed mainly towards evaluating the stability of the demand for Islamic monetary instruments and demonstrating their viability and effectiveness for monetary policy purposes.

This study aims to test the validity of the above proposition by providing empirical evidence on this issue. To achieve this objective, this study compares the impact of monetary policy shocks (represented by interest rate changes) on major bank balance sheet items of the Islamic banks vis-à-vis the conventional banks in Malaysia. As mentioned, while most of the existing literature in this area focuses on the implementation of monetary policy through policy instruments that are consistent with the Islamic law or the *shari'ah*, this study offers a new dimension by assessing the impact of monetary policy shocks on the Islamic financial instruments. This would allow for several inferences to be made about the stability and viability of the Islamic financial instruments for monetary policy implementation purposes. Another aspect of novelty of this paper is in terms of its methodology. This study adopts several econometric investigation techniques to arrive at conclusive findings on this issue. In this regard, the study contributes in enriching the empirical literature in the area of monetary policy from the Islamic perspective.

The rest of this paper is organized as follows: the next two sections provide some background information on the development of the Islamic banking industry in Malaysia and highlight studies focusing on the implementation of Islamic banking system in several countries around the world. Section 4 describes the nature of the data and methodology undertaken by this study. Section 5 presents the empirical findings, and lastly, Section 6 concludes.

2. Overview of the Development of Islamic Banking Industry in Malaysia

The Islamic banking industry in Malaysia has undergone a remarkable growth in the last two decades. Since the establishment of Bank Islam Malaysia Berhad, the first full-fledged Islamic bank in the country in 1983 and the introduction of the Islamic banking-window scheme by the conventional banks in 1993, the industry continues to stage an impressive performance. In the period from 1993 to 2006, total assets of the Islamic banks surged from RM2.4 billion to RM73.8 billion, respectively, registering an impressive compounded annual growth rate of 30.2 percent per year over the thirteen-year period. In the same period, total Islamic deposits mobilised by the banking system increased to RM50.5 billion at end-2006 from a mere RM2.2 billion in 1993. Meanwhile, the growth of total financing was also impressive at RM78.5 billion at end-2006 compared to RM1.1 billion in 1993. The encouraging performance of the Islamic banking industry in Malaysia was also enabled by the wide office networks that allow easy access by customers throughout the country. By end-2006, there were ten full-fledged Islamic banks (with another Islamic bank commenced operation in early 2007), having a branch network of 1,167 comprising of Islamic banking branches and counters made available by the full-fledge Islamic banks and the conventional banks which offered the Islamic banking windows scheme.

The encouraging growth of the Islamic banking industry in Malaysia can largely be attributed to the conducive policy environment accorded by the Malaysian central bank – Bank Negara Malaysia (BNM). To further accelerate development of the industry and create positive competitive pressure to take advantage of positive spill-over effects, BNM grants banking licence to full-fledged domestic and foreign Islamic banks, particularly from the Middle-East to operate in the country. By the end of 2006 and early 2007, several full-fledged Islamic banks commence

operations resulting in eleven full-fledge Islamic banks in Malaysia.[†] With the continuous supportive banking policy provided by the BNM, the Islamic banking industry has a bright prospect for stronger growth in the country.

The encouraging growth of the Islamic banking industry in Malaysia's financial landscape, in part, reflects the country's strong commitment to develop a comprehensive Islamic financial system. In working towards this objective, BNM is carefully taking steps to strengthen the foundation and put in place the pre-requisites of the system. In August 2006, BNM launched the Malaysia International Islamic Financial Center initiative to undertake Malaysia's liberalization strategies to a new level with the aim of positioning the country strategically in the area of Islamic Finance. Under this initiative, "…Islamic banking institutions are allowed to undertake a broader array of Islamic financial activities that include commercial banking, consumer banking, investment banking and international currency business" (Bank Negara Malaysia, 2007). In other words, financial institutions in Malaysia are allowed to strategically positioning themselves in order to take advantage of the encouraging growth of the Islamic banking and finance industry.

