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Does Islamic banks' securitization involvement restrain their financing activity?

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Abstract

Purpose – The purpose of this paper is to validate the concern that banks' increasing involvement in securitization activity restrains banks' lending, as well as their degree of risk tolerance. Theoretical frameworks claim that securitization reduces risk, hence decreasing banks' degree of risk aversion. Subsequently, banks would be motivated to increase their percentage of assets devoted to risky activities, which is lending to economic sectors. However, banking statistics dictates that banks' lending is on the decline while banks' securitization activities are on the rise.

Design/methodology/approach – The paper refers specifically to the Malaysian Islamic commercial banks and utilizes standard panel data analysis.

Findings – Supportive evidence was found that banks' involvement in securitization activity do restrain their lending activity. In addition, banks tend to have a riskier portfolio composition following their involvement in securitization activity. Taken together, this signals that banks' involvement in securitization activity needs to be regulated or restricted since excessive securitization activities could curtail credit and increase risk inherent in banks' lending portfolio.

Originality/value – This study departs from previous literature in the sense that an alternative method is introduced to measure banks' securitization activity.

Keywords Islam, Securities, Banks, Loans, Investment appraisal, Malaysia

Paper type Research paper

Introduction

This study is an empirical exploration of how Islamic banks' involvement in securitization activity affects their financing activity. In particular, this study attempts to investigate whether securitization complementarily encourages Islamic banks' financing activity or does it curtail banks' willingness to extend financing. Then, an exposition of the impact of securitization on Islamic banks' financing profile will be addressed in the subsequent part of this study.

Theoretical models of financial innovations for conventional banks have successfully illustrated how securitization would complementarily increase bank on-balance sheet lending[1]. Among those who advance such models are Diamond (1984) and Santomero and Trester (1998). In these models, securitization apparently reduces risk but consequently, it leads to a decline in banks' degree of risk aversion. Hence, it is more attractive for banks to acquire more risk by undertaking greater investment in risky activities such as increasing their lending, particularly to more risky sector.

However, development in the financial world since the 1980s indicates the contrary. Banks are aggressively restructuring their activity by concentrating more on securitization rather than specializing on their traditional role of deposit takings and extending loans (see, e.g. Allen and Santomero, 2001; Schmidt *et al.*, 1999). The

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increased competition in banking products following financial deregulation, more stringent capital requirement as well as the advances in information technology which negated banks' traditional comparative advantage, dictate that it is no longer optimal for value-maximizing banks to specialize on their traditional role. With all these changes have come assertions that banks are shifting their activity away from making loans to securitization.

Motivation for this study lies in the possibility that securitization adversely affects banks' willingness to extent financing, thus the availability of financing in the economy. Our concern for this is related to the fact that banks' financing activity is central to the lending channel of monetary transmission mechanism. Hence, banks claim a special role in terms of aggregate credit allocation. According to the credit view of monetary transmission mechanism, there is an important link between the allocation of credit through bank loans and the performance of the economy as a whole, (Berger and Udell, 1994). Thus, a contraction in loan supply or a decrease in banks' willingness to extend credit might register a negative impact on the economy as a whole through lending channels, especially to economies where credit lending channels serve as an important transmission mechanism.

In examining the relationship between financing and securitization, we adopt a broad definition of securitization. By the broad definition, the term securitization includes any transaction under which a securitization vehicle directly or indirectly acquires receivables or bears risk associated with commitments taken or activities carried out by third parties and issues in exchange securities whose return is directly linked to the risks borne. Therefore, securitization describes a broad range of disintermediating and off-balance sheet activities of banks including issuing standby letter of credit, extending loan commitments, selling loans with and without recourse and manipulating derivatives instruments. This is also consistent with previous researches, such as Greenbaum and Thakor (1987), Benveniste and Berger (1987), Berger and Udell (1993), Stanton (1998) and Moleyneux and Shamroukh (1999) which use the term securitization to represent the respective securitization instruments. Given that banks are increasingly concentrating on off-balance sheet activities, we argue that it is necessary to employ the broad definition of securitization to get a better indication on how securitization activity is affecting the availability of credit in the economy.

