The Determinants of Islamic Banking Growth in Indonesia

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Abstract

Total assets of Islamic banks in Indonesia contributed to a mere 1.6 % of the total assets of banking system in 2006 and increased marginally to 1.8 % by 2007. Despite the trivial market share, Indonesia’s Central Bank has targeted that the Islamic banks should achieve a 5 % market share by 2008. Accordingly, it is important to identify critical factors for the Islamic banking growth to expedite the industry’s growth. This study examines the determinants and causal relationships among the major determinants of the growth, namely mudharaba investment deposit, interest rate, rate of return, Islamic banks’ branches and income for March 2000 - August 2007 period. It employs time series econometric techniques including VAR model and its associated Impulse Response Function and Variance Decomposition Analysis. Results of this study contribute towards the implementation of more effective initiatives and banking policies to foster the Islamic banking growth in Indonesia.

Keywords: Islamic banking; risk management; banking growth; VAR; generalized impulse response.

JEL classifications: E42, E51, G21

1. Introduction

Islamic banking is a fast growing industry in Indonesia. The industry has a humble beginning with a single Islamic bank in 1992. However, growth and performance of the industry in the past two decades have been remarkable. Total assets of the Islamic banks grew from a mere 479 billion rupiah in 1998 to 30,145 billion rupiah at end of August 2007, recording an impressive compounded growth of more than 50 percent per annum. In terms of banking network, the number of the Islamic banks have increased to three full-fledged Islamic commercial banks, 24 Islamic banking units (window-services offered by the conventional banks), and 544 branches/sub-branch offices. The impressive performance is much attributed to the Indonesian government, primarily through the central bank’s accommodative banking policies. In view of the impressive performance, the central bank has targeted a 5 percent market
share to be achieved by the Islamic banking industry by the end of 2008 (Bank Indonesia, 2006).

Figure 1.1: Islamic Banking Growth in Indonesia (% of total banking asset size)

Despite the remarkable achievement, share of the Islamic banks’ total assets still constitutes a small proportion of the total assets of the Indonesian banking industry. In particular, total assets of the Islamic banks as a percentage of total assets of the banking system comprised of less than 2 % by the end of August 2007 (Figure 1.1). Moreover, increases in the market share in the last few years have been marginal. The incremental market share from 2005-2006 period to 2006-2007 period, for instance, dropped from 0.21 to 0.14 points only. This ‘performance’ is in contrast to the expectation that the Islamic banking industry should achieve a 5 % market in share in 2008. This concern highlights the urgency to identify and evaluate factors critical in accelerating growth of the Islamic banking industry in the country. Understanding the growth determinants would provide important insights in designing relevant and effective banking policies or related initiatives to support long-run growth of the industry.

In view of this, the main objective of this study is to empirically investigate the determinants of Islamic banking growth in Indonesia and evaluate the causal relationships among the growth determinants. In efforts to arrive at conclusive findings, the study employs rigorous investigation techniques by adopting the Impulse Response Functions and Variance Decomposition Analysis based on Vector Autoregressive (VAR) methodology. The study focuses on the period of March 2000 to August 2007.
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The rest of the study is structured as follows. Section 2 reviews the literature on the determinants of banking growth, both from the conventional and Islamic perspectives. Section 3 discusses the methodology adopted in this study as well as the data and model specifications. Section 4 presents and discusses the findings of the study and section 5 concludes.

2. Literature Review
2.1. Determinants of Banking Growth

Banking growth determinants are generally explained in the context of saving and consumption theories. Defining banking growth as the deposit growth, a major indicator of banking growth, requires understanding regarding deposit as a major type of private saving as well as determinants of the private savings behaviors. Literature on the determinants of private savings behavior can be traced back to the early 1930s, when Keynes (1936) proposed the Absolute Income Hypothesis. According to the hypothesis, saving is the excess of income over consumption expenditure, or simply, saving 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.1 The model predicts that consumption in a particular period depends on expectations about lifetime income and, hence, saving behavior will be different across one’s stages of life cycle.

The earlier models have been further refined in recent times and empirically tested worldwide. Many empirical studies have estimated the effects of various economic and demographic variables on private savings rate in cross-country, time series and panel data samples. The literature suggests that there are a number of factors that crucially determine the private saving behavior including income per capita, growth of income per capita, interest rate, inflation rate, terms of trade, government fiscal policy (such as issuance of government bonds and tax regime), financial intermediation factors (such as bank density and provident fund rate), and demographic factors (such as age dependency and urbanization ratio). The significance of each factor, however, differs across group of countries, countries, and time period.

1 Modigliani and Brumberg (1954) also distinguished four main motives for savings, namely to increase the estate of one’s heirs (altruistic behavior), to adjust income to irregular consumption, to meet possible emergencies (i.e., the precautionary motives) and to accumulate assets/equity in order to reduce uncertainty about present and future income (pp. 391-393). However, given the objective to maximize an agent’s lifetime utility, the life-cycle model emphasizes the role of accumulation (of assets) for retirement. They argued that “any one asset in the individual’s ‘portfolio’ may, and usually will, satisfy more than one motive simultaneously” (p.393) and therefore focused on the latest motive in their model.
Masson, Bayoumi, and Samiei (1998) examined the broad-set of possible determinants of private saving behavior in 21 industrial countries and 40 developing countries from 1982 to 1993. The study finds that GDP growth, GDP per capita, real interest rate and terms of trade are positively significant in determining the private saving behavior in the developed countries. This result is confirmed by later studies such as Haque, Pesaran, and Sharma (1999) and Loayza, Schmidt-Hebbel, and Serven (2000). In particular, Loayza et al. (2000) studied 20 industrial countries and 49 developing countries during the 1965-1994 period, incorporating nine determinants of the private saving, namely income, rate of return uncertainty, domestic borrowing constraints, foreign borrowing constraints, financial depth, fiscal policy, pension system, demographics, and income and wealth distribution. The results suggest that private saving rates show inertia, in which the effects of a change in a given saving determinants are fully realized only after a number of years. The level and growth rate of real GDP, inflation, and fiscal policy affect the savings rate positively but with large degree of persistence. On the other hand, dependency ratios and financial liberalization show negative effect on private saving rates. The detrimental effect of the liberalization is evident from the fact that rising credit availability reduces the saving rate, while larger financial depth and higher real interest rate do not raise it.