Despite the wide-ranging efforts to ensure strong growth of the industry, BNM remains vigilant of the need to ensure the stability of the Islamic financial system, particularly in a dual financial environment where the Islamic and conventional financial systems co-exist in the economy. This is well-reflected by the continuous efforts to facilitate the identification, measurement, monitoring, and control the risks, particularly those which are unique to the Islamic banks. Effective risk management framework is central to accelerate Islamic banking growth and maintain the Islamic financial system stability. In line with this, BNM has been instrumental in the establishment of the Islamic Financial Services Board (IFSB), which in 2005, issued the *Guiding Principles of Risk Management for Institutions Offering Only Islamic Financial Services (IIFS)*. The standard provides explanation of various

[†] These are Asian Financial Bank (M) Berhad, Bank Islam Malaysia Berhad, Bank Muamalat Malaysia Berhad, Hong Leong Islamic Banking Berhad, CIMB Islamic Bank Berhad, RHB Islamic Bank Berhad, AmIslamic Bank Berhad, Affin Islamic Bank Berhad, Al-Rajhi Banking and Investment Corporation (Malaysia) Berhad, EONCAP Islamic Bank Berhad, and Kuwait Finance House (Malaysia) Berhad.

risks related to Islamic banks as well as recommends some risk mitigation techniques to deal with each types of risk.

In view of the increasing role played by the Islamic banks in the intermediation process in the country, it is therefore timely to conduct a deeper analysis on the stability of the Islamic banking institutions in the Malaysian context. The results of this study will shed some lights on the degree of vulnerability of the Islamic banks to monetary policy shocks which is shown by the changes in the policy interest rate. Consequently, the study also analyzes the exposure of the Islamic banks to interest rate changes, thus has important implications for the risk management practices of the Islamic banks, particularly in the context of a dual banking system.

3. Literature Review

Empirical assessments on the merits of an interest-free banking system have been initiated by Darrat (1988) who showed that the banking system in Tunisia becomes more stable without interest-bearing assets than if these assets were to exist. More recent studies such as Kia (2001) and Darrat (2002) provide further empirical evidences on the advantages of the interest-free monetary and banking system by focusing on the case of Iran which has a long history in implementing a full-fledged interest-free monetary and banking system since 1984. These studies find that both the short- and long-run interest-free money demand functions are stable and their coefficients are invariant with respect to policy and other exogenous shocks. Kia and Darrat (2003) compare the demand equations for money and profit-sharing deposits and find that the demand for profit-sharing deposits possesses the most stable and policy invariant function, suggesting that a banking system which is based on profit sharing could help to insulate the monetary system from interest rate fluctuations and minimizes the possibility of financial instability. Consequently, it is further suggested that the profit-sharing deposits could represent a credible instrument for monetary policy-making in Iran.

Samad (1999), Kaleem (2000), and Samad and Hassan (2000) are among the many studies which provide empirical supports on the stability of the Islamic monetary instruments in a dual banking system in Malaysia. For instance, Kaleem (2000) analyzes the Malaysian data over

the period from January 1994 to December 1999 and finds that Islamic banking system is more crises-proof due to its asset-linked nature. In view of this, the interest-free monetary instruments are proposed to be valid and effective instruments that are useful, if not, better than the interest-based monetary instruments, for monetary policy implementation purposes.

Despite the numerous studies supporting the superiority of the interest-free banking system over the interest-based system, further research on more detailed aspects of the relationships between the interest-free banking and various aspects of financial risks reveal some concerns. Baldwin (2002) finds that there is a general lack of awareness in adopting the best risk management practices in the Islamic banking institutions due to an erroneous belief that an Islamic bank, by virtue of its interest-free nature, is not subjected to the interest rate fluctuations. Rosly (1999) finds that Islamic banks in Malaysia are at disadvantage compared to the conventional banks when there is an increase in market interest rates. While the conventional banks could reap higher profit due to the increase in interest rates, Islamic banks face negative funds gap since interest-free financing is based on fixed rate, while liabilities (deposits) are benchmarked against the prevailing interest rates. An examination of the impacts of the conventional money market rates on the Islamic financial instruments in Malaysia by Kaleem and Isa (2006) reveals another weakness of the interest-free monetary system particularly in a dual banking system such as that in Malaysia. The study finds that the current financial market set up is not in favour of the interest-free banking system because it enables the conventional banks to take advantage of the arbitrage opportunities provided by the dual banking system. The conventional banks have the flexibility of investing in both the interest-free and the interest-based financial markets, thus making profit from the interest rate differentials between the two markets. On the other hand, the Islamic banks are only limited to raise financing in the Islamic money market.