Hence, this study differs from previous work on securitization and financing, in the sense that it includes banks' securitization portfolio, instead of focusing only on specific securitization instruments. Following that, this study is structured to include a more comprehensive securitization items. Our contribution is the introduction of an alternative securitization indicator, which explicitly takes into account both volume and variety aspects of securitization, in its construction. Using that new indicator, this study attempts to enrich the literature by providing additional empirical evidence on the impact of securitization on Islamic banks' financing portfolio as well as their risk profile.

In addition, contrary to previous study that focuses only on total on-balance sheet lending, this study is equally interested to examine whether the impact of securitization is asymmetric across the three broad lending sectors, namely real estate loan, commercial and industrial loans as well as consumer loans. The risk associated with each category differs and since securitization essentially is pursued to better manage risk, it is of interest to observe whether securitization affects financing to each sector differently.

Utilizing the Malaysian Islamic banks data from 1994-2004, our findings provide evidence that involvement in securitization activity adversely affects an Islamic bank's financing activity after controlling for bank capital and economic condition, which may affect financing demand. Contrary to Santomero and Trester (1998) hypothesis, involvement in securitization activity does not encourage banks to increase the percentage of their portfolio in lending activity. Therefore, we do not observe any enhancement in their role of providing credit to the economy.

The results of the impact of securitization on individual financing sectors lend support to the moral hazard hypothesis. Islamic banks choose to reduce its safest loans category, which is consumer financing substantially following their involvement in securitization activity, while the reduction of real estate financing is relatively modest. This illustrates that Islamic banks tend to concentrate their financing on high risk-high return financing in their financing portfolio following securitization activity.

The remainder of the paper is organized as follows. Section 2 reviews previous work relating to securitization and bank lending activity. Section 3 presents model specification and data description. Empirical results are documented in Section 4 and section 5 concludes.

Prior studies

Our study builds on the significant literature examining securitization and bank lending. These studies include those that examine securitization and the optimal amount of total lending and those that examine securitization and the risk profile of lending portfolio, either theoretically or empirically.

In general, available theoretical frameworks advocate that securitization complementarily increases banks' willingness to lend. Diamond (1984) and Santomero and Trester (1998) produce theoretical models that explain the complementarities between banks' securitization involvement and their lending activity. Both models rely on asymmetric information problems underlying the credit markets in explaining why securitization involvement and bank lending might be complementary activities.

Diamond (1984) and Santomero and Trester (1998) are among theoretical models that explain the complementarities between banks' securitization involvement and their bank lending. Both models rely on asymmetric information problems underlying the credit markets in explaining why securitization involvement and bank lending might be complementary activity. According to Diamond's model, banks intermediates by accepting deposits from depositors and channel them as loan contracts to entrepreneurs. Depositors delegate the responsibility of monitoring loan contracts to banks due to their ability to economize the costs of monitoring. However, delegation of monitoring duties results in an incentive problem referred to as "delegation costs". Banks can reduce these delegation costs through diversification of their assets. However, even after diversifying, banks still face systematic risks. It is the presence of systematic risks in these loan contracts that implies the usefulness of derivatives as a third form of contracting. Diamond demonstrates how derivative activity allows banks to reduce their exposure to systematic risk in their portfolio. Hence, the usage of derivative enables banks to obtain further reductions in delegation costs and in turn, increases banks degree of risk tolerance in their lending activity. Therefore, securitization enables banks to intermediate more effectively. Thus, Diamond's (1984) model predicts that derivative activity will be a complement to lending activity.

While Diamond's model focuses on derivatives contracts, Santomero and Trester's model refers to financial innovations that minimizes asymmetric information

problems, increasing banks' asset liquidity, decreasing illiquidity risk, hence encourages banks to extend more loans. Following Akerlof (1970), they claim that banks' assets are illiquid due to information problem. Loan sales and securitization create the need for rating agencies to give credible information on the quality of banks' assets. Hence, they decrease the cost of informing potential investors the quality of assets. This environment increases the ease in which assets created by the banking sector can be sold to other investors. Thus, it decreases the impact of panic shocks or liquidity shocks as these liquidity needs are more easily accommodated by the sale of assets. Therefore, it encourages the institution to increase the percentage of its portfolio devoted to loan, which is considered risky and illiquid. As a result, securitization could exert a positive impact on bank lending activity.

