Islamic Financing and Bank Risks: The Case of Malaysia

Janice C. Y. How ■ Melina Abdul Karim ■ Peter Verhoeven

Executive Summary

We examine whether Islamic financing can explain three important bank risks in a country with a dual banking system: credit risk, interest-rate risk, and liquidity risk. Using Malaysian data, we find that commercial banks with Islamic financing have significantly lower credit and liquidity risks but significantly higher interest-rate risk than banks without Islamic financing. There is also evidence that bank size is significantly related to credit risk; the proportion of loan sales to total liabilities and bank size are significant determinants of interest-rate risk; and off-balance-sheet financing, the extent of securitization, loan volatility, bank capital, and bank size are statistically significantly related to liquidity risk. © 2005 Wiley Periodicals, Inc.

INTRODUCTION

There is broad agreement that a substantial number of bank failures may destabilize the system of monetary payments and control, and impair the flow of funds to borrowers lacking access to capital markets. Because of the perceived link between banks’ financial stability and the performance of the economy, it is therefore not surprising that the amount of risk faced by banks is of substantial concern to policymakers. The importance of studying bank risks is readily reflected in the Basle Committee’s constant and ongoing effort to account for it in the risk-based capital adequacy guideline.

In this study, we focus on three important bank risks: credit risk, interest-rate risk, and liquidity risk. Specifically, we examine whether Islamic financing is related to...
these risks by studying a sample of 23 commercial banks in Malaysia over the period 1988–1996. Other possible determinants of these bank risks are also explored and tested. We focus on the Malaysian banking system, as it is unique in having both conventional and Islamic interest-free mechanisms operating side by side. Also, Malaysia has developed the most sophisticated and successful transition of its banking sector to accommodate Islamic banks (El-Gamal, 1999).

Today, Islamic banking and finance has become a US$100 billion industry and is estimated to grow at a rate of 15 percent per annum (Hamwi & Aylward, 1999). However, despite the growing interest in Islamic banking and finance in both the international business and academic1 communities, Islamic financial markets are deficient in both liquidity and risk management tools. This is due, in part, to the lack of research in this area (Iqbal, 1999).

Our study therefore fills the void by providing an insight into the role of Islamic financing in bank-risk determination. It also contributes to the vast literature on the determinants of bank risks by testing the generality of previous empirical findings with respect to a country that possesses a dual banking structure. Our results show that commercial banks in Malaysia that offer Islamic financing facilities have significantly lower credit and liquidity risks but significantly higher interest-rate risk than banks that do not offer such facilities. We also find that (1) bank size is a significant determinant of credit risk; (2) the proportion of loan sales to total liabilities and bank size can explain differences in interest-rate risk across banks; and (3) off-balance-sheet financing, the extent of securitization, loan volatility, bank capital, and bank size are significant determinants of liquidity risk.

The remainder of this article is structured as follows. The next section provides a description of the institutional structure of the banking system in Malaysia, with a focus on Islamic financing. This is followed by a discussion of the testable hypotheses, data, and empirical results. The final section concludes the article.

THE MALAYSIAN BANKING SYSTEM AND ISLAMIC FINANCING

Banking in Malaysia can be traced back to 1859 when the first commercial bank in Malaysia, the Chartered Mercantile Bank of India, London and China, was established. The first domestic bank was incorporated in 1913, but a comprehensive financial sector emerged
only after the establishment of the Central Bank of Malaysia in 1959. Total resources of the financial system increased at least fourfold each decade from 1960 to 1990, primarily due to the growth in the banking sector. At the end of 1996, total financial resources of the system amounted to RM915.2 billion (Bank Negara Malaysia Annual Report, 1996).

There has also been a broadening and deepening of the financial structure as the economy grew in size, complexity, and sophistication and the demand for new financial services and instruments arose. On March 4, 1993, the Islamic Interest-Free Banking Scheme was launched by the Minister of Finance. All commercial banks, merchant banks, and finance companies were eligible to participate in the Scheme. By the end of November 1995, 21 commercial banks offered some sort of Islamic banking facility. To date, 22 Islamic products have been introduced. These products are a hybrid of five basic Islamic financing structures: Murabahah, Mudharabah, Al-Ijarah, Musharakah, and Bay’al-Salam.2

Islamic banks offer financial instruments that are consistent with the religious beliefs and cultural characteristics of Muslim societies. The essential feature of Islamic banking is that it is interest-free.3 Islam prohibits Muslims from taking or giving interest (riba), defined as any predetermined or fixed return from financial transactions including both deposits and loans, regardless of the purpose for which such loans are made or how low the rate of interest charged is. The prohibition of riba is mentioned in four different revelations in the Qur’an,4 which also declares that those who disregard the prohibition of interest are at war with God and His Prophet. Some scholars have also put forward economic reasons5 as to why interest is banned in Islam. A common thread running through all these reasons is the exploitative character of the institution of interest. A result of this is that the Islamic financial system is primarily equity-based, with Islamic banks conducting business on a profit-/loss-sharing principle. Under this arrangement, the provider of capital and the entrepreneur share in the risks and rewards of a venture (Iqbal & Mirakhor, 1999).