In line with this, How et al. (2005) examine whether interest-free banking institutions in Malaysia is subject to the three types of bank risks, namely, credit risk, interest-rate risk and liquidity risk. The study finds that while the commercial banks with interest-free financing have significantly lower credit and liquidity risks, they have significantly higher interest-rate risk than the banks without Islamic financing.

4. Data and Methodology

4.1 Data

The monetary policy variable is depicted by the interest rate, namely the overnight policy rate, henceforth denoted as ONR. The selection of the ONR to represent monetary policy variable in the Malaysian case is due to the fact that currently, the ONR is the monetary policy rate adopted by the BNM.[‡] Meanwhile, the objective variables comprised of the bank balance sheet items of the Islamic banks and conventional banks, namely, Islamic bank financing (IL) and deposits (ID), and conventional bank loans (CL) and deposits (CD). Other objective variables are the consumer price index (CPI) and industrial production index (IPI). Given that Malaysia is highly open economy, the exchange rate variable is also included as a control variable. For this purpose, the real exchange rate (RER) is included in the model. All series are in real term (adjusted by the price index with 2000 as the base year) and in logs, except for the ONR.

The study uses monthly data covering the period from January 1999 to December 2006. All data are sourced from Bank Negara Malaysia's *Monthly Statistical Bulletin*, except for the RER which is gathered from *International Financial Statistics* published by International Monetary Fund.

4.2 Methodology

Based on the VAR methodology, the study adopts the impulse response functions and variance decomposition analysis techniques to empirically explore the impact of monetary policy shocks, shown by the changes in the policy interest rates on the deposits and loans (financing) of the conventional and Islamic banks in Malaysia. Ideally, for the purpose of this study, we need to incorporate all the variables in the modelling, but the model can be poorly estimated in a finite sample, as the addition of a variable will quickly exhaust the degree of freedom. Thus, we estimate a series of separate models including the policy variable (ONR), macroeconomic variables (IPI, CPI and RER) and individual bank

[‡] BNM adopts the overnight policy rate as the monetary policy indicator starting April 2004. Prior to this, the base lending rate was used as the monetary policy indicator.

balance sheet items (CL, CD, IL and ID), resulting in each of the model contains only five variables. Specifically, we focus on the following basic empirical models:

$$x_1 = \{ONR, IPI, CPI, RER, CD\} \quad (1)$$
$$x_2 = \{ONR, IPI, CPI, RER, ID\} \quad (2)$$
$$x_3 = \{ONR, IPI, CPI, RER, CL\} \quad (3)$$
$$x_4 = \{ONR, IPI, CPI, RER, IL\} \quad (4)$$

where ONR is the overnight policy rate, IPI is Industrial production index, CPI is consumer price index, RER is real exchange rate, CD and CL are the conventional banks' deposit and loan, respectively, and ID and IL are Islamic banks' deposit and financing, respectively.

Lag length for all the models is selected based on the Akaike Information Criteria. As in any empirical investigations using time series data, we undertake the normal data pre-testing procedures, namely the unit root and cointegration tests to determine the time series properties of the data series. In general, the results of the unit root test indicate that the variables achieved stationarity after first differencing, while the cointegration test indicate the existence of a long run equilibrium relationship between the variables and the monetary policy indicator.[§]

Impulse Response Functions

We estimate VAR models and generate impulse response functions (IRFs) to study the impacts of interest rate shocks on the four systems containing the bank balance sheet items of the conventional and Islamic banks. An IRF measures the time profile of the effect of shocks at a given point in time on the (expected) future values of variables in a dynamical system (Pesaran and Shin, 1998). The approach is well-suited because not only that it allows for the relative strength of various shocks to be quantified in terms of their contributions to variations in a particular variable of interest, but it also enables the pattern and direction of the transmission of shocks to be traced.

[§] Due to space limitation, the details of the unit root and cointegration tests are excluded in this study. However, the results of these tests are available upon request from the authors.