In addition to the studies above, extensive studies have also been conducted with the focus on the determinants of private savings behavior for a narrow group of countries such as the Asian countries (Lahiri, 1989; Faruqee and Husain, 1995; Horioka, 1997; Agrawal, 2001; and Anoruo, 2001) and individual countries² (Kelley and Williamson, 1968; Qin, 2003; Arthukorala and Sen, 2004; and Shrestha and Chowdhury, 2005). In the context of Indonesia, an earlier study by Kelley and Williamson (1968) applied the life-cycle hypothesis and studied the household saving behavior in the Yogyakarta province from 1958 to 1959. It is found that functional income³ and age structure significantly affect the household saving behavior. The study also noted that developing external financing through a more sophisticated financial structure is necessary to complement internal financing. The last point was later investigated by

² Individual country studies are, in fact, the most popular among others. It has been argued that results of cross-country analysis are rather dubious due to the use of ‘homogeneity’ assumptions in the light of considerable variations among the countries. Accordingly, the differences do not only include the structural and institutional aspects of the economies but also the nature and quality of the economic data. Consequently, careful interpretation of such studies is a must and in-depth time profile analysis of saving in individual countries is necessary to get robust results.

³ Functional income refers to income according to occupation and source of income i.e., internal financing (from own income) and external financing (from other sources such as loans from friends/ banks and debt from capital market).
Chandavarkar (1971), which suggested that increase in bank deposit rates in Indonesia in 1960s (along with increased loan rates) have been accompanied by sharp rises in savings deposit without dampening the business demand for loans.

Other study by Arthukorala and Sen (2004) attempted to analyze the determinants of private saving behavior in India. The econometric evidence points to the statistically significant positive influence of real interest rate, the level and growth of per capita income, spread of banking facilities and the rate of inflation on domestic saving. The incorporation of banking facilities factor marks the role of financial intermediation in determining the saving behavior. In the light of financial intermediation role in influencing the private saving behavior, Shrestha and Chowdhury (2005) investigated the determinants of deposits held at banks for the case of Nepal. By using Autoregressive Distributed Lag (ARDL) model, a long-run relationship between real GDP, real deposit rate and average population density (per bank branch) is found within the 1973-2003 period. In particular, the real interest rate has a significant effect on the real level of deposits in the long-run. Meanwhile, in the short-run, changes in real income and real interest rate are associated with a change in the real savings.

To summarize, these studies have shown that there are several major factors determining private saving behavior, namely income, the level and growth of GDP per capita, interest rate, bank density, terms of trade and demographic factors. Since increased saving simply means deposit growth, it also reflects banking sector growth. In the context of this study, the factors explained above can be considered as the determinants for the growth of the banking institutions.

22. Determinants of Islamic Banking Growth

Similar to the studies on the conventional banks' growth, most studies on Islamic banking growth is also investigated through the saving theory framework. Earlier studies generally discuss the normative aspects of saving behavior in the Islamic framework. The studies have later been extended to include specific factors that could influence the Islamic banking growth. From a micro-perspective, several studies have focused on surveying qualitative aspects of banking selection criteria which directly relate customer preferences towards the Islamic banks. 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 Islamic bank’s growth.

In this context, 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 are attached. A Muslim saves to perform his duties to himself, family, society, and Almighty Allah, which definitely require economic backing. Thus, there is a social welfare dimension to the savings behavior of a Muslim. In fact, as savings are invested, economically rewarding opportunities will increase which is expected to increase the welfare of Muslim ummah. He further argued that the life-cycle hypothesis proposed by Modigliani and Brumberg (1954) is more applicable for the framework of Muslim’s saving behavior. The four motives of saving proposed in the life-cycle model are consistent with Islamic norm behaviors. These motives are evident not only contemporarily, but also during the prophet’s (pbuh) time. A Qur’anic verse, for example, states that a Muslim should “…not spend everything so that you became blameworthy and destitute” (Al-Qur’an 17:29), hence emphasizes the importance of savings.4

The normative aspects are later developed into empirical models. At the micro-level, extensive studies have been conducted to survey the banking selection criteria among customers of the Islamic banks. Researchers find various factors that influence the customer’s choice of Islamic banks such as cost and benefit of product offered (products prices and rate of return of the investment), service quality (fast/efficient banking service and friendliness of the bank’s staff), size and reputation of the bank, convenience (location and ample parking space) and friends/families influences (Erol and El-Bdour, 1989; Erol et al., 1990; Haron et al., 1994; Gerrard and Cunningham, 1997; Nasser et al., 1999; Ahmad and Haron, 2002; and Bank Indonesia, 2005b). Religious and corporate social responsibility issues are also regarded as important consideration in selecting Islamic banking (Haron et al., 1994; Metawa and Almossawi, 1998; Almossawi, 2001; Bank Indonesia, 2005b; and Dusuki and Abdullah, 2007).

