ANALYZING DETERMINANTS OF ASSETS AND LIABILITIES IN ISLAMIC BANKS: EVIDENCE FROM INDONESIA

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Abstract

This study attempts to analyze the factors that are important in determining the Islamic banks' two major balance sheet items, namely deposit and financing in the case of Indonesia. By employing the vector autoregression analysis along with the associate variance decomposition analysis for all Islamic banks in Indonesia, the study examines the importance of selected financial and macroeconomic variables in determining the levels of deposit and financing in the Islamic banks. Using monthly data, the study covers the period from January 2004 to March 2011. The results highlight the influential role of rate of return on the Islamic deposit and deposit rate on the conventional bank in determining the deposit of the Islamic banks. On the asset side, the lending rate of the conventional loan is highly significant in influencing the demand for financing by the Islamic banks. Essentially, this study indicates the profit motive among the Islamic banks customers as reflected by significant effects of the financial variables on deposit and financing of the Islamic banks. The findings provide further support of the exposures of the Islamic banks to the rate of return risk, interest rate risk, and displaced commercial risk. Amid the aggressive efforts by Bank Indonesia to accelerate the growth of the Islamic banking and finance industry in the country especially to enhance the competitiveness of the industry to face the ASEAN market integration in 2015, these findings would enable the policy-makers to focus on critical issues in implementing strategies to achieve the goal of development this industry in Indonesia.

Keywords: rate of return risk, interest risk, displaced commercial risk, m*udharabah* investment deposit, *murabahah* financing.

1. INTRODUCTION

The Islamic banking and finance industry has captured substantial interest in the financial market particularly in the aftermath of the 2007/2008 global financial crisis. Due to its increased presence in the global financial scenario, the Islamic banking and finance industry is no longer seen as peripheral to its conventional counterpart, but currently is playing a complementary role that has high potential to be developed further as a viable alternative to the conventional financial system. Currently, the Islamic finance industry has been growing rapidly worldwide. While it represents a small proportion of the global financial market (estimated at 1%-5% of the global share), the Islamic finance industry is experiencing double-digit growth rates annually in the recent years, estimated at 10%-20% growth per annum. Total assets held globally under Islamic finance reached US$1 trillion in 2010. The Islamic commercial banks accounted for 73 percent of the assets, Islamic funds 14 percent, *sukuk* issues 12 percent, and *takaful* funds 1 percent.[1]

It is widely accepted that the financial sector plays a significant role in supporting economic growth and prosperity of a country. Most of the business sectors today are highly dependent on intermediated funds or bank financing as a source of capital. The surplus units invest their funds in the financial institutions, which are then channelled to the various economic sectors. The ability of the banks in extending financing depends very much on their ability to mobilize the deposits. At the same time, there is an increase competition among the financial institutions in attracting deposits as well as allocating funds to viable business sectors. As such, there is a stiff competition among the banking institutions,

[1] Reuters, "Islamic Finance Set to Cross $ 1 Trillion: Moody's," *The Economic Times*, October 21, 2010.

conventional and Islamic banks alike, in attracting deposits and extending financing to the customers.

Some countries like Iran, Pakistan and Sudan have implemented full-fledged Islamic banking system, while others such as Indonesia, Malaysia, Bahrain, and Kuwait have adopted a dual banking system in which the Islamic financial system coexists with the conventional financial system. In a dual banking system, the Islamic banking system operates in parallel with its conventional counterpart. Even though these are two separate systems, empirical studies have shown that there is an indirect link between the two (see for example Haron and Ahmad, 2000; Kaleem and Isa, 2003; Zainol and Kassim, 2010). In particular, activities of the conventional banks have been shown to give significant impact on the performance of the Islamic banks, vice versa. From the customers' perspective, bank customers are free to choose either system and also given the rights to switch between them. The ability of the Islamic banks to offer competitive return and better services are among the key determinants to attract the banking customers. The studies by Ahmad and Haron (2002), Kader and Leong (2009), and Zainol and Kassim (2010) document that the failure of the Islamic banks to fulfil the customers' expectation might lead to liquidity switching and withdrawal. Besides that, the Islamic banks are exposed to interest rate risks in which changes in the conventional interest rates put pressure on the Islamic deposit rates as interest rate differentials could lead to easy arbitrage opportunity (Zainol and Kassim, 2010). As a consequence, the Islamic banks may be under pressure to pay return that exceeds the rate that has been earned on assets financed. Since most of the Islamic financing instruments are based on fixed rate contracts, the maturity mismatch between liabilities and assets of the Islamic banks could result in liquidity problems when the interest rate is changing. Again, this poses another challenge for the Islamic banks in its liquidity management.

Several studies have shown that the Islamic banks customers are motivated by return (see, for example, Haron and Ahmad, 2000; Kasri and Kassim, 2009; and Zainol and Kassim, 2010), thus, it is therefore important for the Islamic bank management to recognize the extent that the rates of return on deposits influence

their customers' decision to save/invest. Empirically, it has been shown that the depositors will increase their deposits only when the rate of return increases. Otherwise, when the rate of return decreases, there will be a deposit flight from the Islamic banks to the conventional banks.

The Islamic banks are exposed to interest rate risk or rate of return risks. It is resulted from a unique structure of the Islamic banks in that their liabilities as floating rate of return, but the assets in fixed-return assets (*murabahah* or BBA). An increase in the benchmark rates may result in depositors having expectations of higher rate of return. However, the Islamic banks cannot increase the rate of return on their deposits because the assets are mainly fixed return assets. Unlike conventional banks that have more flexibility on the asset side, the Islamic banks have the fixed-rate assets that not sensitive to the changes in market interest rate, while the liabilities are sensitive to interest rate changes. Therefore the Islamic banks cannot react swiftly to changing interest rate and this lead to higher exposure to rate of return risk. As a consequence of rate of return risk in the Islamic banks is the displaced commercial risk (DCR) which involves the transfer of risk associated with deposits to equity holders. The Islamic banks may not be able to pay competitive rate of return compared to its peer and other competitors. Depositors will have the incentive to seek withdrawal and to prevent the withdrawal; the Islamic banks will need to apportion part of their share of profits to the depositors.

Besides financial rewards, there are also macroeconomic variables identified in the existing literature as potential determinants of Islamic banking deposits and financings. Kasri and Kassim (2009) and Haron and Azmi (2005) find that the Islamic banks are sensitive to macroeconomic changes. In particular, economic growth, stock market and inflation are found to have significant long-run relationship with the deposits placed with the Islamic banks.

From the theoretical perspective, Islamic banking is different from the conventional banking. The Islamic banks are bounded to some basic principles outlined in the *Holy Quran*. The Islamic banking transactions must be free from interest (*riba*), and contractual uncertainty (*gharar* and *maysir*), adherence to risk-

and profit-sharing, promoting of *halal* investment that enhances society and must be asset-based. Since the Islamic banks operate as a financial intermediary, it means that the Islamic banks collect funds from investors both by means of *mudharabah* investment and deposit accounts, on the liability side of balance sheet, and then invest these funds in a variety Islamically-acceptable forms, on the asset side. According to Al Jarhi (2004), the conventional banking bears similarities with Islamic banking when the relationship between savers and banks are considered. Indeed, the Islamic banks collect funds through two categories of deposits: demand deposits and investment deposits. While demand deposits are perfectly guaranteed and yield no return, investment deposits are similar to mutual fund shares. However, the two banking approaches are distinct relatively to the financing instruments. More precisely, the Islamic banks have developed interest-free financing instruments based on two principles: profit- and loss-sharing (PLS) and mark-up principles, while the conventional banks apply interest-based loans.

The Islamic principles are expected to not only affect on the decision making process of the Muslims, but also on their perceptions towards the Islamic banks. Several studies have been conducted in the area of banking patronage that incorporates the religious aspects in determining the factors that influenced the public to deposit their funds. The studies conducted by Haron and Ahmad (2010), Haron and Azmi (2005), and Zainol and Kassim (2010) consider that religious dimension is an important element to attract more people to deposit their funds in the Islamic system. Religion is a main determinant of customers' choice of Islamic bank in Bahrain.[2] However, contradictory evidence was founded from the study conducted in Sudan and Turkey where religion is not the main reason for customer in selecting Islamic bank (Erol and El-Bdor, 1989). Similarly, the study conducted in Indonesia finds that the Islamic depositors are also profit-oriented as the Islamic banks' depositors transfer their funds to conventional banks when the rate of return provided by the Islamic banks is significantly lower than interest rate of its counterpart (Kasri and Kassim, 2009). Meanwhile, both religion and

[2] Metawa and Almossawi. Banking Behavior of Islamic Bank Customers: Perspectives and Implications. *International Journal of Bank Marketing,* 16(7), 1997, pp. 308.

profits are equally important for customers in Malaysia and Singapore to maintain their relationship with the Islamic banks (Ahmad, Harun and Planisek, 1994).

Similarly, on the financing side, Kader and Leong (2009) in their study on Islamic bank financing in Malaysia, find that the Islamic bank customers are also profit-motivated and their decisions to obtain *Bai' Bithamin Ajil* (BBA) financing are be influenced by the substitution effect based on the movement of the interest rate. During rising interest rates, BBA financing is relatively more popular, while during falling interest rates customers would prefer conventional loans rather than Islamic financing.