Collectively, these two models imply that banks' securitization involvement would unambiguously enhance banks' willingness to increase their lending activity. From a macroeconomic point of view, this could facilitate banks to better perform its function of credit provision; hence securitization may increase the availability of credit in the economy. Available empirical studies on securitization and bank lending, support the above hypothesis. Among others, Strahan and Cebenoyan (2004), and Brewer *et al.* (2000) produce supportive evidence that active participation in securitization increase lending. Somehow, an important caveat applies here; securitization should be adopted as risk management tools, rather than on capital arbitrage basis.

The possibility of securitization being adopted on capital arbitrage basis is a concern arises following the implementation of minimum capital requirement. Jones (2000) illustrates how securitization could adversely affected lending if utilized as a capital arbitrage tool. Given the gap between economic risk and regulatory risk measurement inherent in the current Accord, banks are motivated to shift their portfolio away from on balance sheet lending to off-balance sheet securitization activities, which is subjected to lesser risk weight, in order to reduce their capital requirement. For instance, banks are provided with an incentive to replace direct lending (bearing 100 per cent risk-weight), with investing indirectly through loan sales without recourse (bearing 0 per cent risk-weight). Therefore, the major benefit sought by the banks from securitizing is an accounting or regulatory transfer that leads to reduced regulatory capital requirement and an improved capital structure. If this is the case, securitization would be a substitute to banks' lending activity.

Another possibility how securitization activity might decrease lending is its ability to generate larger income but with lesser risk. Boyd and Gertler (1994) report that providing credit lines for highly rated commercial paper issues can be as profitable as providing the loan directly. That is, fee income on the credit line is roughly as large as net interest income would be on a commercial loan of the same size. This generation of fee income is a major incentive for banks to get involved in securitization activity, a motive coincident with the declining in lending. In addition, conventional wisdom dictates earnings from securitization are more stable than loan earnings and securitization activity reduces bank risk via diversification, (De Young and Roland, 1999). Hence, commercial banks are motivated to increase its securitization activity while compromising bank lending.

Apart from concentrating on the impact of securitization on total lending, a number of studies in the academic finance literature have examined the impact of securitization on banks' lending portfolio and its risk profile. In the same models that analyze theoretically securitization and lending relationship, Santomero and Trester (1998) further illustrates how the impact of securitization on risk is ultimately an empirical

issue. Securitization *per se* will decrease risk inherent in a bank portfolio. Bearing in mind that banking business is all about risk-taking, this will make acquiring more risk a possible option for banks. Hence, the question whether banks experience an increase or a decrease in risk depends on the relative magnitude of the reduced risk following securitization and the increase in risk following the additional risk-taking activity. Empirically, Strahan and Cebenoyan (2004), Ambrose *et al.* (2003), Georges and Harchoui (2003) and Angbazo (1997) find evidence that is consistent with Santomero and Trester (1998) model.

On the other hand, Boot and Thakor (1991) advances market discipline hypothesis. According to this hypothesis, securitization instruments (refers to standby letters of credit (SLC)s and commitments), are uninsured contingent claims whose values increase with the safety of the issuing bank. Therefore, they provide an incentive for banks that issue these claims to increase their safety and it also offers relatively safer banks a comparative advantage in issuing these claims. Hence, securitization may occur in larger quantities for safer banks or induce riskier banks to become safer. Reichert and Shyu (2003), and Reichert and Chaudhry (1999), findings lend support to market discipline hypothesis.

In conclusion, those observations suggest two notable deficiencies in this area of research. First, empirical evidence on how securitization affects lending, particularly pertaining to Islamic banks, is scant, despite the fact that few descriptive researches (Allen and Santomero, 2001; Schmidt *et al.*, 1999) have claim the role of commercial banks as credit providers is diminishing with the increase in their securitization involvement. Another notable characteristic of previous researches is the tendency to restrict their research to either only single or a few items of securitization instruments, for example Brewer *et al.* (2000) focus only on derivatives while Cebenoyan and Strahan (2004) study the impact of loan sales. Therefore, they could not capture the overall impact of commercial banks' securitization involvement on bank lending as well as the risk inherent in their lending portfolio.

Research design

The model

Among empirical models developed to capture the relationship between bank lending and securitization activity are Cebenoyan and Strahan (2004) and Brewer *et al.* (2000). We choose to adopt Brewer *et al.* (2000) model as the foundation in our study, to determine whether securitization is a complement or substitute to lending. However, our model differs from the former in two respects. First, while Brewer *et al.* (2000) concentrates only on derivatives and lending, we incorporate both derivatives and traditional securitization instruments. Second, we employ the securitization indicator, an alternative measure of banks' involvement in securitization activity.