In one of the earliest studies on Islamic banking selection criteria, Erol and El-Bdour (1989) discover that the most important consideration in dealing with Islamic banks in Jordan are the provision of fast and efficient services, bank’s reputation and image, and bank confidentiality. Interestingly, they observe that that religious motive is not a primary consideration among the customers to patronize the Islamic banks. The importance of these banks’ attributes is confirmed by the finding of Edris and

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4 Further, many hadiths (the prophet’s wisdom) also suggest the similar motives. For instance, a hadith from Al-Bukhari mentions that “Narrated by Umar: the holy prophet (pbuh) used to sell the dates of the gardens of Bani Nadhir and store for his family so much as would cover their needs for a whole year” (Al-Asqalany, 2003). The hadith clearly shows that saving is particularly important to meet the emergency and future needs, not only for an individual but also for his/her family.
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Almahmeed (1997) for the case of Kuwait. However, recent findings suggest the opposite. Nasser, Jamal and Al-Khatib (1999) report that religiosity and adherence to shari’ah are indeed major reasons in selecting Islamic banks services in Jordan. They also find that other factors such as bank’s reputation, provision of various banking products, confidentiality, location, provision of quality services and profitability motives are equally important for customers in choosing the bank. Similar results are also found in Bahrain, in which bank’s specific factors including image, availability of parking space near the bank, friendliness of bank’s personnel and availability of Automatic Teller Machine (ATM) are found to be significant in determining the preference toward Islamic banks (Metawa and Almossawi, 1998; and Almossawi, 2001).

Several banking selection studies are also conducted for the case of the Asian countries. The selection of Islamic banks in Malaysia appears to be based on a combination of religious motive, financial reputation and quality services offered by the banks (Haron et al., 1994; Ahmad and Haron, 2002). In addition, recent study by Dusuki and Abdullah (2007) point out that good social responsibility practices, location/ convenience, and product prices are also important in patronizing the Islamic banks. In Singapore, the behavior is relatively different due to customers’ segregation into Muslim and non-Muslim group. While the Muslim customers consider religious and quality services as major reasons for choosing Islamic banks, the non-Muslim place high importance for getting more interest payment from the banks in making their decision and choosing an Islamic bank’s services (Gerrard and Cunningham, 1997). Furthermore, in Indonesia, study on potency, preference and people’s behavior towards Islamic banks conducted by Bank Indonesia (2005) finds that the main reason to choose Islamic banks service in the country are religious motive and bank’s location (people’s accessibility to the bank). The study also reveals that return of Islamic banks is not a significant reason in choosing the Islamic bank’s services. 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 interest rate application in the banking system.

Despite their strengths in explaining preference towards Islamic banks, the survey on banking selection criteria explained above have some limitations. The limitation of the banking selection studies is filled by empirical studies on determinants of Islamic

5 The main weakness is that the results tend to be restrictive towards the chosen samples or locations. Most of the surveys have less than 200 respondents. Study by Ahmad and Haron (2002), for instance, is only based on 45 corporate users of financial services. Likewise, although the study by Almossawi (2001) involves 1000 respondents, the survey’s questionnaire was distributed only to college students in Bahrain, thus the interpretation of the results are subject to the respondents’ group only. Consequently, studies that give insights from the macro perspective need to complement the studies above.
banking growth from the macro perspective. Haron and Shanmugam (1995) pioneer the empirical study by investigating Bank Islam Malaysia over the year 1983-1993. Using simple correlation coefficient and autoregressive models to examine the relationship between the rates of return offered by Bank Islam Malaysia and the level of deposit in the bank, the study finds that there is an inverse relationship between the variables. This implies that the Islamic bank customers did not consider returns from the Islamic deposit as an incentive to maintain funds with the bank. However, as this result is contrary to the normal behavior of investors, Haron and Ahmad (2000) expand the study to include all funds deposited in Islamic banks in Malaysia from January 1994 to December 1998. The results indicate that the rates of profit have strong positive relationship with Islamic banks’ deposits, while the interest rates have strong negative relationship with it. Therefore, it is suggested that Islamic banks’ customers in Malaysia are attracted to higher return and guided by the profit motive. A more recent study by Sukmana and Yusof (2005) which employs a wider data set (January 1994 to October 2004) also confirms the previous conclusion.

Mangkuto (2004) applied similar study for the case of Bank Muamalat Indonesia. The study examines the effect of mudharaba deposit yield in the bank and interest rate in the conventional bank on level of the Islamic deposit. 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. Scope of the study is later widened by Rohmah (2006) to cover all Islamic banks in Indonesia from March 2000 to February 2006. Using Autoregressive Distributive Lag (ARDL) model, it is shown that the mudharaba 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.

Overall, the empirical evidences discussed above suggest that the determinants of saving and the preference towards Islamic bank is affected not only by the returns of the Islamic banks and interest rate of the conventional counterpart but also by macroeconomic variables such as income as well as banking policies/banking specific features such as location and number of Islamic banks’ branch.