Rosly (1999) provides the theoretical explanation of the impact of interest rate changes on Islamic performance in the dual banking system. He emphasized that Islamic banks are exposed to interest rate risks and the root cause of this phenomenon is the overdependence of the Islamic banks on BBA financing where the profit rate (financing rate) is fixed. When interest rate is rising, the base lending rate (BLR) and rate of return on deposits of the conventional banks would change accordingly to changes in the market interest rate. As a result, the profit margin of the conventional banks will not be affected. However, the Islamic banks cannot increase the rate of return on its deposit because the BBA profit margin is fixed. As a consequence, Islamic deposit gives lower returns. The substitution effect comes into play where depositors prefer the conventional banks. In the case of falling market rates, the conventional bank is able to adjust both the deposit and base lending rates downwards hence maintaining its profit margin. Islamic bank would also reduce the rates of return on deposits in line with the conventional deposit rates. Since the profit rate of BBA financing is fixed, it is rational for the Islamic bank to lower the deposit rates hence widening its profit margin. In the case of Islamic financing, because existing BBA profit rates remain fixed, customers would find that existing BBA financing is relatively more costly than existing conventional loans (Kader and Leong, 2009). This is the structural weakness of the fixed BBA mechanism.

Based on this background, this study attempts to analyse the factors determining deposit and financing in the Islamic banks in Indonesia. It is indeed

very important to understand these determinants in order to strengthen the survival of the Islamic banks in the increasingly competitive industry. This understanding also becomes an input for risk management for the Islamic banks in a dual banking system. Some studies have been conducted and only concentrated on the factors affecting the level of saving in the Islamic bank, while for factors determining Islamic bank financing, research is still meagre. Among the existing studies in this area, none have investigated factors affecting deposit and financing behaviour of the Islamic banks' customers simultaneously but rather, conducting the study separately and independently. Thus, this study attempts to fill the gap in the literature by investigating the relationship between Islamic bank deposits and financing and their determinants. The main purpose of this study is to quantify the link between the levels of deposit and financing of the Islamic banks and its measurable determinants such as rate of return, interest rate, gross domestic product, inflation, stock market and number of Islamic banks.

The study attempts to investigate the determining factors affecting Islamic bank deposits and financing with the following specific objectives:

- To examine the effects of selected economic variables such as rate of return, interest rate, gross domestic product, stock market, inflation and the number of Islamic banks' branches on the level of deposit and financing of the Islamic banks;
- To identify the effects of interest rate changes on the deposit and financing of the Islamic banks;
- To assess customers' motivation (religious motive or profit motive) in their banking selection process; and,
- To investigate the existence of displaced commercial risk between Islamic banks and the conventional banks.

The remainder of this paper is organized as follows: Section 2 provides an overview of the history and development of the Islamic bank industry in Indonesia. Reviews of the relevant literature are presented in section 3, while methodology and data used are described in section 4. Section 5 discusses the empirical results and, finally, section 6 concludes.

2. FACTORS AFFECTING SAVING AND FINANCING: A LITERATURE REVIEW

Commercial banks, both conventional and Islamic, are dependent on the depositors' money as a source of funds. Identifying determinants of depositors' behaviour in the commercial banks are generally derived from the saving theory framework. Literature on the determinants of private saving behaviour can be traced back to the early 1930s, when Keynes (1936) proposed the Absolute Income Hypothesis which states that saving is the excess of income over consumption expenditure, or simply, saving is as a function of income. Extending the Keynesian perspective, Modigliani and Brumberg (1954) proposed the life-cycle model which emphasizes that the main motive of saving is the accumulation for retirement.

According to the Keynesian theory, saving is the excess of income over consumption expenditure, or simply, saving is as a function of income. The Keynesian theory assumed that there are three main motives why people hold money, namely for transaction, precautionary and investment purposes. In order to cater for these motives, commercial banks offer three categories of deposit facilities which are demand, saving and time deposits.[3] Demand deposit facility is commonly referred to as the current account and is designed for those who need money for the transaction purposes. The second category of deposit is the saving account, which caters for the need of those who wishes to save money but at the same time want to earn an income. The last category of deposit facility is time (fixed) deposits, which is offered by banks to cater for the investment motives of customers who normally have idle money and are looking for better return.

The choice to save can be regarded basically as a consequence of intertemporal utility maximization by rational agents, as saving is another name for consumption postponed. This insight constitutes the essence of the "life-cycle approach" which is the model most frequently referred in the studies of saving

[3] Haron and Azmi, loc.cit.

and consumption.[4] The fundamental assumption of the life-cycle hypothesis is that an individual seeks to maximize the present value of lifetime utility to the budget constraint. The theory predicts that consumption in a particular time period depends on the expectations about lifetime income. According to this theory, the lifetime of an individual is divided into a working period and a retirement period. Therefore, since income tends to fluctuate systematically over the course of a person's life, saving behaviour is determined by one's stage in the life-cycle where they become net "savers" during their working period and "dissavers" during the retirement period.

Saving, according to the classical economics is also a function of interest rate (see, for example, Chen, 2002; Cohn and Kolluri, 2003; Arthukorala and Sen, 2004). Rate of interest has always been featured as one of the important considerations in explaining the saving behaviour of individuals. The higher the rate of interest, the more money will be saved since at higher interest rates people will be more willing to forgo present consumption. Touny (2008) explains that the net effect of the real interest rate on saving can be decomposed into two effects: substitution effect implies that a higher interest rate increases the current price of consumption relative to the future price, and thus affecting saving positively. The other effect, which is called the income effect, indicated that if the household is a net lender, an increase in the interest rate will increase lifetime income, and so increase consumption and reduce saving. Therefore, it is expected that interest rate will have a positive impact on saving only when the substitution effect dominates the income effect.

Thus, there is considerable agreement in standard economic theory that the saving and investment decision are primarily guided by the interest rate. The demand for loanable funs (or investment demand) is shown to be negatively related to interest rate while supply of loanable funds (or supply of saving) is positively related.

[4] Guariglia, A. Saving behaviour and earnings uncertainty: Evidence from the British Household Panel Survey. *Journal of Population Economics*, 14, 2001, pp. 600.

In contrast to the neoclassical assumption of economic behaviour, the economic behaviours of Muslims are bounded by three general principles namely belief in the Day of Judgment and life in the hereafter, Islamic concept of riches and Islamic concept of success.[5] All these principles are expected not only to have a significant impact on the decision making process of the Muslims, but also their perceptions towards Islamic banks. The Islamic banks which operate under the *shariah* principles are expected not to have the same philosophies and objectives as adopted by the conventional banks. They should be in line with the Islamic teachings.

Belief in the Day of Judgment or hereafter implies that the choice of action is based not only on the immediate financial returns but also on those returns in hereafter. Life before death and life after death are closely interrelated in a sequential manner. This has two affects: first, the outcome of choice of action is composed of two parts, its immediate effect in this life; and its later affect, in the life to come. Second, the number of alternative uses of one's income is increased by the inclusion of all the benefits that would be gained only in the hereafter. Therefore, the decision to place deposits in Islamic banks not only due to profit motives but rather to gain the blessings of Allah and one the ways to achieve this is for Muslims to support any program that serve to improve the prosperity of the Muslim communities.

According to the second principle that involves wealth, Islam has given a clear guideline that should be followed by Muslims. In Islam, wealth is a bounty from Allah and as an instrument that might be used for good or evil. Poverty is, in some instance, associated with disbelief and riches are considered a gift from Allah.[6] Wealth itself is considered as an important means by which man can pave the way for the attainment of his ultimate objective. All persons are exhorted to work to earn a living and accumulate wealth. Accumulating wealth is considered among the highest blessing bestowed on man and everyone is encourage to strive for wealth.

[5] Dr. Monzer Kahf. *A Contribution to the Theory of Consumer Behaviour in Islamic Society*. Studies in Islamic Economics, Leicester: The Islamic Foundation (1980) pp. 22.
[6] Ibid., pp. 22.

The Islamic concept of success also serves as an important factor influencing Muslim behaviour towards Islamic banks. Islam defines success as the level of obedience to Allah and not to the accumulation of wealth. Service and obedience may be rendered by the positive use of capabilities and resources given by Allah. Since every Muslim believes that all properties belong to Allah, returns on their deposits are considered as gift from Allah irrespective amount. Similarly, in the case of losses, it is all from Allah.

Jalaluddin (1992) argues that in contrast to the Keynes' absolute income hypothesis, saving is not merely a "residual" concept, in the sense that what is left over from consumption is treated as saving where no ethical values and social responsibilities attached. A Muslim saves to perform his duties to himself, family, society and Almighty Allah which definitely require economic backing. Therefore, there is a social welfare dimension to the saving behaviour of a Muslim. Furthermore, he argued that the life-cycle hypothesis proposed by Modigliani and Brumberg (1954) is more applicable for the framework of Muslim saving behaviour. Four motives of saving proposed in the life-cycle model namely to increase the estate of one's heirs, to adjust income to irregular consumption, to meet possible emergencies and to accumulate assets are not contradictory with Islamic norm behaviour. Many *Qur'anic* verses and *hadiths* suggest the similar motives[7]. This clearly shows that saving is important to meet the future emergency needs, not only for individual but also for family.