The foundation of the model is a regression relating banks' on-balance sheet lending to a securitization indicator that measure the extent of a bank's involvement in securitization. Existing theoretical frameworks offer contrasting predictions on the association between banks' securitization activity and its lending behavior. On one hand, Diamond (1984) and Santamero and Trester (1998), advance rigorous theoretical models suggesting complementarities between securitization (some refers to traditional securitization, some to derivatives) and bank lending. Though differ in explanations, those models reach the same conclusion that securitization eases illiquidity or asymmetric information problems, therefore reducing risk and increase banks willingness to participate in greater real sector investment. Subsequently, we

would expect a positive association between securitization instruments and bank lending.

Alternatively, the regulatory capital arbitrage hypothesis (Jones, 2000) suggests that most banks tend to react to capital pressures by shifting their on- to off-balance sheet (securitization) activities. This is due to the disparities between regulatory and market risk among banks' asset composition. Some of the securitization instruments are assigned lower risk conversion factor as compared to bank loans. Therefore, banks are able to significantly lower their assumed risks through substituting lending with securitization. Accordingly, this prediction is expected to be more apparent if banks are relatively more capital constraint. Pursuit of securitization as replacement for lending activities would imply that securitization will be a substitute to bank lending. If these activities are substitutes, we would expect a negative coefficient on the securitization instruments.

To consistently estimate such a relationship, however, we have to take into account the effects of other potential determinants of bank lending. Therefore, control variables representing banks specific characteristics and the state of the economy are included to ensure that the coefficient of the securitization instruments are not capturing the effects of other bank-specific characteristics and loan demand related factors.

The inclusion of bank capital as control variable follows Horiuchi and Shimizu (1998) who advance a hypothesis that differs from conventional wisdom regarding the positive relationship between capital and bank lending. They argue that bank capital will exert a negative impact on lending if regulatory capital is non-binding on the commercial banks. According to their analyses, while the banks' expansion of risk-taking increases the option value for banks shareholders, it increases the probability of bank failures and thereby increases the probability that shareholders will lose the charter value that they enjoy so long as their banks continue to operate. Therefore, the larger amount of equity capital leads to more conservative risk-taking by the banks. Thus, they hypothesized "when the risk-based capital adequacy constraint is non-binding, a decrease (an increase) in the capital asset ratio increases (decreases) the optimum risk-taking because it strengthens (weakens) the shareholders' incentives to expand risk-taking". Preliminary data inspection demonstrated that Islamic banks in Malaysia are not capital constraint, at least during the study period. Therefore, we hypothesize a negative relationship between capital and the growth in bank lending.

Various researches on bank lending have also documented a significant relationship between loan growth and the quality of loan portfolio, among others Brewer *et al.* (2000), Sharpe and Acharya (1992) and Furlong (1992). Ratio of loan loss provisions to total asset is adopted as a proxy for bank loan portfolio quality. Bank portfolio quality serves as an indicator of the economic environment in which a bank operates. A lower ratio of loan loss provisions to total asset is indicative of a stronger economic environment and could be associated with a higher loan growth. Subsequently, it is hypothesized that loan growth is negatively related to the ratio of loan loss provisions to total assets.

Gross domestic product (GDP) variables are included to control for demand factors, bearing in mind that this study aims to identify only the supply-side effects. It is expected that demand for loans are greater during economic expansion to finance the growing economic activity. Therefore, we anticipate a positive relationship between loan growth and GDP.

We include a number of one-period lagged variables for two reasons. First, because it distinguishes between contemporaneous and lagged responses. Second, the bank

balance sheet data is only available on an annual basis. As such we can only identify changes in lending behavior on an annual basis. Given that bank's balance sheet structure may respond in less than a year, hence we believe it best to include one-period (one year) lags in order to be able to identify the relevant portfolio adjustments.