3. Methodology and Data
Time series econometric techniques of co-integration, Vector Autoregressive (VAR), Impulse Response Functions (IRF), and Variance Decomposition (VDC) analysis are employed to examine the dynamic interactions among the variables of interest. Following a standard time series econometric technique, the investigation steps are as
follows: (i) unit root and co-integration tests; (ii) VAR specification and estimation; and (iii) IRF and VDC analysis. Unit root and co-integration tests entail preliminary analyses of data series for proper specification of the VAR models. Meanwhile, IRF and VDC analysis capture the estimation results of the VAR in order to estimate relative strength of the variables of interest to shocks in other variables.

3.1. Unit Root and Co-integration Tests

Time series analysis requires stationary data. Stationarity is a condition of time series which has constant mean and variance distribution overtime (Gujarati, 2003). Regressing non-stationary time series may lead to spurious regression, in which a model has high $R^2$ but there is no meaningful relationship between the variables. This produces bias and erroneous conclusion. Therefore, to avoid the problems, we employ the commonly used Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The finding of stationary series allows us to proceed to the next test.

To test for co-integration and existence of long-run equilibrium, we employ a VAR-based procedure of Johansen and Juselius (1990). The Johansen-Juselius co-integration test is conducted on a typical VAR model as follow:

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

where $X_t$ is a vector of non-stationary variables integrated of the same order, $\mu$ is a vector of intercept, $\Pi_k$ is a matrix of coefficients and $e_t$ is a vector of error term.

Under the co-integration test, the number of co-integrating vectors is determined using the Trace Statistics (TS) and the Maximum Eigenvalue (ME) statistics. By comparing the TS and ME statistics values with their respective t-statistic values, conclusion can be made as to whether the variables are cointegrated or not. If the TS and ME values exceed the t-statistics, the null hypothesis of no co-integration ($r = 0$) is rejected and it can be concluded that there exists long-run relationship among variables in the vector. Additionally, since result of the co-integration test tends to be sensitive to the order of the VAR model, the proper choice of lag length for the VAR is also critical. The lag length can be determined by using various information criteria. In this study, the lag length is determined based on Schwarz Criteria (SC) which is commonly used for the VAR model.

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6 The common criteria are Akaike Information Criterion (AIC) and Schwarz Criterion (SC). However, most of the time the information criteria produced consistent lag order selection in VAR model (Lutkepohl, 1991). For more discussion please also see Grasa, 1989.
3.2. Vector Autoregressive, Impulse Response Functions and Variance Decomposition Analysis

In the past, most macroeconomic studies are conducted using structural models. In these models, some variables are treated as endogenous and some as exogenous or predetermined variables (exogenous plus lagged endogenous). Thus, before estimating the model, assumptions must be made regarding treatment to the variables. Sims (1980) criticized that this decision is often subjective and argued that all variables in a system should be treated as endogenous variables. It is further suggested that working with a Vector Autoregressive (VAR) model is better than working with the structural model. A representative of a VAR model is given in equation (1).

Traditionally, studies adopting the VAR model employ variables in log level (see, for example, Sims 1980 and 1986). The problem is that the result from such a specification may be spurious and misleading if log level variables are non-stationary. Thus, integration and co-integration tests previously discussed are necessary to avoid spurious regression and misspecification problems. In particular, the findings that the variables are non stationary and are not co-integrated suggest the use of VAR model in first difference. However, if they are co-integrated, a Vector Error Correction Model (VECM) needs to be used (Engle and Granger, 1987). Since the VECM can be re-parameterized to form an equivalent VAR model in level form, the level VAR can also be used (Masih and Masih, 1997; Ibrahim, 2006). Moreover, using the VAR in level has several advantages to deal with dynamic behavior. The most notable argument in favour of it is the low computational burden and the rich economic interpretation attached to the associated impulse-response functions. While the impulse-responses from the VECM tend to imply that the impacts of certain shocks are permanent, those from the level VAR allow history to decide whether the effects of shocks are permanent or not (Ramaswamy and Sloek, 1997; Ibrahim, 2006; Kassim et al., 2007a).

An impulse response function (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 IRF is simulated from the estimated VAR. The generation of IRF is that innovations in VAR equations may be contemporaneously correlated. This means that a shock in one variable may work through the contemporaneous correlation with innovations in other variables and isolated shocks to individual variable may not be adequately represented. To solve the issue, it is common to orthogonalizing the innovations using the Cholesky decomposition (Sims, 1980). However, result from the approach is found to be sensitive to the ordering of the variables. Therefore, Pesaran and Shin (1998) developed generalized impulse
response functions to circumvent the ordering problem inherent in the orthogonalized model.

Variance Decomposition Analysis (VDA), on the other hand, is a fraction of forecast error variance of a variable attributed to shocks in other variable particularly to inference of relative strength of innovations in the variable of interest. Although it basically provides similar information with the IRF, 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 arising from changes in the same variable and in other variables during previous period. A variable that is optimally forecast from its own lagged values will have all its forecast error variance accounted for by its own disturbances. This information is conveniently presented by the VDA (Masih and Masih, 1997).

3.3. Data and Variables

Previous studies suggest that the Islamic banks behaviors’ and growth are mainly influenced by the return of Islamic deposits, interest rate of conventional bank’s deposit, macroeconomic factors such as income and inflation, and banking-specific factors such as bank location. Accordingly, this study estimates a five-variable VAR model using real mudharaba investment deposit, real interest rate, real rate of return, number of Islamic banks’ branch and real income as the variables in the system. Specifically, the study focuses on the following basic system:

\[ \text{LNRDEP} = f \{ \text{LNRDEP, RR1, RI, LNBRANCH, LNIPI} \} \] (2)

where LNRDEP is the real level of mudharaba-investment deposit in Islamic banks (in log form), RR1 is the real rate of return for 1-month mudharaba-investment deposit in Islamic banks (lag 1 month), RI is the real interest rate for 1-month time deposit in conventional banks, LNBRANCH is the number of Islamic banks’ branches (in log form), and LNIPI is the industrial production index (in log form).