Variance Decomposition Analysis

Further insights about the relationships among the variables can be obtained through the variance decomposition analysis (VDA). VDA which is termed as an out-of-sample causality tests, provides an indication of the dynamic properties of the system by partitioning the variance of forecast error of a certain variable into proportions attributable to innovations (or shocks) in each variable in the system including its own. In other words, the VDA provides a literal breakdown of the change in the value of the variable in a given period arising from changes in the same variable in addition to others in previous periods. According to Sims (1986), a variable optimally forecast from its own lagged values will have all its forecast error variance accounted for by its own disturbances. It is generally observed that in applied research, it is typical for a variance to explain almost all its forecast error variance at short horizons and smaller proportions at longer horizons.

5. Results and Discussions

5.1 Impulse Response Functions

The IRFs allow for the analysis of the impacts of interest rate shocks on the bank balance sheet items of both banking groups. The IRF shows the magnitude and timing of the responses of the objective variables (the bank balance sheet items) to a shock in the interest rate variable. This enables a comparison of the extent of responses of the bank balance sheet items of the two banking groups to the policy shocks.

In this study, the IRF analysis is being applied on two alternative orderings of the system. These are: i) CL/CD/IL/ID, ONR, IPI, CPI and REER, and ii) CL/CD/IL/ID, ONR, CPI, IPI and REER. Since the results for the two orderings are qualitatively similar, we present responses of the functions for the first ordering. Figure 1 shows the responses of the endogenous deposits and loans of both conventional and Islamic banks to two standard deviation shocks to interest rate. In all cases, the IRFs are reported over the 36 months horizon to allow for the impact of monetary policy to filter through the economy. To provide some idea of uncertainty surrounding the estimated response, based on Sim and Zha (1995), one standard deviation of confidence bands have

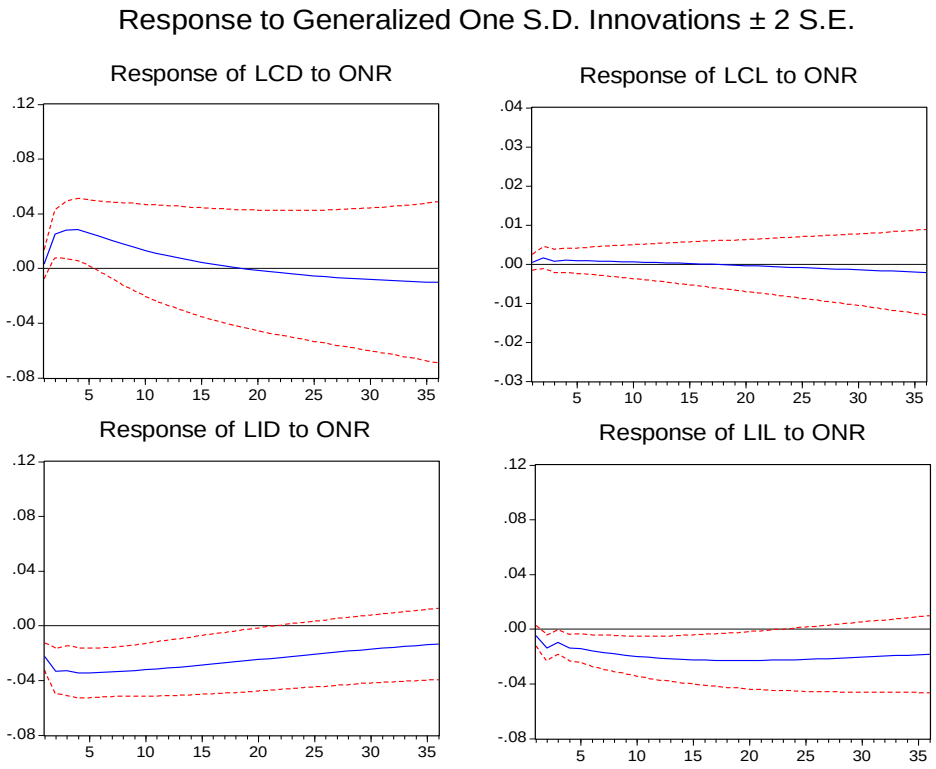
been obtained by Monte Carlo integration methods with 1,000 replications. Only the responses of both conventional and Islamic loan (financing) and deposit to innovations in interest rate were highlighted, as they are more relevant to our present study.