On the basis of the analysis outlined above, the bank-financing model is specified as follows:

$$\text{FINANCING}_{i,t} = \alpha_0 + \alpha_1 \text{SEC}_{i,t} + \alpha_3 \text{CAR}_{i,t-1} + \alpha_4 \text{LLPA}_{i,t-1} + \alpha_5 \text{GDP}_{t-1} + \epsilon_{i,t} \quad (1)$$

where FINANCING, growth in log of total financing; securitization indicator (SEC)[2]; capital to assets ratio (CAR), (lagged one period); ratio of loan loss provision to total assets (LLPA)[3], ratio of financing loss provision to total assets (lagged one period);and GDP, growth rate of logged GDP (lagged one period).

Given that we are equally interested in observing whether there is any effect of securitization on banks' lending portfolio risk, we segregate banks' total loans to three different categories, namely real estate loan, commercial and industrial loans and consumer loans. The segregation of total loans into these three categories to observe bank portfolio risk follows Sinkey (1995), Hancock *et al.* (1995), Berger and Udell (1994) and Watanabe (2004). Real estate loans, commercial and industrial loans represent the riskier loans relative to consumer loans. Berger and Udell (1994) argue that commercial and industrial loans as well as real estate loans are the higher risk loan since they are in the riskiest component of the Regulatory Bank Capital Category, whereas consumer loan is relatively less risky as they have low variations in return. Besides, this segregation is also consistent with statistics on non-performing financing by sector in Malaysia, which indicates that real estate financing and commercial and industrial financing have the highest rate of non-performing financing as compared to consumer financing.

These three financing categories mentioned above would be subject to the same set of regressors as in equation (1). Thus, the specification of the segregated financing to each financing sector would take the following general form:

$$X_{i,t} = \alpha_0 + \alpha_1 \text{SEC}_{i,t} + \alpha_3 \text{CAR}_{i,t-1} + \alpha_4 \text{LLPA}_{i,t-1} + \alpha_5 \text{GDP}_{t-1} + \epsilon_{i,t} \quad (2)$$

where $X_{i,t}$, a vector of financing categories.

The variable of interest is the direction as well as the relative magnitude of the securitization indicator coefficients in equation (2). They capture the impact of securitization activity on each financing portfolio. The question of the impact of securitization activity on risk inherent in bank financing portfolio is an empirical issue. The market discipline hypothesis suggests that securitization induces banks to become safer. This is due to the fact that securitization instruments are uninsured contingent claims whose value increases with the safety of the issuing banks. Therefore, to increase the credibility of their securitization instruments, banks are pressured to limit its risk enhancing activities. One way is to reduce its financing activity particularly to risky sectors, as proxies by real estate and commercial and industrial financing. If this hypothesis holds, we expect a negative relationship between financing to all three sectors and securitization indicator; with the largest negative coefficient on real estate financing.

On the other hand, the Moral Hazard Discipline argues that due to the disadvantages of warehousing lower risk, lower return loans, banks prefer to

concentrate on higher risk-higher return loans for their on-balance sheet financing while choosing the least risky loans for their off-balance sheet securitizations. Besides, Santomero and Trester (1998) claim that since securitization *per se* is a risk reducing activity, this reduced risk encourages banks to be more aggressive in risk-acquisition activities, as risk-enhancing activities are highly rewarding activities. Therefore, banks are more willing to extend loans, especially to more risky sector. Subsequently, we expect a positive coefficient on securitization indicator, with real estate lending bearing the largest magnitude.

Data sources and descriptions

The bank-specific data for the empirical analysis are from the particular banks' annual report. These reports were obtained from respective banks' website, The Malaysian Central Bank Information Centre and The Malaysian Institute of Bankers Library.

Apart from that, this study employs annual data, from 1994-2004. Following Georges and Harchaoui (2003), this research adopts annual data since the interest is to observe the long-term impact of securitization on banks' lending, In other words, using annual data allows this research to capture more discretionary rather than autonomous behavior. Besides, annual data represents the highest periodicity for which data is systematically available.

Four different measures of financing are employed in this study, which is total financing, consumer financing, real estate financing and commercial and industrial financing. Total financing refers to gross financing by banks in an accounting year. Consumer financing consists of financing granted for personal use, purchase of consumer durables, purchase of passenger cars and credit cards, excluding financing granted to individuals to purchase securities and residential property. While total financing and consumer financing are readily available from banks' annual report, real estate financing and commercial and industrial financing has to be derived by adding the sectors that correspond to their definitions. Real estate financing is made up of construction, residential property, non-residential property and real estate financing. This is consistent with the definition of real estate loan defined by Sinkey (1995), all financing allocated to the process of acquiring, developing and constructing real estate. Commercial and industrial financing refer to financing extended to productive economic sectors that are agriculture, hunting, forestry and fishing, mining and quarrying, electricity, gas and water, wholesale and retail trade, restaurants and hotel, finance, insurance and business services and transport, storage and communication.