**Hypotheses**

In this section, we develop hypotheses on the relationship between Islamic financing and three main types of bank risks: credit risk, interest-rate risk, and liquidity risk. Other pertinent determinants of these risks are also discussed and will be controlled for in our tests.
Credit Risk
The primary risk faced by banks is credit risk. This risk arises from the possibility of default by a counterparty—i.e., the promised cash flows on primary securities held by banks may not be paid in full. Credit quality problems can result in bank insolvency or in a significant drain on bank capital and net worth. This, in turn, may adversely affect a bank’s growth prospects and its ability to compete with other domestic and international banks (Saunders, 1997).

The mid-1980s crisis demonstrates the potentially “fatal” effects of credit risk where huge bank losses were recorded in a number of countries, including Malaysia. In Malaysia, heavy losses for a number of banks due to nonperforming loans resulted from the sharp economic recession of 1985–1986 when the nominal gross national product as well as share and property prices fell drastically. The twin effects of rising interest-in-suspense and bad debt provisions reverberated throughout the banking industry. The experience of Bank Bumiputra, one of the nation’s largest commercial banks, also illustrates the costly effects of credit risk.

To Islamic banks, credit risk depends somewhat on the type of Islamic financing structure in place. In particular, we argue that the risk in Murabahah (markup-based) financing is substantially less than that in the other Islamic financing structures. This is because under the Mudharabah, Musharakah, Ijara, and Bay’al-Salam financing, the finance provider puts at stake the entire amount of capital that he provides as well as the opportunity cost of capital for the entire period until the capital is returned. In contrast, risk bearing is only up to the stage when the goods are handed over to the capital user in a Murabahah financing arrangement.

Ray (1995) notes that Islamic banks rely mainly on Musharakah and Mudharabah for projecting financing and are thus more vulnerable to poor-quality projects than are interest-based banks. This is because if a project breaks even, the Islamic bank gets nothing, whereas if the project fails, the bank can lose some or all of its capital with no legal recourse for its recovery.

However, the above argument may not apply to Malaysian banks where the Islamic financing contract that is predominantly adopted is based on Murabahah. Rosly (1999) notes that Murabahah (and al-bay’ bithaman ajil) products command 85 to 90% of Bank Islam Malaysia Berhad’s assets in recent years. As noted above, Murabahah carries the lowest risk relative to the other cases. In addition, there are
a number of reasons why Islamic financing may be associated with lower credit risk. First, the assets of Islamic banks are mostly debt resulting from sale-based financing while their deposits are on a Mudharabah (profit-sharing) basis. Kahf (1999) argues that this feature enables Islamic banks to shift the risk of debt default to investment depositors in proportion to their amount of principal invested, rather than to capital alone. This principle of profit sharing has, in fact, offered an important cushion for bankers at times of recession and he cites the experience of Pakistani banks as an example.

Further, even though a substantial part of an Islamic bank’s portfolio is venture capital without any guaranteed return, we expect Islamic banks to conduct “credit” checks and perform feasibility studies before entering into a new venture. The community financing nature of Islamic banking, where Islamic (no-interest) bankers use the “know your client” rule extensively in their lending decision, is another reason why Islamic financing may be associated with lower credit risk.9

Consequently, we hypothesize that the higher the extent of Islamic financing (which is predominantly based on Murabahah) used in Malaysian banks, the lower the credit risk. Unfortunately, data on the extent of Islamic financing are often not available. This data limitation thus constrains us to test only the effect of the adoption (or otherwise) of Islamic financing on bank risks. The hypothesis is therefore:

**H1: Banks with Islamic financing facilities have, on average, lower credit risk than banks without Islamic financing facilities.**

In our tests, ISLAM takes the value one for banks with Islamic financing facilities, and zero otherwise. As in previous studies (Angbazo, 1997; Avery & Berger, 1991; Brewer & Koppenhaver, 1992; James, 1988), credit risk (CREDIT) is proxied by the proportion of allowance for loan loss to total assets.10

We also control for other determinants of banks’ credit risk. From the literature, we note that the increased involvement of commercial banks in off-balance-sheet activities11 has introduced new types of credit-risk exposures. A review of the banks’ annual reports suggests that forward contracts are the main form of financial derivatives used by Malaysian banks. In 1996, forward exchange contracts worth RM66.7 billion contributed 4% of the banks’ contingent liabilities. Activities in these off-balance-sheet activities may pose a problem to
the solvency of banks. By venturing into this form of derivatives, commercial banks increase their exposure to contingent credit risk (i.e., one of the counterparties to the contracts may default on payments). Therefore, banks with more dealings in derivative contracts are expected to have higher credit risk. The derivative contracts (DER) we examine are forward foreign exchange contracts, interest-related contracts, and swaps facilities.