The real level of Islamic banks deposit, the first variable, is measured by the total of mudharaba investment deposits in the Islamic banks including the 1, 3, 6, and 12 months investment deposits in rupiah, adjusted to the Consumer Price Index (2002=100). The deposit is the main type of Islamic deposit which captures more than 50 % of the total deposits of the Islamic banks. The deposit is expected to be influenced by all other variables in the VAR systems. The real rate of return for 1-month mudharaba investment deposit (lag 1 month\(^7\)) in rupiah is used as the proxy

\(^7\) It is important to note that, instead of using the current real return, the one-month lag of Islamic banks return is used to reflect the prohibition of predetermined return paid to its depositors upon the deposit. Thus, since rate of return on the deposit is usually declared at
for the return to the total *mudharaba* investment deposit in Islamic banks, net of inflation effect. The relation between the rate of return and the level of Islamic deposit is estimated to be positive. Higher rate of return in the previous month is expected to be able to keep the existing depositors and attract new depositors, which in turn increase the deposit level. Furthermore, the real interest rate for 1-month time deposit is employed as the conventional interest rate proxy. The relationship between the interest rate and the level of *mudharaba* deposit is estimated to be negative. Higher interest rate paid by the conventional banks could potentially attract the Islamic banks’ investment account holders to transfer their funds to the conventional banks and decrease the deposit level in the Islamic banks.

Industrial Production Index (2000 = 100) is employed as the proxy to income, a major macroeconomic indicator potentially affecting Islamic banking growth. The index is commonly used as proxy for economic activity or national income primarily due to the unavailability of real GDP or GNP measures on a monthly basis (Rohmah, 2006; Kassim et al., 2007a; Kassim et al., 2007b). The relationship between the variables is expected to be positive. Finally, the number of Islamic banks’ branches is used as a proxy for bank’s location (people’s accessibility to Islamic banks). The number of Islamic banks’ branches is defined as the sum of branch offices, sub-branch offices, shari’ah services unit, and cash offices of the Islamic banks. It is expected that the increase of Islamic banks’ branches will increase the level of the Islamic deposit.

Banking data are obtained from various publications of the Indonesian central bank which cover all banks in Indonesia. As of August 2007, there are 130 conventional commercial banks, three Islamic commercial banks, and 24 Islamic Banking Units (of the conventional banks) in Indonesia. Macroeconomics data, including industrial production index and inflation data, are obtained from the National Statistical Bureau of Indonesia. The study covers the period from March 2000 to August 2007.

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8 The 1-month mudharaba-investment deposit is chosen as it represents more than 50 per cent of the mudharaba-investment deposit of the Islamic banks.

9 This type of deposit is the main type of time deposit which captures around 70 per cent of the total time deposit in the Indonesian banking system.

10 Shari’ah Services Unit is a special unit in the head office which functions as the head office of the branch offices, sub-branch offices and or shariah unit. Shari’ah unit itself is a special unit in the branch or sub-branch offices whose activities are to mobilize funds, channel funds, and provide other banking services based on shari’ah principle in their preparation to be shari’ah branch office (Bank Indonesia Regulation PBI No. 8/3/PBI/2006).

11 Cash Office is an office below Branch Office whose business operations assist its parent Branch Office except in channeling of Funds (Bank Indonesia, 2006).
4. Results and Discussion

4.1. Unit Root Tests and Johansen Co-integration Test Results

The unit root tests are conducted to check the stationarity property of the series. Prior to the tests, deterministic trend and constant in the data are evaluated and included where relevant. Table 4.1 depicts the results of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests for each variable. The associated ADF test indicates non-stationarity in levels but stationarity in first differences for all variables. These results are confirmed by the PP tests’ results. Therefore, it can be concluded that these variables are integrated of order 1, i.e., $I(1)$ is observed in the series. Overall, it suggests the possibility of long-run relationship among the variables.

Table 4.1: Results of Unit Root Tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF Test</th>
<th>PP Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At level</td>
<td>First difference</td>
</tr>
<tr>
<td>LNRDEP</td>
<td>-0.668</td>
<td>-8.207**</td>
</tr>
<tr>
<td>LNBRANCH</td>
<td>-0.377</td>
<td>-10.192**</td>
</tr>
<tr>
<td>LNIPI</td>
<td>-0.551</td>
<td>-15.022**</td>
</tr>
<tr>
<td>RI</td>
<td>-1.123</td>
<td>-3.283**</td>
</tr>
</tbody>
</table>

Notes: The test statistics are compared to the critical values from MacKinnon (1996). ** and * indicate significance at 1% and 5%, respectively.

Given the above observations, the study proceeds and formally tests the existence of the long-run relationship between the variables by using the Johansen-Juselius (1990) co-integration procedures. Since the co-integration test is sensitive to the lag structure of VAR model, optimal lag length needs to be determined before conducting the test. Based on the Schwarz Criterion (SC) test, lag 1 is suggested as the optimal lag length. Results of the co-integration test are presented in Table 4.2. The trace statistics and the max-eigen statistics suggest the presence of two unique co-integrating vectors among the variables of interest. Thus, following Granger (1988), it can be concluded that the variables have a long-run equilibrium and hence causality relationship exists in at least one direction in the system.