The measurement of securitization merits some discussion. Conventional analysis commonly employed either the ratio of notional value of securitization instruments to total assets, (Georges and Harchoui, 2003; Sinkey and Carter, 2000) or a dummy (Brewer *et al.*, 2000; Cebenoyan and Strahan, 2004; Ambrose *et al.*, 2004) to measure securitization activity. However, these measures have their limitations. Taking the ratio of notional value of securitization instruments to total assets as securitization indicator is acceptable when a study is focusing on certain instruments. However, when the interest is on the overall securitization portfolio, this measure could be bias since it does not reflect the quantity of securitization instruments involved.

Therefore, we suggest a new indicator to measure the extent of a bank's securitization activity. It takes into account the ratio of notional value of each securitization instruments to total assets and the variety of instruments that a bank is involved in[4].

Empirical results

The model is specified in log to allow for non-linear relationship between the explained and explanatory variables. Besides, logged variables could minimize its variance, so that the estimates are less sensitive to outlying observations. The variables to be regressed are treated following the standard rules of thumb for taking logs by Wooldridge (2000). Log is taken on variable with positive ringgit amount such as GDP and financing; while a variable that is a proportion or a percent that is ratio of non-performing financing to assets, would be regressed on level form.

Therefore, unit root test is conducted on the variables in the form that they will be regressed; for example, log GDP for GDP and LLPA for ratio of financing loss provision to total assets. Unit root test is conducted to test for the non-stationarity of the data. The choice of panel unit root test follows Cosar (2002), who claims that Levin, Lin and Chu (LLC) test is preferred because of its large potential power gains. Besides, LLC test is widely used in empirical researches." Given that the sample is relatively small, this study considers Im, Pesaran and Shin (IPS) panel data unit root test as well since "IPS test has better small sample properties than the LLC test and has the additional advantage of simplicity", Cosar (2002).

Table I summarizes the test on each variables employed in the regression. The second and third column refers to the result for LLC and IPS test, done on each variable at level. Upon finding some of the variables contain unit root at level, we proceed to test those variable, for stationarity at first difference. The results are reported in column four and five of Table I.

Both LLC and IPS test the null that each individual time series contains a unit root against the alternatives all-individual series are stationary. In Table III, test statistics are reported and those that reject the null are marked with star. Unit root test indicates that some of the variables, FINANCING and COMIND are not stationary at level, (refer Table I). However, all variables are stationary at first difference. Therefore, the variables will be regressed at first difference, to avoid spurious regression.

Models estimation follows the standard panel data estimation method. First, models are estimated using both fixed effects and random effects model. However, since each model displays autocorrelation problem, we estimate the model using panel generalizes least square (GLS), following Sayrs (1989) who suggest that if the model exhibits autocorrelation and/or moving average errors, GLS corrected for

	Level		First difference	
Variables	Levin, Lin and Chu	Im, Pesaran and Shin	Levin, Lin and Chu	Im, Pesaran and Shin
LGDP	0.32176	4.17376	−12.1904*	−5.44529*
LFINANCING	2.46233	6.05773	−30.5342*	−4.79155*
TAR	0.33054	0.33962	−4.11453*	−1.44756*
SEC	−4.98252*	−1.45111*	−59.5735*	−14.7862*
LREALESTATE	−1.81731*	−0.57126*	−1.17620*	−3.13514*
LLPA	−238.556*	−102.343*	−103.668*	−44.9370*
LCOMIND	1.37529	1.25754	−2.42425*	−1.54523*
LCONSUMER	−6.95862*	−0.33549*	−7.61213*	−3.49737*

Note: * Denotes stationary series

Table I.
Summary of unit root tests

errors may be used. In addition, Yaffee (2003) claims that models have to be estimated by methods that handle the problem afflicting them.