As observed in Figure 1, there is a significant positive relationship between interest rate and the conventional deposit. This augurs well with the finance theory which states that an increase in the policy interest rate leads to higher deposits as depositors expect a higher return for their deposits in the conventional banks. Moreover, conventional deposit seems to respond instantaneously to changes in the ONR until the period of 8-9 months before tapering off gradually. On a contrary, it is interesting to note that the response of the Islamic deposits is significant and negative to interest rate changes. In particular, the innovations in ONR lead to an instant significant negative response of the Islamic banks' deposits for a period of about two years. This finding lends support to the studies of Haron and Norafifah (2000) and Sukmana and Yusof (2005) which reaffirm the view that interest rate is negatively related to the amount deposited in the Islamic banks. In other words, an increase in the interest rate would reduce the amount deposited in Islamic banks. A plausible explanation for the negative relationship between interest rate and Islamic deposit is that customers transfer the funds from the Islamic banks to the conventional banks which offer higher return to their deposits as the interest rate increases. This study also supports the finding by Gerrard and Cunningham (1997) in Singapore where non-Muslims withdrew their funds when interest rate is higher in the conventional banks than the rate of return in Islamic banks. Nevertheless, this has not always been the case. In several other countries, customers continue to retain their deposits in the Islamic banks despite the increase in the interest rate environment. For instance, in the case of Kuwait, there were no significant massive withdrawals of funds from the Islamic banks as a result of an increase in the interest rate (Haron and Norafifah, 2000). Similarly, in Sudan, depositors continue to maintain their funds in the Islamic banks despite not being rewarded accordingly by the Islamic banks.

For loans, the IRF results suggest that there seems to be an insignificant negative relationship between interest rate variable and the loans of the conventional banks. However, there is a significant negative relationship between the ONR and the Islamic financing (IL) for a period of at least

13-14 months. A possible explanation for this relationship is that the demand for Islamic loans is lower during times of high interest rates as consumers do not want to lock-in their loan commitment at high interest rates. This finding is consistent with the views of Rosly (1999) which affirms that Islamic banks in Malaysia is at disadvantage as compared to their conventional counterparts when there is an increase in the interest rates. As mentioned earlier, the Islamic banks face negative funds gap since it is based on fixed return while their deposits are benchmarked against the prevailing interest rates. How et al. (2005) also provide empirical evidence that commercial banks with interest-free financing are more susceptible to higher interest rate risk than the banks without Islamic financing.

Figure 1: Impulse Responses of the Deposits and Loans to Monetary Policy Shocks



5.2 Variance Decomposition Analysis

The VDA is used to assess the dynamic interactions between the monetary policy indicator and the bank balance sheet items of both banking groups. By comparing the two banking groups, this analysis would reveal the contribution of interest rate in explaining the forecast error variance of the balance sheet items of the Islamic banks as opposed to the conventional banks.

The results of the VDA are shown in Tables 1 and 2. In general, the results further substantiate the earlier findings which are based on the IRFs. In the case of Islamic deposits, variations in interest rate variable explain around 10 percent of its forecast error variances at the 24-month horizon, indicating that interest rate or the ONR is one of the most

important variables in explaining the fluctuations in Islamic deposits. The VDA result also shows that variations in ONR contributes up to 24 percent of the forecast error-variance of Islamic financing, compared to that of the conventional loans where variations in ONR contributes only around 3 percent of its forecast error-variance. This finding is inconsistent with the earlier findings by Darrat (1988), Darrat (2002), Kia (2001), Kia and Darrat (2003), and Kaleem (2000) which propose that the interest-free banking system is invariant to interest rate shocks. The findings of this study somewhat contradict their suggestions that the interest-free banking system is able to insulate monetary system from interest rate fluctuations and therefore, minimize the possibility of financial instability. Our finding on the other hand, seems to echo those of Kaleem and Isa (2006) and Rosly (1996) which state that the weakness of the interest free monetary system particularly in a dual banking system such as in Malaysia lies in the current financial market setup. The dual banking system provides the arbitrage opportunities for the conventional banks which are more flexible to participate in both the Islamic and conventional financial markets. The Islamic banks, on the other hand, are limited to raise financing only in the Islamic money market.