In terms of banking operation, in an Islamic financial system a fixed return on saving or a fixed cost of borrowing for investment will not be allowed. On the other hand, banks will provide funds for investment without charging a fixed cost of capital. However, these funds will participate in the profit/loss of the investment, and in turn such profit/loss will be shared with the depositors. Thus, Islamic banking exists to eliminate the practice of interest (*riba*) in financial sector and to promote the profit- and loss-sharing mechanism.

[7] Al Qur'an 17: 29 and a Hadiths from al-Bukhari mentioned that *"Narrated by Umar: the holy prophet (pbuh) used to sell the dates of the gardens of Bani Nadir and store for his family so much as would cover their needs for a whole year"*, al-Asqalany, 2003

Capital should be treated as a tool or instrument of enterprise. There is no dichotomy between enterprise and capital. They jointly become one factor of production. After merging capital as a part of enterprise and establishing profit as the only form of reward for the joint factors of production, the basis of the banking has also to be revised. Banks being the mobilisers of the savings or capital funds can serve as an intermediary link between the savers or the suppliers of the capital and the actual users of the funds or the entrepreneur. In the Islamic framework, interest-free banking can be run on the basis of profit- and loss-sharing (PLS) arrangement, between the suppliers of the capital and the users of the capital. There will be a two-tier arrangement of PLS between the entrepreneurs or the ultimate users of the investible fund and the banks and at the same time there will be a PLS arrangement between the banks and the depositors who are savers or suppliers of the funds.

Transformation of banking from an interest-based system to one that relies on profit-and loss-sharing makes an Islamic banking system essentially an equity-based system. In such a system, depositors are treated as if they were the shareholders of the bank, and consequently are not guarantee a nominal value, or a predetermined rate of return, on their deposits. If the bank makes a profit, the shareholder (depositor) is entitled to receive a certain share of it. On the other hand, if the bank incurs a loss, the depositor is expected to share in it and thus receive a negative rate of return.[8]

The main source of funds for Islamic banks would be two forms of deposits – transaction deposits and investment deposits. Transaction deposits are directly related to transactions and payments, and can be regarded as equivalent to demand deposits in a conventional banking system. Banks would guarantee the nominal values of the deposits, but no return on this type of liability. Investment deposits more closely resemble shares in a firm, rather than time and saving deposits of customary sort. The bank offering investment deposits would provide no guarantee on their nominal value, and would not pay a fixed rate of return.

[8] Mohsin S. Khan and Abbas Mirakhor, *The Framework and Practice of Islamic Banking*, the Institute for Research and Islamic Studies, 1987, pp. 5.

Depositors, instead, would be treated as if they were shareholders and therefore entitled to a share of the profits and losses made by the bank. The profit-or loss-sharing ratio has to be agreed in advance of the transaction between the bank and the depositors.[9]

Similar to the empirical studies on the conventional banks, most studies on the determinants of saving in Islamic banks are also investigated through the saving theory framework. Earlier studies generally focus on the discussion of normative aspects of saving behaviour in the Islamic framework. The studies than have been extended to include specific factors that could influence public when deciding to deposit in Islamic banks. Kasri (2009) classifies factors that could influence the Islamic banking growth in two perspectives; micro and macro perspectives. From a micro-perspective, several studies have focused on surveying qualitative aspects of banking selection criteria which directly relate to the customer preference towards the Islamic banks. Among studies that have been conducted relating to this perspective are and Erol and El-Bdour (2007), Haron et al. (1994), Gerrald and Cunningham (1997), Metawa and Almossawi (1998), Nasser et al. (1999), Ahmad and Haron (2002), Bank Indonesia (2005), Dusuki and and Abdullah (2007).

On the other hand, at the macro-level, quantitative models have been developed to investigate the factors that influence the level of deposit mobilized by the Islamic banks, hence provide insights into the determinants of saving in Islamic banks. This macro-empirical approach fills the weakness of the micro-approach which based on the survey on banking selection criteria. Among the empirical studies on the determinants of saving in Islamic banks are Haron and Shanmugan (1995), Haron and Ahmad (2000), Haron and Azmi (2005), Mangkuto (2004), Rohmah (2006), Kasri and Kassim (2009), and Kasri (2009).

One of the earliest, Erol and El-Bdour (1989), on Islamic banking discover that the most important criteria considered by the customers are provision of fast and efficient services, bank's reputation and image, and confidentially. Interestingly, they also document that religious motivation is not a primary criteria

[9] Ibid., pp. 5.

for the selection of Islamic banking services in Jordan. This finding is contradicted by later researchers like Metawa and Almossawi (1998) and Naser et al. (1999) who assert that adherence to Islamic tenets is the main consideration for customers to patronise the Islamic banks in Bahrain and Jordan respectively. Nevertheless, these authors also affirm that other factors namely Bank's reputation, confidentially, friends and family influence and provision of quality services are equally important for customers when making decision on their banking selection. These findings somehow confirm earlier studies, which found that both religious and economic factors are equally important for customers in selecting Islamic banks (Haron et al., 1994; Gerrard and Cunningham, 1997; Ahmad and Haron, 2002).

Interestingly, Gerrad and Cunningham (1997) find that in Singapore, the behaviour is relatively different due to customers' segregation into Muslim and non-Muslim group. The Muslim customers considers religious and quality services as major reasons for choosing Islamic banks, while the non-Muslim customers place high importance for getting more interest payment from the banks in making their decision and choosing an Islamic bank's services. In addition, recent study by Dusuki and Abdullah (2007) pint out that responsibility practices, location and convenience, and product prices are also important in patronizing the Islamic banks in Malaysia. Furthermore, in Indonesia, study on potency, preference and people's behaviour towards Islamic bank conducted by Bank Indonesia (2005) finds that the main reason for banking customer choosing Islamic banking services are religious motive and the availability of Islamic banking networks. The study also reveals that return of Islamic banks is not a significant reason in patronizing the Islamic banks in the country. However, the perception on interest rate is rather ambiguous. Although most of the respondents agree that interest rate is prohibited in Islam, they are not against the practise of interest rate in the banking system.

Despite their strengths in explaining customer preference towards Islamic banks, the survey on banking selection criteria through micro-perspective have some limitation. The main weakness is that the results tend to be restrictive

towards the chosen samples or location.[10] The empirical studies on determinants of saving in Islamic banks from macro-perspective are to cover this weakness. Haron and Azmi (2005) investigate the impact of selected economic variables on deposits level in Islamic and conventional banks in Malaysia. By applying econometric techniques, the study finds that economic variables such as Base Lending Rate (BLR), stock market, inflation, money supply and income have significant long-run relationship with deposits placed by customers in Islamic and conventional banks. The direction and strength of relationship, however, are different those two. In the case of deposits of Islamic system, with the exception of BLR, other economic variables have a significant relationship with the saving function.

Mangkuto (2004) examines the effect of *mudharabah* deposit yield in the bank and interest rate in the conventional bank on level of the Islamic deposits. Positive correlation between level of the deposit and its yield is found during January 2000 – July 2004 period indicating that higher return leads to higher level of the deposit. In contrast, the conventional interest rate is negatively correlated with the deposit yield, implying the importance of conventional interest rate in influencing the decision to save in Islamic banks. The scope of study than is later widened by Rohmah (2006) and Kasri and Kassim (2009) to cover all Islamic banks in Indonesia.

Rohmah (2006) on her study using Autoregressive Distributive Lag (ARDL) shows that the *mudharabah* investment deposit in the Islamic banks are cointegrated with return of the Islamic deposit, interest rate of the conventional banks' deposit, number of Islamic banks' branches and national income in the long run. Despite using a different methodology, cointegration test and VAR, Kasri and Kassim (2009) present similar results that return to saving is to be most significant factors to save in the Islamic banks in the case of Indonesia since other factors under consideration, which are number of Islamic bank networks and real income, are shown to be insignificant in affecting the level of Islamic deposit in

[10] Kasri, A.R. The Determinants of Islamic Banking Growth in Indonesia. *Journal of Islamic Economics, Banking and Finance*, Vol. 6 No. 2, 2009, pp. 23.

the short run. This is probably because the period of observation is indeed a aggregated study for Islamic banking industry in Indonesia.

In dual banking system, the Islamic banking system operates in parallel with its conventional counterparts. Customers are free to choose system and also given right to switch between them. In this regard, there is a tendency for the customers to take advantage of any arbitrage opportunity due to the rate differentials and funds flows. As a consequence, Islamic banks may expose to the problem of interest risk.[11] When interest rates are rising, the base lending rates and rates of return on deposits of the conventional bank would change accordingly to changes in the market interest rates. As a result, the profit margin of the conventional will not be affected. However, the Islamic banks could not increase the rate of returns on its deposits because most of their financing types are fixed profit margin.

Studies conducted by, Haron and Ahmad (2000), Kaleem and Isa (2003), Haron and Azmi (2005), Kasri and Kassim (2009), and Zainol and Kassim (2010) summarize that Islamic deposits are highly sensitive to the interest rate changes. These studies also confirm that Islamic banking depositors are more profit motivated than religious motivated. This means that depositors will increase their total deposits only when the rate of return is to increase. Otherwise, when the rates of return decrease, they will definitely decrease their total deposits in Islamic banks and they could switch their funds to the conventional banks. Therefore, Islamic customers are more profit motivated than religious motivated in their selection towards Islamic banking services.