Table 4.2: Results of the Johansen Co-integration Test

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test Statistics</th>
<th>Critical Values (5 %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trace</td>
<td>Max-Eigen</td>
</tr>
<tr>
<td>r = 0</td>
<td>118.810**</td>
<td>42.565*</td>
</tr>
<tr>
<td>r ≤ 1</td>
<td>76.244**</td>
<td>38.240**</td>
</tr>
<tr>
<td>r ≤ 2</td>
<td>38.005</td>
<td>17.636</td>
</tr>
<tr>
<td>r ≤ 3</td>
<td>20.370</td>
<td>14.271</td>
</tr>
<tr>
<td>r ≤ 4</td>
<td>6.098</td>
<td>6.098</td>
</tr>
</tbody>
</table>

Notes: The test statistics are compared to the critical values from MacKinnon-Haug-Michelis (1999). ** and * indicate significance at 1% and 5%, respectively.
4.2. Impulse Response Function Results

The existence of co-integration among the variables allows the estimation of the VAR model in level form. As before, the lag length of the VAR model is set to 1. The generalized IRF captures the dynamic responses of a variable of interest to innovations in the variable itself and in other variables, hence enables the analysis of the dynamic interactions among determinants of Islamic banking long-run growth in Indonesia. The IRF results are shown in Figures 4.1 and 4.2. In all cases, the results are reported over a 24-month horizon in order to analyze the persistence of the shocks. Following Sims and Zha (1995), these plots are given together with two standard deviation bands in order to provide some idea of uncertainty surrounding the estimated response. Generally, if the zero line is not within the bands, then the responses are significantly different from zero. Thus, responses must be inside the bands to be statistically significant.

Figure 4.1: Generalized Responses of Real Mudharaba Investment Deposit

Figure 4.1 shows the generalized responses of real mudharaba investment deposit to shocks of the other variables. The Islamic deposit, real rate of return, and real interest rate are found to be significantly affecting the Islamic deposit level in the long-run, yet with different magnitude and time profile. While the Islamic deposit responds positively and immediately to innovations in itself and its real rate of return, it responds negatively to shocks in the real interest rate after some lags. The positive response of the mudharaba deposit occurs immediately after the real return shocks and lasts for approximately 14 months. This implies that in the long-run depositors of Islamic banks are rational depositors whose saving behavior is driven by higher real return, which concurs well with the results of Haron and Ahmad (2000), Mangkuto (2004) and Rohmah (2006). However, this finding is contrary to the results obtained by the survey of Bank Indonesia (2005b) in South Kalimantan, South Sumatera, North Sumatera, and West Java provinces which suggest that the rate of return is not
a significant factor in determining depositors’ decision to choose Islamic banks. \textsuperscript{12} The conflicting results could be due to the different methodology and shorter study period adopted by the study. \textsuperscript{13} Additionally, the contrary results were not found in other provinces where the surveys were also conducted. Therefore, it can be concluded that higher rate of return encourage more savings in the Islamic bank or, simply, the depositors are driven by profit motive in their savings behavior.

As expected, shocks in real interest rate of conventional banks affect the \textit{mudharaba} deposit negatively and after some lags. The effect lasts for about 11 months, starting approximately from the third until the 14\textsuperscript{th} month, implying that rising real interest rate leads to temporarily lower amount of the Islamic deposit. The result is consistent with Gerrard and Cunningham (1997), Haron and Ahmad (2000), Mangkuto (2004), Sukmana and Yusof (2005), Rohmah (2006), and Kassim et al. (2007a) and supports the previous finding regarding the rational behavior of the Islamic banks’ depositors. This result is also confirmed by the finding of Bank Indonesia (2005a) which reported that in the third quarter of 2005, when the real interest rate exceeded the real return by close to 2.5\% , the growth of Islamic deposit was only 0.4 billion rupiah (quarter-on-quarter) due to significant withdrawal and transfer of funds, especially from ‘large’ depositors (i.e., corporations and individual investors with large denomination of funds), from the Islamic banks to the conventional banks. While it was also evident that the funds were ‘returned’ to the Islamic banks in the following quarters, where gap of the rates decreased, it came at the expense of lower growth of Islamic banks’ profit due to higher re-allocation of some operational income to the profit sharing margin in effort to retain the Islamic banks’ competitiveness (Bank Indonesia, 2006a).

The study also finds that although the response of Islamic deposit to shocks in the number of the Islamic bank branch appears to be positive, it is not significant over the long-run. In other words, given the historical condition during the period of observation, the innovations in Islamic banks’ branch do not give significant impact on the Islamic banking growth. While this finding seems to be in contrary to the results of previous studies in several countries (Nasser et al., 1999; Rohmah, 2006; and Dusuki and Abdullah, 2007), it may not necessarily be the case when the Islamic

\begin{footnotesize}
\begin{enumerate}
\item Only 0.3\% (West Java), 0.6\% (South Kalimantan and North Sumatera), and 6.6\% in South Sumatera from total respondents that considered the rate of return is an important factor in choosing Islamic banks (Bank Indonesia, 2005b).
\item The Bank Indonesia study used qualitative methodology based on sampling method and questionnaires which are subjected to many control variables such as the amount of Islamic deposits, occupation, and location of residences.
\end{enumerate}
\end{footnotesize}
banking development in Indonesia, especially regarding the recent banking policy changes and issues in its implementation, is carefully observed.