We assigned cross-section weight in each regression since it takes into account the presence of cross-section heteroskedasticity in estimation. It allows for a different residual variance for each cross-section. Residual between different cross-section and different periods are assumed to be zero. In addition, we use White's method of estimation to take care of the heteroskedasticity problem; therefore, the estimators reported are heteroskedasticity consistent covariance estimate. Jacque-Bera statistics on the residual is calculated to inspect whether the residuals are normally distributed. The reported probability is the probability that a Jacque-Bera statistic exceeds the observed value under the null hypothesis. A small probability value leads to the rejection of the null hypothesis of a normal distribution.

Table II gives results for GLS estimate for bank financing. The result demonstrates that bank financing activity is determined primarily by banks' specific characteristics, which are capital, level of securitization activity and its financing loss provisions. The insignificance of GDP in influencing banks' financing decision indicates that banks rely more on their balance sheet indicator as a signal of economic condition rather than the general measure of economic performance. The findings also suggest that a bank's financing decision is not made in isolation. Instead, it is jointly determined by the interactions of banks' capital need, their alternative activity which is securitization as well as the provisions to absorb financing losses.

More important, the variable of interest, securitization index is negatively and significantly related to bank financing activity. The results indicate that a 1 per cent increase in securitization indicator would lead to a 10 per cent decrease in financing growth rate. This shows that securitization and bank financing activity is substitute. The more active a bank is in securitization activity, the more a bank decreases its financing activity.

There are two possible explanations for these findings, which are regulatory capital arbitrage hypothesis or income diversification hypothesis. The regulatory capital arbitrage hypothesis suggests that due to the differences in economic capital and regulatory capital, banks are motivated to participate in securitization activities, to arbitrage capital. In order to fulfill capital adequacy requirement, banks are motivated to increase its securitization activities, which offers competitive returns,

Variable	Coefficient	SE	*t*-statistics
Constant	0.303616	0.093774	3.237749***
SEC	−0.104160	0.036979	−2.816732*
TAR	−0.697207	0.389677	−1.789193*
LLPA(−1)	−8.359345	4.505478	−1.855733*
GDP(−1)	−0.007061	0.596409	−0.011840
AR(1)	0.550284	0.092918	5.922243***
Adjusted R^2-	0.670800		
Durbin-Watson statistics	1.972835		
Jacque-Bera statistics (probability)	1.153638 (0.561682)		

Table II.
Results of regression on total financing

Notes: *, *** Denotes significant at 1, 10 and 5 per cent confidence level, respectively; convergence achieved after 10 total coefficients iterations

yet with lesser risk and much lesser capital requirement, as compared to financing. As such, an increase in securitization activities would lead to a decrease in financing growth.

On the other hand, the income diversification hypothesis claims that banks are increasingly devoting their activities towards securitization due to the possibility of acquiring substantial income from this activity. Banks are induced to substitute fee income for interest income by offering more fee-based services due to the declining interest margin and deterioration of a banks' asset quality, (Koch and McDonald, 2003).

Then, we segregate total financing into three sectors namely, real estate financing, customer financing and commercial and industrial financing, to study whether securitization induces commercial banks to shift their financing portfolio composition. To make the results on financing portfolio comparable, the explanatory variables and the estimation method follow the total financing model discussed above.

The results of regressions on these segregated financing sectors are presented in Table III. Securitization indicator is significantly, and negatively related to real estate, consumer and commercial and industrial financing. A 1 per cent increase in securitization activity would decrease the growth rate of sectoral financing by 9.6, 45 and 24 per cent, respectively.

These findings indicate that although generally, financing to each broad categories are reduced following securitization, the magnitude of the reduction in each sector differs substantially. Islamic banks opt to reduce consumer financing significantly, followed by commercial and industrial financing and real estate financing. In terms of riskiness associated with these financing, real estate is the most risky while consumer financing is the safest. Therefore, these results suggest that as Islamic banks become more involved in securitization activity, they tend to have riskier financing portfolio. These observations are consistent with Moral Hazard hypothesis. According to this hypothesis, banks choose to retain high risk-high return financing in their portfolio following securitization activities, while compromising the low risk-low return financing with securitization activity. Hence, banks are left with a riskier financing portfolio following securitization.