In addition, How et al. (2005) suggests that interest rate risk management or rate of return risk management should be a concern to the Islamic banks particularly in the dual banking context. This is due to the differences in the interest rate sensitivity of assets and liabilities in the Islamic banks. Unlike the conventional banks that have more flexibility on the asset side, the Islamic banks have the fixed rate assets that are not sensitive to the changes in the market interest rates, while the liabilities are sensitive to interest rate changes. Therefore,

[11] Zairy Zainol and Salina H. Kassim, loc. Cit.

the Islamic banks could not react swiftly to changing interest rate and this lead to the higher exposure to rate of return risk.

In terms of asset side of the Islamic banks, Islam encourages the owners of capital to invest their money and become partners in order to share profits and taking risks in the business. However, s*hariah* does not permit additional profit or *riba* over what had been lent. Profits are only earned through legitimate business and trading. To remain consistent with religious structures, banks cannot charge interest rate on their lending operations, but have to use special modes of investment and financing that are also based on profit- and loss-sharing.

Islamic banks are required by *shariah* to apply the same principles of profit- and loss-sharing in their loan operation. Moreover, Islamic banks could offer various modes of financing; equity-based financing, debt-based financing, services-based financing. Some of the most common structures for bringing in non-*shariah* compliant debt lending to a *shariah*-compliant financing are the *musharakah* (joint venture), *ijarah* (lease), *mudharabah* (trust financing), *murabah* (cost-plus financing) and *istisna* (custom manufacturing) structures.

Empirical studies investigating the determinants of financing in Islamic banks are still meagre. The contribution of this study is to examine the effect of financial and selected macroeconomic variables on the level of deposit and financing of Islamic banks. To the best of author knowledge, this study is the first study on this field. Several empirical studies that have been conducted only focus on the effect of monetary policies on the Islamic banking financing (Kassim et al., 2007; Said and Ismail, 2008; Kader and Leong, 2009; Sukmana and Kassim, 2010; Ergec and Arlan, 2011).

Kassim et al. (2007) analyzes the impact of monetary policy shocks on the conventional and Islamic banks in a dual banking system environment focusing on Malaysian data covering the period from January 1999 to December 2006. The study finds that the Islamic banks' balance sheet items (deposit and financing) 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 finding seems to be similar the study by Ergec and

Arslan (2011) utilizing monthly data for the period between 2005:12 and 2009:07 based on VAR methodology and focusing on the Islamic banks in Turkey. The study finds that the deposit and financing of the Islamic banks are visibly influenced by interest rate changes. These results at least partly invalidate the assumption and argument that the Islamic banks are more stable compared to the conventional banks just because they are performing interest-free banking. Moreover, these confirm that Islamic banks are facing a serious interest rate risk.

Study by Kader and Leong (2009) specifically investigates the impact of interest changes on Islamic bank financing. Using Malaysian monthly data from 1999 to 2007, the study finds that any increase in the base lending rates would induce customers to obtain financing in the Islamic banks and vice versa. This indicates that Islamic financing customers are profit motivated in selecting Islamic bank services. If the customers expect the interest rate to decline, they would prefer conventional loans rather than BBA financing. It is due to that the instalments for existing BBA financing are more expensive than the instalments for existing conventional loans during times of falling interest rates. Hence, the demand for conventional loans increases while the demand for BBA financing falls. On the other hand, the profit motivated customers would prefer BBA financing, if they expect interest rate would rise in the future. The demand for BBA financing would rise. Hence the Islamic banks are exposed to commercial displaced risk.

These entire studies document that banks that offer Islamic financing are exposed to a higher rate of return risk than banks that do not offer the Islamic financing. This is due to the differences in the interest rate sensitivity of asset and liabilities in the Islamic banks. Unlike the conventional banks are that more flexibility on the asset side, the Islamic banks have the fixed rate assets that not sensitive to the interest changes. Therefore the Islamic banks cannot react swiftly to changing interest rate and this lead to a higher exposure to rate of return risk (Zainol and Kassim, 2010).

As discussed earlier, in the process of providing financial services, Islamic banks face various kinds of financial risks. One of them is rate of return risks as

suggested by the Islamic Financial Services Board (IFSB) (2005). A key source of rate of return risk resulted from a unique structure of the Islamic banks in that their liabilities as floating rate of return, but the assets in fixed-return assets, leading to the asset-liability mismatch. The asset-liability mismatch may occur when the financial terms of Islamic banks' assets and liabilities do not correspond. Thus, in the context of their overall balance sheet exposures, the Islamic banks are exposed to the asset-liability mismatch resulting from holding fixed-return assets such as *murabahah* that are financed by investment accounts, the holders of which expect a rate of return in line with the benchmark rates. An increase in the benchmark rates may result in investors or fund providers having expectations of higher rate of return. However, the Islamic banks cannot increase the rate of return on their deposits because their assets are mainly fixed return assets (*murabahah* or BBA). Unlike conventional banks that have more flexibility on the asset side, the Islamic banks have the fixed asset rate assets that not sensitive to the changes in market interest rate, while the liabilities are sensitive to interest rate changes. Therefore the Islamic banks cannot react swiftly to changing interest rate and this lead to higher exposure to rate of return risk.

As a consequence, the Islamic banks are more vulnerable to the interest rate/rate of return risk due to their asset-liability mismatch. This will lead to the displaced commercial risk (DCR) which involves the transfer of associated with deposits to equity holder. DCR implies that the Islamic banks may not be able to pay competitive rates of return as compared to its peer and other competitors. Deposits will have the incentive to seek withdrawal and to prevent the withdrawal; the Islamic banks will need to apportion part of their share of profit to the depositors (Zainol and Kassim, 2010).[12] Thus, the Islamic banks may be under pressure to pay a return that exceeds the rate that has been earned on assets financed by fund providers when the return of the fixed return assets is under-performing as compared with competitors' rates. They may decide to waive their rights to part or entire *mudharib* share of profit in order to satisfy and retain their fund providers and dissuade them from withdrawing their funds.

[12] Zairy Zainol and Salina H. Kassim, loc. Cit.

3. DATA AND METHODOLOGY

In determining the factors influencing the deposit and financing behaviour among the Islamic banks' customers in Indonesia, in line with the earlier studies, ten objective variables are being considered: *Mudharabah* investment deposits (LMI), *murabahah* financing (LMF), rate of return of the Islamic banks (Rr), deposit rate of the conventional banks (Dr), financing rate of the Islamic banks (Fr), lending rate of the conventional banks (Lr), industrial production index (LIPI), Jakarta Composite Index (LJCI), inflation rate (Inf) and number of Islamic banks' branch (LIB).

To examine the determinants of deposit and financing of the Islamic banks in Indonesia, the study formulates two different models for deposit and financing respectively, which can be represented as follows:

$$LMI_i = \alpha_0 + \alpha_1 Rr_i + \alpha_2 Dr_i + \alpha_3 LIPI_i + \alpha_4 LJCI_i + \alpha_5 Inf_i + \alpha_6 LIB_i + \mu_t \quad (3.1)$$

$$LMF_i = \beta_0 + \beta_1 Fr_i + \beta_2 Lr_i + \beta_3 LIPI_i + \beta_4 LJCI_i + \beta_5 Inf_i + \beta_6 LIB_i + \varepsilon_t \quad (3.2)$$

Where:

LMI : *mudharabah* investment deposit of the Islamic banks (in log form)

LMF : *Murabahan* financing of the Islamic banks (in log form)

Rr : Rate of return for 1-month *mudharabah* investment deposits of the Islamic banks

Fr : Financing rate (cost of borrowing) for *murabahah* financing of the Islamic banks

Dr : Deposit rate for 1-month time deposit of the conventional banks

Lr : Lending rate (cost of borrowing) of the conventional banks

LIPI : Industrial Production Index (in log form)

LJCI : Jakarta composite index (in log form)

Inf : Inflation rate

LIB : Number of Islamic banks' branch (in log form)

μ & ε : Error term

The *Mudharabah* investment deposit (LMI) is taken as a proxy for the level of deposits of the Islamic banks, while m*urabahah* financing (LMF) is used to represent the level of financing of the Islamic banks in Indonesia. Rate of return of the Islamic banks (Rr) and deposit rate of the conventional banks (Dr) are considered as financial variables in the literature and have always been featured as one of the important considerations in explaining the banking customers' behaviour. Rate of return for 1-month *mudharabah* investment deposits and deposit rate for 1-month time deposit are considered to represent rate of return and deposit rate respectively. On the asset side, the demand for Islamic financing (LMF) is considered to be influenced by financing rate of the Islamic banks (Fr) and lending rate of the conventional banks. Financing rate of *murabahah* financing and lending rate are to represent cost of borrowing.

Industrial Production Index (LIPI) is employed as the proxy to income, a major macroeconomic indicator affecting the balance sheet items (deposit and financing) of the Islamic banks. The index is commonly used as proxy for economic activity or national income primarily due to the unavailability of GDP measured on a monthly basis (Rohma, 2006; Kassim et al., 2007; Kasri and Kassim, 2009). The stock market will be represented by Jakarta Composite Index (LJCI). LJCI is included as a determinant factor affecting the level of deposit and financing of the Islamic banks. This variable represents the future expectation of the economy and level of people confidence towards the country's economy. CPI is used as a proxy for inflation (I). Greater uncertainty should raise savings since risk-averse consumers set resource aside as a precaution against possible adverse changes in income and other factors. This study also includes number of Islamic banks' branch (IB) as a determinant affecting the deposit and financing of the Islamic banks. It is believed that number of Islamic banking branches determine the mobilized funds as well as the demand of financing of Islamic banks.