Although in the last seven years there has been an exponential rise in number of Islamic bank’s branch from 42 units to 544 units (Bank Indonesia, 2007), it is believed that significant improvement actually occurred after the central bank issued the *shari’ah* office channeling regulation on 30 January 2006 through its regulation PBI 8/3/PBI/2006. The new regulation provides more support to expand Islamic banking networks by allowing the conversion of conventional commercial banks’ business to *shari’ah*-based business, permitting the conventional banks to establish bank offices that conduct businesses based on *shari’ah* principles, and cutting the licensing process from 2 stages to 1 stage only (Bank Indonesia, 2006b). Nevertheless, as the policy is just recently issued and being implemented for about 18 months only (February 2006 – August 2007)\(^{14}\), in the context of this study, it is reasonable to expect that the impact on the long-run development of Islamic banking in Indonesia is not fully realized. It is noticeable, for instance, that growth of the Islamic banks’ branches increased sharply from an average of 0.26 % annually (February 2005 – January 2006) to an average of 1.96 % annually (February 2006 – January 2007), or approximately three additional new offices are being established every month after the new regulation is imposed. In terms of deposit mobilization, however, the resulting change was relatively insignificant. The annual growth of *mudharaba* investment deposit slightly increased from 29.83 % to 30.85 % in the same period, suggesting that the new branches were not optimal yet in mobilizing more funds in a short period of time.\(^{15}\)

Based on the findings, it is believed that the insignificance of the branch variable (proxy for the Islamic banking policy in this study) is mainly due to the timing problem, that is due to the fact that the supportive branch policy is relatively new and its implementations would involve considerable time lag to be effective. This is in line with Loayza et al. (2000) which suggest that private saving behaviors usually show inertia, in which the effects of a change in a given saving determinants are fully realized only after a number of period. However, as shown in Figure 4.1, the branch number has indeed contributed to a positive trend toward higher Islamic banking

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\(^{14}\) Note also that this observation period (February 2006 – August 2007) is not captured by the study of Rohmah (2006), which is the only Indonesian case study that includes the Islamic banks branch in the analysis.

\(^{15}\) It is also possible that the new Islamic banks’ branches were established by small Islamic/conventional banks, thus significant increase of the Islamic deposit did not happen. However, investigation of this matter is quite difficult since the available statistical publications do not include such details in their reports.
growth and indicated a possible permanent effect on the growth in the long-run. Hence, it can be inferred that the current Islamic banking policy of encouraging Islamic banks to expand their networks moves in a **right direction** to expedite the Islamic banking growth in Indonesia. Continuous support on the policy is expected to give positive and permanent impact on the growth in the future.

The result also shows that even though the Islamic deposit responds positively to innovations in real income, the response is insignificant. While this result is not in line with the previous studies on Indonesia (Kelley and Williamson, 1968; Agrawal, 2001; and Rohmah, 2006), it is actually quite intuitive considering the small size of Islamic banks as compared to the conventional banks in Indonesia. As of August 2007, the total assets and total deposits of Islamic banks were only 1.66% and 1.67% of the national banks’ share, respectively (Bank Indonesia, 2007). Therefore, it is unlikely that such condition can significantly contribute to long-run income and economic growth of the country. Yet, this finding indicates that positive economic growth is important in order to support Islamic banking growth in Indonesia.

Figure 4.2: Selected Generalized Responses

Other noticeable findings based on the generalized responses which also show the dynamic inside the system are presented in Figure 4.2. The figure shows that the real return of Islamic deposit responds positively and significantly to shocks in real interest rate and in real *mudharaba* investment deposit. Interestingly, innovations in real return also influence real interest rate in the opposite directions such that positive innovations in the real return are immediately followed by lower real interest rate for approximately 10 months. Together with the significant response of the real return to shocks in the real interest rate, this result confirms the co-movement between the two rates in the long-run. The difference, however, can be seen from the pattern and duration of the effect. While shocks in the real return influence the real interest rate immediately, the reverse only occurs after some time lags. Moreover, real interest rate changes affect real return considerably longer, that is approximately two times longer than the opposite case. This is somewhat indicating that the real interest rate is used
as a benchmark for the rate of return of the Islamic deposit in the long-run. The use of interest rate as a benchmark for the rate of return and pricing for other Islamic financial products, however, remains the subject of hot debate among shariah scholars worldwide. While the debate is necessary to strengthen the Islamic banking institutions, the long-standing and unresolved debate has, to some extents, created confusion among the ummah and prevents some potential consumers to deal with Islamic banks. These could in turn hinder the growth of Islamic banks.

Positive shocks in the mudharaba investment deposit immediately affects the real return in the same direction and diminishes after a considerable time period i.e. approximately 13 months. Since the previous finding (see Figure 4.1) shows that shocks in the real return also affect the mudharaba deposit positively, this result implies that a bi-directional relationship exists between the Islamic deposit and its real return in the long-run. The bi-directional relationship between the Islamic deposit and real return can be explained as follow. Higher real return increases the amount of Islamic deposits through the influence of the profit-seeking motive, while higher deposit increases the capability of Islamic banks to ‘adjust’ the rate of return to be as ‘competitive’ as the real interest rate, which in turn could encourage increase the level of mudharaba investment deposit. The additional amount of the Islamic deposit could come from the existing depositors and or the new depositors who are attracted by the ‘competitive’ return. Note that if the banks are ‘forced’ to give part of their profit share to fulfill the expectation of the consumers and stay competitive in the market, this could suggest a poor risk management practices which increase their operational expenses and reduces their profit margin. In the long-run, these exercises could potentially limit, or even deteriorate, growth of the Islamic banks in Indonesia.