Variables	Real estate financing	Commercial and industrial financing	Consumer financing
Constant	0.371835* (0.049746)	0.170103** (0.061900)	0.587354* (0.105915)
SEC	−0.096413* (0.015684)	−0.241321*** (0.082037)	−0.458783* (0.040046)
TAR	3.698841* (0.436328)	0.278624 (0.395948)	6.481808*** (1.809281)
DLGDP (−1)	−2.149774*** (0.611204)	2.518200** (1.331522)	−1.007784 (1.136375)
LLPA(−1)	−7.841753** (2.816816)	−4.495405 (7.739863)	−14.25826*** (6.064172)
AR(1)	0.143672* (0.019854)		
Adjusted R^2	0.668020	0.294548	0.666298
Durbin-Watson Statistics	1.934014	2.016461	2.069645
Jacque-Bera Statistics (probability)	0.551542 (0.758987)	1.605416 (0.448114)	2.912763 (0.233078)

Notes: Figures in parentheses are white consistent covariance estimates standard errors; *, **, *** denotes significant at 1, 10 and 5 per cent, respectively

Table III.
Results of regression on sectoral financing

Collectively, this study finds that bank securitization activity by the Islamic banks in Malaysia from 1994-2004, significantly reduces their financing growth. This implies that securitization is a substitute to bank financing. Empirical evidence also supports the moral hazard hypothesis. Banks that are actively involve in securitization activity, reduce their safest financing first, followed by more risky financing. Therefore, although banks' financing generally decrease, banks' financing portfolios are more risky with securitization.

Conclusions

The impact of securitization on Islamic banks on-balance sheet financing and its financing profile is addressed in this paper. Besides the contradiction between theoretical conducts that attempt to explain the issue, it is also highly relevant in an economy like Malaysia where lending channel is one of the main monetary transmission mechanisms. Contrary to findings by previous researches (Brewer, 2001; Strahan and Cebenoyan, 2004) on US commercial banks that suggest securitization complementarily increases bank lending and subsequently enhancing the risk inherent in their lending portfolio, we observe that where the Malaysian Islamic banks are concern, securitization is a substitute to bank financing. Further inspection on their financing portfolio exposes that banks reduce their safest financing the most, followed by more risky financing. This supports the moral hazard hypothesis that banks retain their high risk-high return financing in their portfolio while reducing low risk-low return financing.

Taken together, the findings imply that securitization restraints Islamic banks financing activity. Hence, Islamic banks' involvement in securitization warrants some guidelines since the evidence dictates it is affecting banks' on-balance sheet financing negatively. More so, banks choice of financing portfolio following securitization is a high risk-high return portfolio. Given that securitization is substituting bank financing activity, and it encourages banks to concentrate more on risky financing, regulators need to structure a regulation to limit securitization activity by Islamic banks as we fear that excessive securitization could diminish their role as credit provider and subsequently leading to credit crunch.

Notes

1. We use the word "financing" as substitute for lending, because in the conventional banks, they earn interest from their lending, but in Islamic banks, they provide financing to buy assets.
2. This study suggests a new indicator to measure the extent of a banks securitization activity. It takes into account the ratio of notional value of each securitization instruments to total assets and the variety of instruments that a bank is involved in. Mathematically, the proposed indicator for each bank can be written as:

$$= \sum_{i=1}^{N} \left[\left(\text{sec}_{i,j}, / \text{totalassets}_j \right) \left(\text{sec}_{i,j}, / \sum \text{sec}_i \right)_t \right] w_i$$

where N = number of securitization instruments
i = securitization instrument, i
j = bank j
w = market share of securitization instrument, i

The indicator for a banks involvement in each securitization instrument is given by a multiplication of the ratio of notional value of that particular securitization instrument to total assets; and the ratio of the notional value to the aggregate volume of that particular instrument. This is to overcome the bias that would prevail if only notional value of securitization transactions is used in quantifying a banks involvement in securitization activity. The two ratios are multiplied to make the difference among an active and a passive player more discernible.

The calculation describe above would yield a different indicator for each securitization instruments, for each banks. To account for variety, the indicator for each securitization instruments above, are aggregated, for each bank. Therefore, banks that adopt more securitization instruments should have a higher value. The indicator is calculated on annual basis to gauge the extent of a banks involvement in securitization activity.

3. Loan loss provision refers to general provision based on a percentage of the loan portfolio that is made to cover possible losses during that particular accounting year.
4. A detail on this securitization indicator construction can be supplied from authors upon request.

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