Banking data are obtained from the various publications of the Indonesian central bank which covers all banks in Indonesia. Macroeconomic data, including industrial production index and inflation data are taken from the National

Statistical Bureau of Indonesia, while the Jakarta Composite Index are taken from Bloomberg. This study uses monthly data covering the period January 2004 to April 2011.

Based on the discussion and elaboration presented in theoretical framework is that Muslims' behaviour is dominantly determined by religious teachings. Those are considered to have a significant impact on the decision making process of Muslims and even to have an influence on their selection to Islamic banking services. It is assumed that Muslim banking customers define rationality differently compared to the conventional banking customers. The Muslim banking customers are not only motivated by profit, but more importantly, Muslims customers have consideration for the rewards/punishments in the hereafter. The Islamic banks' customers are assumed to be more guided by religious motive than financial motives in their banking selection. They may sacrifices the financial incentives for the purpose of their religious incentives. However it is hard to believe that Muslim customers are not influenced by any other determinant factors. Hence, the study formulates the testable hypotheses that are in line with theoretical frameworks. The hypotheses of the study are as follows:

Table 3.1: Hypothesis of the Study

INDEPENDENT VARIABLES	**SYMBOL**	**DEPENDENT VARIABLES**	
		Deposit Function (LMI)	**Financing Function (LMF)**
Rate of Return	Rr	No significant impact	No significant impact
Deposit Rate	Dr	No significant impact	No significant impact
Financing Rate	Fr	No significant impact	No significant impact
Lending Rate	Lr	No significant impact	No significant impact

Industrial Production Index	LIPI	positive effect	Positive effect
Jakarta Composite Index	LJCI	Negative effect	Positive effect
Inflation Rate	Inf	Positive effect	Positive effect
Number of Islamic Banks	LIB	Positive effect	Positive effect

To examine the determinants of deposit and financing of the Islamic banks, the study employs time-series investigation techniques namely the Vector Autoregression model which includes the cointegration and impulse response function (IRF) analysis. The standard investigation step for time series econometric techniques are as follows: (i) unit root and cointegration tests; (ii) VAR specification and estimation; and (iii) impulse response function (IRF) and variance decomposition analysis.

The first test of the analysis is to test for the presence of unit root of the variables in the system using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. Once the stationarity condition is examined, the next step is to conduct a cointegration test. A multivariate test for cointegration developed by Johansen (1988) and Johansen and Juselius (1990) is used in this study. The Johansen-Juselius (JJ) procedure of cointegration is based on the maximum likelihood estimation of the VAR model. The typical VAR model for Johansen-Juselius cointegration test can be represented as follows:

$$X_t = \mu + \Pi_1 X_{t-1} + ... + \Pi_k X_{t-k} + e_t \quad (3.3)$$

Where X_t is a vector of non-stationary variables integrated of the same order, μ is a vector of intercept, Π_k is a matrix of coefficients and e_t is an vector of error term. The trace statistic and maximum eigenvalue statistics are calculated to test the presence of cointegrating vectors. If the trace statistic and maximum eigenvalue are higher than their t-statistic, the null hypothesis of no cointegration (r = 0) is rejected and it can be concluded that there exist long run relationship

among variables in the vectors, or all variables are moving together in the long run.

If the findings are not cointegrated, it is suggested to use the VAR model in first difference. However, if the variables are found to be contegrated, a Vector Error Correction Model (VECM) will be used to investigate the dynamic interactions among the variables in the system (Engle and Granger, 1987). The vector error correction model (VECM) is as follows:

$$\Delta Y_t = \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \ldots + \Gamma_{l-1} \Delta Y_{t-l+1} + \Pi Y_{t-l} + \mu + \eta_t, \quad t=1,,,T \qquad (3.4)$$

Where ΔY_t contains the change of the variables, the Γ's are estimated parameters. Δ is a difference operator, η_t is a vector of impulses that represent the unanticipated movement in Yt, with ηt ~ niid (0,Σ) and Π is the long-run parameter matrix. With r cointegrating vectors ($1 \leq r \leq 6$), Π has rank r and can be decomposed as $\Pi = \alpha\beta'$, with α and β both (p x r) matrices of full rank. The adjustment coefficients in matrix α and β refer to the coefficients of the error correction terms.

Engle and Granger argued that that VECM has an important advantage that can distinguish between short-run and long-run forms of Granger causality. The VECM restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationship while allowing short-run adjustment dynamics. The cointegration terms are the correction terms since a series of partial short-run adjustment correct gradually the deviation from the long-run equilibrium.

Apart from the battery of time series techniques, the study also employs variance decomposition analysis (VDC) to further delve into the dynamics interaction among the variables. Variance decomposition analysis (VDC) is a fraction of forecast error variance of a variable attributed to shock in other variable particularly to inference of relative strength of innovation in the variable of interest. it is generally acknowledged as a convenient method of providing a

literal breakdown of the change in the value of a variable in a given period rising from changes in the same variable and in other variables during previous period.

4. RESULTS AND DISCUSSIONS

5.1. Unit Root Test and Johansen Cointegration Test Results

Unit root tests are conducted to determine the stationarity of the series. To this end we apply Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) stationarity tests on all the time series involved in the study. The results of the unit root tests are summarized in Table 5.1.

Since the unit root test results show that each of the data series is $I(1)$, the cointegration test based on the Johansen procedure is conducted. The maximum eigenvalue and trace statistics are calculated to test the null hypothesis of r=0, i.e. no cointegration, versus the alternative hypothesis of cointegration. In other worlds, at least one cointegration vector exists for series of variables in the system. The existence of the cointegration vector suggests that the variables in the system have a long-run equilibrium.

Table 5.2 presents the results of the Johansen maximum likelihood cointegration test. Both trace statistic and maximum eigenvalue statistic indicate that there are three cointegrating vectors in model 1 while two cointegrating vectors in model 2. Thus, we reject the null hypothesis of no cointegrating vector in the system under both test statistics at 5 percent level of significance. The results suggest that the presence of a strong long-run relationship between dependent variables and their determinants. This implies that all of series in the deposits and financing functions move together in the long-run even if some move at different speed than others in the short-run. Our finding is consistent with Haron and Azmi (2005), Kasri and Kassim (2009), and Kader and Leong (2009).

5.2. Error Correction Models

Since *mudharabah* investment deposit (model 1) and *murabahah* financing (model 2) of the Islamic banks and their corresponding explanatory variables exhibit cointegrating (long-run) relationship, VECM is estimated to model the short-run dynamics of each system. The size and the statistical significant of the ECT (error correction term) measures the extent to which each dependent variable has the tendency to return to its long-run equilibrium.

The estimates of the error correction terms are given in table 5.4. The results reveal that the ECT is negative and statistically significant for Islamic deposit function (model 1). The significance of the ECT confirms the existence of long-run relationship among the variables as documented in earlier Johansen cointegration test. This implies that the dependent variable has the tendency to adjust to any deviation in the long-run equilibrium. The estimated coefficient of the ECT indicates that the speed of adjustment among the variables is towards long-run equilibrium within a year. The Islamic deposits correct about 19% of the deviation from the long-run relationship in a single year.

The estimated coefficients of the lagged first different variable capture short run effects (Engle and Granger, 1987). Surprisingly, this study finds inverse behaviour of Islamic banks' customers. This is reflected by the opposite signs of coefficient of the variables in the short-run. Conceptually, the study hypotheses that the customers of Islamic banking system define rationality differently compared to the conventional banking customers. They are not only motivated by profit, but more importantly, Muslim customers have consideration for religious incentives and blessing from Allah. The Islamic banks' customers are assumed to be more guided by religious motive than financial motives in their banking selection. They would sacrifice financial incentive for the purpose of religious incentives. Thus, any changes in rate of return of the Islamic banks and deposit rate of the conventional banks should not have any significant impact on deposit of the Islamic banks.

On the contrary, the study finds that any change in the rate of return does have a significant impact on the level of deposit in the Islamic banking system. Rate of return (Rr) has a positive and statistically significant effect on

mudharabah deposit investment (LMI) at 1 percent level in the short-run. The short-run variation in *mudharabah* investment deposit is determined by variations in rate of return. The adjustment is rather small where only about 1.1% of the deviation is corrected by the changes in rate of return. Thus, when the rate of return of the Islamic banks is positive, individuals tend to increase their deposits. The higher rate of return increases the level of Islamic deposit. This finding confirms that the Islamic depositors are guided by profit motive in the short-run; contradictory to the assumption that the Islamic banking customers are mainly guided by religious motives. The implication of this finding is that the Islamic banks might be exposed to rate of return risk. The depositors will increase their deposits only when the rate of return increases. Otherwise, when the rate of return decreases, they will definitely decrease their total deposits in the Islamic banks and they could switch their funds to the conventional banks. This also leads to the problem of displaced commercial risk (DCR) in the Islamic banking system. An increase in the benchmark rates may result Islamic depositors having expectations of higher rate of return. However, the Islamic banks cannot increase the rate of return on their deposits because their assets are mainly fixed return assets (*murabahah* or BBA). Unlike conventional banks that have more flexibility on the asset side, the Islamic banks have the fixed rate assets that not sensitive to the changes in market interest rate, while the liabilities are sensitive to interest rate changes. Therefore the Islamic banks cannot react swiftly to changing interest rate and this lead to higher exposure to rate of return risk.