4.3. Variance Decomposition Analysis Results
The variance decomposition (VDC) analysis provides literal breakdowns 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 determines the Islamic banking growth in Indonesia in explaining variations in the 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: LNMPI,
 LNBRANCH, LNRDEP, RR1, and R1.\textsuperscript{18} Results of the VDC method are presented in Table 4.3. Similar to the IRF results, they are presented for a 24-month horizon. In general, results of the VDC further substantiate the earlier findings based on the IRFs. In case of the mudharaba investment deposit, variations in the other variables contribute to approximately 62.6\% of the variations in the deposit, indicating that the Islamic deposit is a highly endogenous variable which is sensitive to variations in the other variables. Specifically, real return and real interest rate of conventional banks explain 39.88\% and 6.88\% of the Islamic deposit forecast error, respectively. Accordingly, the variations of both rates are the most important variable in explaining the fluctuations of the mudharaba investment deposit. This is in line with the previous results based on the IRF method, which suggesting that the real return and the real interest rate are the most significant variables that influence the Islamic banking growth in the long-run.

Other endogenous variables suggested by the results of VDC analysis are real interest rate and real rate of return. Approximately 66.46\% variations of the real interest rate are explained by variations of the other variables, while 61.22\% variations of real return are attributable to variations of the others. Interestingly, the VDC result for real interest rate also indicates that variations in the real return are the most important factor affecting the variation of the real rate. Variations of real return contribute to 46.35\% of the real interest rates’ fluctuation, while variation of the variable itself only accounts for 33.54\% of the total variations. On the other hand, variations of real return are mainly explained by its own variance rather than that of the real interest rate. Approximately 38.78\% of the real return variance is attributable to its own variance, while 24.92\% and 17.73\% of the variance is attributable to Islamic banks’ branch and real interest rate variance. Finally, the analysis also suggests that Islamic banks’ branch and real income are relatively exogenous due to the small effects of other variables’ variances to their fluctuations.

The vulnerability of Islamic deposit to variations in real interest rate and real return suggest that any changes in the rates will significantly affect the Islamic banking performance, in this case its deposit mobilization, and subsequently the Islamic banking growth. Consequently, among others, the stability and growth of Islamic banking system is highly dependent on the stability of conventional banking system, which is well-reflected by the variability of its interest rates. It is plausible that the Islamic banking system will never be free from any shocks in the counterpart’s system, as real interest rate is also found to be the most endogenous variable which is very responsive to variations of the other variables. This is in line with Kassim et al.\textsuperscript{19} Invariant to variable ordering, the VDC results are sensitive to ordering of the variables. For more discussion please refer to Lutkepohl (1991).

\textsuperscript{18} Several alternative ordering of the variables have been tried, but they do not alter the results substantially.
(2007b) which found that the fluctuation of Islamic bank deposit in Malaysia is primarily explained by variation of overnight interest rates, which enables arbitrage opportunities especially by the conventional bank’s market player and exposes the Islamic banking system to systemic instability. This indicates that performance and growth of the Islamic banks is interdependent with that of the conventional banks.

Table 4.3: Results of the Variance Decompositions Analysis

<table>
<thead>
<tr>
<th>Variance Decomposition of</th>
<th>Period</th>
<th>Innovations in</th>
<th>LNRDEP</th>
<th>RR1</th>
<th>RI</th>
<th>LNBRANCH</th>
<th>LNIPI</th>
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<td>0.000</td>
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</table>

5. Concluding Remarks

This study provides empirical evidence regarding the determinants of Islamic banking growth in Indonesia during the March 2000-August 2007 period. Results of the study suggest that the Islamic banking growth is significantly determined by the dynamics of real rate of return and real interest rate. Higher rate of return increases the industry’s growth, while higher interest rate hinders its growth. It is also evident that movements of the real rate of return and real interest rate are interdependent, thus
creating a potential systemic instability in the Indonesian dual banking system. Furthermore, given the historical development of Islamic banking in Indonesia, the existing banking policies do not seem to have significant impact on the industry’s growth. It is believed that the insignificance of the policies mainly happens due to the time-lag problems, that is time lag between the policies socialization and its effective implementation. However, as the finding also shows positive and increasingly significant trend of the policies impact to the Islamic banking growth, the expected impacts could probably occur in the near future.

Based on these results, it can be highlighted that the current bank networking and risk management regulations, especially in managing the fluctuations in interest rate and rate of return, seem to be insufficient in accelerating growth of the Islamic banking in Indonesia. The fact that market share of the Islamic banking industry still account for less than 2 % of the total banks in Indonesia also gives a clear indication that the authority must go beyond the existing policies, scrutinizes other factors that may encourage or discourage the growth of Islamic banking industry and further develop the relevant policies. These issues should be of concern, primarily by the authority and Islamic banks players, provided that the government wants to achieve the 5 % targeted market share by end of 2008.

Finally, it is believed that the Islamic banking institution needs to be strengthened by improving the implementation of current Islamic banking initiatives and introducing new initiatives or policies that support the development of the industry. Some aspects that need to be seriously considered in the future include risk management framework for Islamic banks in Indonesia, public education, variety of products and services, strategic partnerships with relevant parties, supportive legal infrastructure, and ample pool of human resources. Together, all these initiatives are expected to contribute towards accelerating the Islamic banking growth as well as developing a sound Islamic banking system and achieving Islamic financial stability in Indonesia.

**Bibliography**