Table 1: Variance Decompositions of Deposits

Period (Month)	Percentage of forecast variance explained by innovations in:									
	Variance Decompositions of Islamic Deposits					Variance Decompositions of Conventional Deposits				
	LID	ONR	LIPI	LCPI	LREER	LCD	ONR	LIPI	LCPI	LREER
1	100.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00
4	97.95	1.46	0.07	0.19	0.32	84.77	3.86	0.20	2.91	8.26
8	93.62	3.90	0.44	1.10	0.93	69.21	6.62	0.38	6.38	17.41
12	88.40	6.50	1.21	2.85	1.03	59.30	8.99	1.27	9.06	21.37
18	81.09	9.06	2.32	6.57	0.96	50.33	11.17	2.83	12.39	23.28
24	75.45	9.69	2.77	10.81	1.28	45.12	12.01	3.90	15.31	23.67
30	71.06	9.28	2.71	14.88	2.08	41.90	12.08	4.43	17.94	23.64
36	67.18	8.70	2.55	18.42	3.15	39.82	11.79	4.62	20.28	23.48

Table 2: Variance Decompositions of Loans

Period (Month)	Percentage of forecast variance explained by innovations in:									
	Variance Decompositions of Islamic Financing					Variance Decompositions of Conventional Loans				
	LIL	ONR	LIPI	LCPI	LREER	LCL	ONR	LIPI	LCPI	LREER
1	100.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00
4	93.46	5.51	0.75	0.07	0.20	97.29	0.70	0.66	0.07	1.28
8	88.76	9.64	1.19	0.05	0.35	93.17	1.57	1.73	0.09	3.44
12	83.95	14.49	1.08	0.20	0.28	90.65	2.08	2.37	0.24	4.65
18	76.69	20.52	0.82	0.99	0.97	88.88	2.45	2.80	0.74	5.14
24	69.99	23.62	0.73	2.61	3.05	87.80	2.66	2.97	1.47	5.10
30	64.21	24.10	0.69	4.94	6.06	86.64	2.86	3.06	2.39	5.05
36	59.30	23.06	0.63	7.69	9.33	85.25	3.10	3.12	3.45	5.09

6. Conclusions

This study analyzes the impact of monetary policy shocks on the Islamic banks' financing and deposits and compares it with that of the conventional banks in Malaysia. The study finds conclusive evidence that the impacts of policy shocks are more de-stabilizing on the Islamic banks than the conventional banks. Contrary to the general belief, the results of this study show that the Islamic bank balance sheet items are more sensitive to interest rate changes compared to their conventional counterparts. These results can be attributed to several reasons. The conventional banking industry which has a wide and deep market due to its long existence and global linkages are able to offset the decline in liquidity following the tight monetary policy. On the other hand, the Islamic banking industry has to bear the "brunt" of tight monetary policy since it is still under-developed, thus has limited options for the players. In mitigating the consequences of the interest rate shock, Islamic financial institutions, has to expedite on the efforts to develop relevant risk management tools that could address the above concerns. The efforts to further improve the risk management practices among the Islamic banks are even more crucial now in view of the shift in the interest towards Islamic banking and finance in the aftermath of the global economic and financial crisis 2007/2008.

The results also highlight a major shortcoming of the dual financial system currently running parallel in the country. It can be implied that the intention to implement an interest-free monetary system in Malaysia is still premature with the current financial infrastructure setup that the country is currently having. This study offers an important dimension for the policymakers to consider in efforts to develop Malaysia as a global hub for Islamic banking and finance. Due to the unique risks faced by the Islamic banking institutions as identified by the study, it is important to devise relevant risk mitigation techniques so as to enable the Islamic banks to weather monetary policy shock in the current financial infrastructure. It is important to re-iterate that as Iqbal (1999) noted, despite the growing interest in the Islamic banking and finance, the Islamic financial markets are still lacking in terms of risk management tools. Finally, this study highlights the importance of considering the consequences of monetary policy implementation on the Islamic banking institutions as well as the need to develop a comprehensive Islamic financial system in the country.

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