The short-run effect of deposit rate of conventional banks (Dr) to *mudharabah* investment deposit (LMI) appears to be negative but statistically insignificant. This suggests that the deposit rate of the conventional banks have insignificant impact on the Islamic banks' total deposits. The finding implies the absence of a potential deposit-flight from the Islamic banks to the conventional banks when the interest rate of the conventional banks increases. This finding concurs well with that of Kasri and Kassim (2009). However, this finding is contrary to the results obtained by of Haron and Ahmad (2000), Haron and Azmi (2005), and Zainol and Kassim (2010). The conflicting results could be due to the

different methodology and study period adopted by each study. However, it is important to note that the direction of the short-run effect of deposit rate of the conventional banks (Dr) to *mudharabah* investment deposit (LMI) is a negative sign. This potentially leads to the deposit-flight in the long run as confirmed to the existence of a long-run relationship among the variables when the interest rate of the conventional banks (deposit rate) increases.

The study also finds that macroeconomic uncertainty as measured by the inflation rate (Inf) has a positive and statistically significant effect on Islamic deposits in the short run. This supports the theory that higher inflation increases savings. The higher inflation will encourage people those who are risk-averse to save their money. This provides support of the precautionary motives of Islamic depositors in the face of increased economic uncertainty. This finding is consistent with the earlier studies by Athukorala and Sen (2001), Touny (2008) and Oscan and Ertac (2003). The short-run variations of the Islamic deposits are also significantly affected by movement in the industrial production index (LIPI) and number of Islamic banks' branch (LIB). Surprisingly, the direction of those two explanatory variables is negatively effect to the level of Islamic deposit. This finding tends to support for the permanent income hypothesis of the conventional theory that higher growth of economic lead to lower saving because of anticipated higher future income. Customers tend to dissave during period of high growth. The short-run negative impact of the number of the Islamic banks' branch on *mudharabah* investment deposits is contradictory to our prior assumption that the number of Islamic banks' branch has a positive relationship with the *mudharabah* investment deposits. This contradicting direction is probably due to a limit period of the study. Additionally, stock market has no significant impact on *mudharabah* investment deposit in the short-run.

For model 2, the ECT is negative and statistically significant for Islamic deposit function. The significance of the ECT confirms the existence of long-run relationship among the variables as documented in earlier Johansen cointegration test. This implies that the dependent variable has the tendency to adjust to any deviation in the long-run equilibrium. The estimated coefficient of the ECT

indicates that the speed of adjustment among the variables is towards long-run equilibrium within a year. Thus, the Islamic financing exhibits 0.05% of the system disequilibrium in a single year.

However, the estimated coefficients of the lagged first different variables which describe short run effects show that in the short run, all determinants show different effects on the Islamic financing function and overall are statistically insignificant. This finding implies that financial variables (financing rate of the Islamic banks and lending rate of the conventional) and selected macroeconomic (industrial production index, inflation rate and stock market) as well as the Islamic banking network have no significant impact on *murabahah* financing of the Islamic banks in the short-run.

Based on the VECM short-run regression effect, it is important to highlight that the demand for Islamic loanable funds is not significantly affected by financial consideration (cost of borrowing) in the short-run. This finding is seemly to be consistent to our general hypothesis that Muslim banking customers define rationality differently compared to the conventional banking customers. The Muslim banking customers are not only motivated by profit, but more importantly, Muslims customers have consideration for the rewards and blessing of Allah in the hereafter. The Islamic banks' customers are assumed to be more guided by religious motive than financial motives in their banking selection. They may sacrifice the financial incentives for the purpose of their religious incentives.

5.5. Variance Decomposition Analysis

The variance decomposition (VDC) analysis provides literal breakdown of the change in the value of a particular variable in a given period arising from changes in the same variable and other variables during previous period. In this study, therefore, it is used to quantify the contribution of a particular variable that determine the balance sheet items of Islamic banks in Indonesia in explaining variation in other variables. The ordering of the variables for the VDC in this study is based on the Cholesky decomposition method which suggests the following order of the variables: LMI, LMF, Rr, Dr, Fr, Lr, LIPI, LJCI, Inf, and

LIB. The result from the VDC method for Islamic deposit and Islamic financing are presented in table 5.4 and 5.5 respectively.

Table 5.4 provides the VDC results for the deposit of the Islamic banks and its determinants. Variation in other variables contribute to approximately 63% of the variation in the deposit of the Islamic banks (LMI), indicating that the Islamic deposit is a highly exogenous variable which is sensitive to variations in the other variables. In particular, innovations in deposit rate of the conventional banks (Dr) account for around 22% of the forecast error variance of the Islamic deposit (LMI) at the 20-month horizon. It suggests that deposit rate of the conventional deposits is important factors in affecting changes in the level of deposit in the Islamic banks (*mudharabah* investment deposit). The finding is in line with the previous result on the VECM short-run effect which suggests that deposit rate of the conventional banks and rate of return of the Islamic banks influence to the level of deposit in the Islamic banks in the long-run. This is consistent with the earlier finding by Kasri (2009) and Zainol and Kassim (2010). The vulnerability of Islamic deposit to variations in deposit rate of the conventional banks and rate of return of the Islamic banks suggest that any changes in both rates will affect the deposit of the Islamic banks. The Islamic banks are exposed to the interest rate risk. Consequently, among others, the stability of the Islamic banking system is highly dependent on the stability of conventional banking system.

Innovation in inflation rate (Inf) is significant in accounting for the forecast error variances of Islamic deposit (LMI), at around 23.9% at the 20-month horizon. This suggests that the Islamic depositors are risk-averse in placing their money in Islamic accounts in the long-run. This finding is consistent with the VECM short-run effect that strengthens the precautionary motives of Islamic depositors in the face of increased inflation. In addition, the forecast error variances of Islamic deposit (LMI) are explained by 8.5% and 4.4% of the variations in the LIPI and LIB respectively.

Other endogenous variables suggested by the results of VDC analysis in table 5.4 are rate of return of the Islamic banks (Rr) and deposit rate of the

conventional banks (Dr). Approximately 58.6% variations of rate of return of the Islamic banks are explained by variation of the other variables, while only around 16% variations of deposit rate of the conventional banks are attributable to variations of the others. Interestingly, the VDC result for rate of return of Islamic deposit (Rr) indicates that variations in the deposit rate of the conventional deposit (Dr) are the most important factor affecting the variation of the rate of return. Specifically, variations of Dr contribute to 35.5% of the rate of returns' fluctuation. On the other hand, variations of deposit rate (Dr) are mainly explained by its own variance rather that of the other variables. Approximately 83% of the deposit rate variance is attributed by its own variance, while 1% and 4% of the variance is attributable to rate of return and Inflation variance. The dominant influence of the variation of deposit rate to rate of return confirm that rate of return is benchmarking to deposit rate of the conventional banks. This finding indicates that rate of return given to the Islamic depositors is mainly determined by deposit rate of the conventional banks.

The VDC results for the variation of the financing in the Islamic banks (LMF) to variation of other variables are provided in table 5.5. In the case of Islamic financing (LMF), 68.4% of the variations are contributed by other variables. Among all the variations, inflation rate (Inf) is the most significant variable, explaining about 22.9% of the financing of the Islamic banks (LMF) forecast error variance at a 20-month horizon. This result is in line with our hypothesis that the rise in expected inflation means that the cost of borrowing has declined causing the demand for loanable funds increase.

Lending rate of the conventional banks (Lr) accounts for about 10.6% of the forecast error variance of Islamic financing (LMF) at the 15-month horizon. Innovations in financing rate of the Islamic banks (Fr), however, are small in accounting for the forecast error variance of the Islamic financing, at around 3.7%. The significant influence of Lr innovation to Islamic deposit variance suggests that the financing of the Islamic banks is vulnerable to the changes in the lending rate of the conventional banks (interest rate). This may lead to customers' migration due to borrowing cost (lending rate) changing. Thus, any change in the

market interest rate would, on the asset side, lead to a substitution effect between Islamic and conventional banks financing. As for the objective variables, the variation of Islamic financing is seemly significant to be explained by innovation in the number of Islamic banks' branch (16.1%), industrial production index (10.2%) and stock market (5.5%) at 20-month horizon. The results indicate the Islamic financing is a highly endogenous variable which is sensitive to variations in the other variables. All those VDC findings are in contrast to the earlier VECM short-run effects which suggest all variables in the financing model have no significant impact on the demand for loanable funds in the Islamic banks in the short-run.

Other endogenous variables provided by the VDC analysis are financing rate of the Islamic banks (Fr) and lending rate of the conventional banks (Lr). Approximately around 49% variation of the financing rate (Fr) are explained by variations of the other variables, while 76.5% variations of lending rate are attributed by variations of the others. Interestingly, around 13.8% of the forecast error variances of financing rate (Fr) are attributable to variations of Islamic financing (LMF) at the 20-month horizon. The innovation in lending rate of the conventional banks (Lr) seems to be not significant in explaining the forecast error variance of financing rate of the Islamic banks (Fr), at around 1.1%. In contrast, variation in macroeconomic variables namely LIPI and Inf are significantly explaining the Fr variance, accounting for 20.9% and 10.2% respectively at 20-month horizon. On the other hand, variations in lending rate of the conventional banks are mainly explained by its own variance (47.3%). Interestingly, around 23.5% forecast error variance of the lending rate are contributed by the innovation of the financing rate of the Islamic banks (Fr), indicating that any changes in financing rate of the Islamic banks will affect the lending rate of the conventional banks. For macroeconomic variables, only innovations in LIPI which account for 10.7% are significant in explaining the Lr variance.

5. CONCLUSIONS AND RECOMMENDATIONS

The study attempts to examine the factors affecting Islamic banks' balance sheet in Indonesia. By employing the Vector Autoregression (VAR) Models, the study analyzes the importance of financial variables (rate of return, deposit rate, financing rate and lending rate), selected macroeconomic variables (economic growth, stock market, inflation) and the number of the Islamic banks' branch on deposit and financing of the Islamic banks in Indonesia. The period of observation is January 2004 to March 2011.

The *mudharabah* investment deposit – the proxy for the level of deposit in the Islamic banks – has a positive and statistically significant relationship with rate of return of the Islamic banks and negative relationship with deposit rate of the conventional banks. This implies that higher rate of return and lower deposit rate are associated with higher level of the Islamic deposits, suggesting that the return to deposit is a significant determining factor to save in the Islamic banks. The finding confirms that the Islamic depositors are mainly guided by profit motive in their banking selection in the short-run; contradictory to the assumption that the Islamic banking customers are mainly guided by religious motives than any other motives. The depositors will increase their deposits in the Islamic banks only when the rate of return given increases. Otherwise, when rate of return decreases, they will definitely decrease their total deposits in the Islamic banks and they could switch their funds to the conventional banks. As a consequence, Islamic banking system is exposed to displaced commercial risk (DCR). Unlike conventional banks that have more flexibility on the asset side, the Islamic banks have the fixed rate assets that not sensitive to the changes in market interest rate, while the liabilities are sensitive to interest rate changes. Therefore the Islamic banks cannot react swiftly to changing interest rate and this lead to higher exposure to rate of return risk.

The study also finds that inflation rate (Inf), industrial production index (LIPI) and number of the Islamic banks' branch (LIB) has a significant effect on *mudharabah* investment deposit (LMI) banks in the short-run. The study provides support of precautionary motives of Islamic depositors. On the asset side, *murabahah* financing as a proxy for financing of the Islamic banks has a negative

relationship with financing rate of the Islamic banks and positive relationship with lending rate of the conventional banks in the short-run. However, all determinants are statistically insignificant in affecting Islamic financing in the short-run. Thus, in the short-run, the financial consideration (cost of funds) has no significant impact on the demand of loanable funds in the Islamic banks.

Based on the VDC results, Islamic deposit is a highly exogenous variable which sensitive to variations in other variables, specifically innovation in deposit rate of the conventional banks (Dr) and rate of return of the Islamic banks respectively. The vulnerability of Islamic deposit to variations in rate of return of the Islamic banks and deposit rate of the conventional banks suggest that any changes in both rates will affect the deposit of the Islamic banks. The Islamic banks are exposed to the interest rate risk. Consequently, among others, the stability of the Islamic banking system is highly dependent on the stability of conventional banking system.

In the asset side, Islamic financing (LMF) is also a highly endogenous. Among all the variations, inflation rate (Inf) is the most significant variable, followed by number of Islamic banks' branch (LIB), lending rate of the conventional banks (Lr), and industrial production index (LIPI). The significant influence of Lr innovation to LMF variance suggests that the demand for loanable funds in the Islamic banks is vulnerable to the changes in the lending rate of the conventional banks (interest rate). This may lead to customers' migration due to borrowing cost (lending rate) changing. Thus, any change in the market interest rate would, on the asset side, lead to a substitution effect between Islamic and conventional banks financing.

Other interesting endogenous variables provided by VDC result show that variations in the deposit rate of the conventional banks (Dr) are the most important factor affecting the variation of rate of return in the Islamic banks. Otherwise, variations of deposit rate (Dr) are mainly explained by its own variance rather that of other variables. The dominant influence of the variation of deposit rate to rate of return confirm that rate of return is benchmarking to deposit rate of the conventional banks. This finding indicates that rate of return given to

the Islamic depositors is mainly determined by deposit rate of the conventional banks.

5.1. Recommendations

The study finds that the Islamic banks in Indonesia within its existing financial infrastructure as well as the structure of products and services are exposed to rate of return, interest rate and displaced commercial risk. The Islamic bank is vulnerable to any change in rate of return and interest rate of the conventional banks. Thus, based on the finding of the study, some recommendations are concerned in order to develop the Islamic banking industry in Indonesia especially in order to enhance its competitiveness and endurance to face the ASEAN market integration in 2015. They are:

1. The policy makers should be aware that the Islamic banks' balance sheet (deposit and financing) are vulnerable to the rate of return risk. As suggested by Bacha (2004), to protect Islamic banks from the risks that caused by the interest rate movements, reducing the maturity on loans on the asset side is the only way that Islamic banks can do but this method is dangerous since it can harms the Islamic banks structure in general. Hence, two alternatives are recommended for the Islamic banks; *first*, the Islamic banks should move away from fixed rate instruments like *murabahah* into profit- and loss-sharing (PLS) contracts like *mudharabah* and *musharakah* and rent-based (*ijarah*) contracts. The advantage of the PLS contracts is that the financing will be detached from the rate movements since they are directly independent on profit or loss from the financed business. Additionally, returns on PLS contracts are based on real sector performance. Thus, interest rate is an exogenous factor in PLS. In the case of leasing (*ijarah*), the cost of financing is based on the rental rate which is flexible and not fixed like *murabahah* or BBA rate. The rental can be revised periodically to reflect market conditions. Hence, the Islamic banks would be in a better position to mitigate the interest rate risks compare their ability under fixed-asset rate system. *Secondly*, a risk-

sharing agreement between Islamic banks and their customers should take into account that the customers of long maturity loans agrees to partially compensate the banks if the average rate of return exceeds the predetermined level. In return, the banks agree to reduce the mark-up on outstanding balance if the rate is below the predetermined level.

2. The existence of displaced commercial risk between the Islamic banks and conventional banks which is shown by the tendency of Islamic depositors to withdraw their funds and put them in the conventional banks when rate of return given by the Islamic banks is lower than deposit rate of its conventional counterparts and vice versa. So, the existence of the displaced risk in the Islamic banks in Indonesia should be concerned especially by the Islamic banks management and the policy makers. To mitigate the displaced commercial risk, the Islamic Financial Services Board (IFSB) has introduced the Profit-Equalization Reserves (PER) concept which is the amount set aside by the Islamic financial institutions out of their gross income in order to maintain a certain level of rate of return for their depositors. In Malaysian case, the Central Bank of Malaysia has obliged all the Islamic banks in the country to implement the PER mechanism to mitigate the fluctuation of rate of return. The PER allows the Islamic banks to save up to 15 percent of the total gross income in a separate provision. This provision/reserve will be used whenever Islamic banks record a low profit. However, the PER concept has not been popular for Islamic bank regulations in Indonesia. Thus, Bank Indonesia as the monetary authority as well as the banking authority should take into consideration the impact of market interest rate volatility on the Islamic banks by implementing the PER concept in the Islamic banking system in Indonesia.
3. Since the finding of the study shows that the Islamic banking customers are mainly guided by profit motive in their banking selection, the Islamic bank should educate and motivate their customers to save and invest in *halal* activities. The *Ulama* (Islamic scholars) and intellectuals should also

educate the Muslim to change their behavior and avoid the *riba* transaction. Finally, an individual Muslim should be aware that the investment choices they made should not only be based on the profit maximization but also on those returns in the hereafter. Therefore, the decision to place deposit as well as demand for loanable funds in the Islamic banks is not merely to earn profit but also to get blessing from Allah SWT.

4. The significant impact of number of the Islamic banks' branch to level of deposit and financing in the Islamic banks should be an input for Islamic bankers to wider their networks, offices, services and products to achieve its national target of market share, 5 percent. The underperformance of Islamic banks (market share) in the country is because, among others, its lack of infrastructure especially banking office networks that has not reached all regions in Indonesia. Widening the Islamic banks' offices throughout the country is a part of preparation to welcome the ASEAN market integration in 2015.
5. The study is however is conducted within a limited time period and variables. Further extension of the study should consider a wider scope of deposit and financing by conducting the same approach on different types of deposit and financing available in the Islamic banks. The study will then identify the risk exposures across different types of deposit and financing. To further extension of the study, it also could consider the determinants of rate of return of the Islamic banks. Since most of the study focused on the determinants of Islamic banks' deposits, the determinants of the rate of return should also be given an equal attention by researches. To extend the determinants of customers' motivation (religious motive or profit motive) in their banking selection process, religious variables should be considered as a determinant for people to place funds and demand for loanable funds in the Islamic banks.

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Table 5.1: Results of the Unit Root Test

Variables	Level		Fist Difference	
	ADF	**PP**	**ADF**	**PP**
LMI	-0.165284	-0.054373	-9.603359*	-9.864718*
LMF	-2.703627	-1.614194	-6.790992*	-7.403204*
Rr	-2.556842	-3.364179**	-12.56821*	-13.32315*
Dr	-2.974756**	-1.937182	-4.600347*	-4.644122*
Fr	-1.802449	-1.931137	-4.089682*	-7.813085*
Dr	-1.055309	-1.300326	-2.800901**	-2.801897**
LIPI	-2.472728	-3.030264**	-14.76739*	-15.47081*
LJCI	-0.989639	-0.960495	-7.120844*	-7.142399*
Inf	-0.806505	-0.78191	-7.53802*	-7.53802*
LIB	0.195214	0.036433	-4.430792*	-8.446806*

Note: * and ** denote significance at 1% and 5% levels respectively. The ADF and PP tests are based on the models with constant and trend.

Table 5.2: Results of the Johansen Cointegration Test

Model 1 (*Mudharabah* Investment Deposit)				
Nul Hyphothesis	**Trace Statistic**	**0.05 Critical Value**	**Max-Eigen Statistic**	**0.05 Critical Value**
r = 0	179.4598*	125.6154	60.26051*	46.23142
r ≤ 1	119.1993*	95.75366	47.54531*	40.07757
r ≤ 2	71.65394*	69.81889	30.8454	33.87687
r ≤ 3	40.80854	47.85613	17.54325	27.58434
r ≤ 4	23.26529	29.79707	14.90549	21.13162
r ≤ 5	8.359805	15.49471	7.843605	14.2646
r ≤ 6	0.5162	3.841466	0.5162	3.841466
Model 2 (*Murabahah* Financing)				
Nul Hyphothesis	**Trace Statistic**	**0.05 Critical Value**	**Max-Eigen Statistic**	**0.05 Critical Value**
r = 0	182.1578*	150.5585	52.11229*	50.59985
r ≤ 1	130.0455*	117.7082	48.51752*	44.4972
r ≤ 2	81.52794	88.8038	27.0478	38.33101
r ≤ 3	54.48015	63.8761	21.64313	32.11832
r ≤ 4	32.83702	42.91525	15.89685	25.82321
r ≤ 5	16.94017	25.87211	12.16938	19.38704
r ≤ 6	4.770782	12.51798	4.770782	12.51798

Note: * denotes rejection of the null hypothesis at the 5 percent significance level.

Table 5.3: Estimation of Error Correction Models

Variables	Model 1 *Mudharabah* Investment	Model 2 *Murabahah* Financing
ECT	-0.188224 [-4.82080]*	-0.000593 [-2.03010]**
Rr	0.011685 [2.49851]*	-
Fr	-	-0.002537 [-1.14163]
Dr	-0.002072 [-0.30671]	-
Lr	-	0.004649 [0.69241]
LIPI	-0.422667 [-3.21021]*	0.003995 [0.05717]
LJCI	-0.051789 [-0.80799]	0.013665 [0.35639]
Inf	0.004335 [2.08546]**	0.001409 [1.15478]
LIB	-0.72398 [-3.15437]*	-0.106541 [-0.87789]

Note: * and ** denote significance at 1% and 5% levels respectively.

Table 5.4: Variance Decomposition of Islamic Deposits

Variance Decomposition	Period	Innovation in						
		LMI	**Rr**	**Dr**	**LIPI**	**LJCI**	**Inf**	**LIB**
Mudharabah Investment	1	100.000	0.000	0.000	0.000	0.000	0.000	0.000
(LMI)	5	83.499	0.873	1.297	11.488	1.205	0.940	0.697
	10	61.372	2.874	10.933	11.520	0.876	9.475	2.950
	15	46.334	2.920	18.926	9.405	0.639	17.615	4.160
	20	37.122	2.754	22.642	8.561	0.509	23.940	4.472
Rate of Return	1	0.590	99.410	0.000	0.000	0.000	0.000	0.000
(Rr)	5	13.691	71.851	5.147	6.122	1.651	1.124	0.415
	10	12.668	50.060	28.700	5.009	1.523	1.623	0.417
	15	10.858	42.865	35.917	4.659	3.175	1.748	0.778
	20	10.400	41.211	35.510	4.491	4.714	2.850	0.824
Deposit Rate	1	6.276	7.327	86.397	0.000	0.000	0.000	0.000
(Dr)	5	5.871	1.057	89.871	2.577	0.081	0.368	0.174
	10	3.349	1.103	90.708	2.952	0.979	0.498	0.412
	15	3.467	1.035	86.658	2.768	3.191	2.277	0.603
	20	3.436	1.076	83.934	3.002	3.834	4.045	0.674
Indutrial Production Index	1	0.130	3.495	0.124	96.250	0.000	0.000	0.000
(LIPI)	5	1.341	4.172	8.048	74.212	0.275	11.439	0.514
	10	1.181	3.790	17.684	65.674	0.274	10.829	0.568
	15	1.149	3.678	19.862	63.010	0.387	11.217	0.697
	20	1.137	3.645	19.731	62.162	0.487	12.114	0.724
Jakarta Composite Index	1	0.506	3.701	1.723	2.842	91.228	0.000	0.000
(LJCI)	5	0.589	12.950	19.158	4.152	60.475	2.156	0.519
	10	0.769	13.237	24.049	5.653	48.330	3.511	4.450
	15	1.050	13.666	23.601	5.375	44.180	3.198	8.931
	20	1.316	16.342	24.992	4.855	40.243	3.055	9.198
Inflation	1	2.645	0.501	0.010	1.541	0.158	95.145	0.000
(Inf)	5	3.056	2.294	16.337	9.914	6.410	61.839	0.150
	10	2.259	3.324	15.789	13.288	15.925	48.992	0.424
	15	2.486	4.416	13.383	12.748	22.941	43.547	0.479

	20	2.537	4.377	13.526	11.943	24.182	41.836	1.598
Islamic Banks' Branch (LIB)	1	0.292	1.574	3.157	0.963	1.565	0.395	92.053
	5	1.584	25.497	1.137	1.009	13.302	4.105	53.366
	10	5.211	32.965	0.839	1.782	16.271	9.875	33.057
	15	8.936	30.376	4.632	2.941	14.001	14.926	24.189
	20	9.482	23.667	15.922	3.204	10.681	18.801	18.244

Table 5.5: Variance Decomposition of Islamic Financing

Variance Decomposition	**Period**	**Innovation in**						
		LMF	**Fr**	**Lr**	**LIPI**	**LJCI**	**Inf**	**LIB**
Murabahah Financing (LMF)	1	100.000	0.000	0.000	0.000	0.000	0.000	0.000
	5	93.390	0.204	2.641	0.452	0.387	2.616	0.311
	10	64.440	1.027	8.379	3.853	3.929	14.821	3.550
	15	42.871	2.645	10.615	7.451	6.217	21.002	9.199
	20	31.567	3.792	9.783	10.219	5.568	22.922	16.149
Financing Rate (Fr)	1	6.977	93.023	0.000	0.000	0.000	0.000	0.000
	5	10.165	65.373	2.413	14.027	0.667	5.653	1.702
	10	12.618	54.883	1.950	20.144	0.548	8.170	1.687
	15	13.716	51.257	1.802	21.053	0.684	9.878	1.609
	20	13.888	50.267	1.891	20.911	1.164	10.298	1.581
Lending Rate (Lr)	1	2.862	0.186	96.952	0.000	0.000	0.000	0.000
	5	0.745	3.530	91.179	0.468	2.432	1.607	0.041
	10	4.038	20.221	68.069	2.919	2.585	0.990	1.178
	15	7.735	25.505	51.505	8.504	2.102	1.691	2.959
	20	8.718	23.564	47.378	10.788	2.570	3.142	3.841
Indutrial Production Index (LIPI)	1	1.976	1.053	0.246	96.725	0.000	0.000	0.000
	5	8.029	3.151	9.562	68.448	0.751	9.832	0.228
	10	8.072	6.881	12.791	61.588	0.707	9.170	0.789
	15	8.882	8.501	11.901	58.932	0.655	9.620	1.510
	20	9.216	8.455	11.463	57.829	0.634	10.321	2.082
Jakarta Composite Index (LJCI)	1	1.962	0.125	6.937	1.401	89.575	0.000	0.000
	5	1.908	4.230	11.483	1.612	77.860	1.407	1.499
	10	2.713	14.518	9.694	1.536	66.660	2.079	2.800
	15	2.676	14.017	16.923	2.840	55.079	1.876	6.588
	20	2.332	13.485	20.528	2.957	49.969	2.371	8.358

Inflation	1	0.254	4.563	0.095	2.207	0.044	92.837	0.000
(Inf)	5	0.544	2.568	16.847	11.057	9.999	58.684	0.301
	10	0.902	5.372	12.744	7.798	21.149	51.679	0.355
	15	1.134	4.761	14.340	6.371	28.811	43.550	1.033
	20	1.062	5.829	14.550	6.131	28.195	38.619	5.615
Islamic Banks' Branch	1	0.981	1.110	0.632	0.178	3.656	0.568	92.876
(LIB)	5	0.184	0.400	2.782	2.334	21.380	2.435	70.485
	10	0.090	1.914	1.989	4.777	26.197	6.106	58.927
	15	0.106	2.974	2.249	5.705	24.899	9.655	54.414
	20	0.334	2.627	5.286	6.430	21.444	11.943	51.934