Another form of contingent liability disclosed in the annual reports of commercial banks in Malaysia is documentary credits. The issue of documentary credits increased from RM6.8 billion in 1992 to RM8.8 billion in 1996. In Malaysia, documentary credits include standby letters of credit, transferable documentary credit, back-to-back documentary credit, revolving documentary credit, and red clause documentary credit. Of these, standby letters of credit are used most commonly (Pang, 1991).

Benveniste and Berger (1986) note that standby letters of credit may substitute for risky balance-sheet loans and can therefore create credit risk for the issuing bank. Since commercial banks in Malaysia do not separately disclose standby letters of credit from other documentary credits, we control for the proportion of documentary credits to total capital (denoted by DOC) in our tests.

Another variable we control for is the securitization of loans. Many observers of the securitization trend (e.g., Rosenthal & Ocampo, 1990) contend that securitization enables market participants to adjust their risk profiles more effectively than is possible under institutional or bank intermediation. This process of unbundling the various stages of the credit intermediation process enables credit to be extended by lenders to borrowers while separating and distributing more widely the different risks historically associated with that process.

Bank Negara Malaysia (central bank) set up the National Mortgage Corporation (Cagamas) as a secondary mortgage market institution in December 1986. The main role of Cagamas is to purchase housing loans from loan originators and “repackage” them as the basis against which bearer mortgage fixed or floating rate can be issued. By selling their mortgage loans to Cagamas, commercial banks have also, indirectly, sold the credit risk associated with such loans. Therefore, we expect that banks with a lower proportion of loan sales to total assets have, on average, higher credit risk. We denote the ratio of loan sales to total assets by \( LNSL \).
**Interest-Rate Risk**

The primary source of interest-rate risk stems from timing differences in the repricing of interest-rate sensitive assets and liabilities of the bank. These repricing mismatches are fundamental to the business of banking and generally result when banks borrow long-term to fund short-term assets or when banks borrow short-term to fund long-term assets. Besides differences in timing, differences in the interest-rate sensitivity of assets and liabilities may also expose banks to interest-rate risk. The interest-rate risk of Islamic banks will therefore depend on their exposure to these two factors.

Baldwin (2002) states that many Islamic banks do not pay much attention to managing interest-rate risk due to the erroneous belief that an Islamic bank, by virtue of its Sharia-compliant operations, is not subject to this risk. He claims that generally there is a lack of awareness of the need for bank-risk management in the Middle East.

Rosly (1999) argues that Islamic banks in Malaysia have less flexibility on the asset side than conventional banks, which can instantly pass on interest-rate changes to many of their customers. This is due mainly to the fact that Islamic financing in Malaysia typically takes the form of *Murabahah* (and *al-bay’ bithaman ajil*), which is a fixed-rate asset. In fact, he argues that overdependence on deferred sale financing (*Murabahah*) implies that most assets will not be sensitive to changes in market interest rates. Since all Islamic liabilities are interest-sensitive (i.e., *hibah* and dividend rates can be altered according to prevailing competitive market rates), he argues that fund gaps of Islamic banks will always be negative. Consequently, Islamic banks are inevitably at a disadvantage in the face of changing interest rates. This is supported by his findings that profits declined in Bank Islam Malaysia in periods of rising interest rates when the interest margins of conventional banks increased.

Rosly’s argument is shared by Bank Negara Malaysia in its 1997 annual report, where it noted that since 90% of Islamic financing is negotiated on fixed-rate terms, it was concerned that Islamic banking could not react swiftly to changing interest rates due to the absence of a floating rate option. In its annual report, Bank Negara also called on Islamic banks to come up with a floating rate product that can swiftly react to volatile economic environments.

The above suggests that Islamic financing is associated with higher interest-rate risk. We therefore hypothesize the following:
H2: Banks with Islamic financing facilities have, on average, higher interest-rate risk than banks without Islamic financing facilities.

As in Flannery and James (1984), we proxy banks’ interest-rate risk by the maturity gap (GAP), measured by the ratio of the difference between the dollar value of liabilities subject to repricing within one year and the dollar value of assets subject to repricing within the same time period to total capital.¹⁴

We control for off-balance-sheet instruments in our test of the above hypothesis. Shanker (1996) and Schrand (1997) show that these instruments can affect an institution’s maturity composition. Specifically, they find that the use of derivative instruments reduces the interest-rate risk of banks. In line with these findings, we expect that banks with a higher proportion of financial derivatives to total assets (DER) have, on average, lower interest-rate risk.

Another form of off-balance-sheet activities is loans sold to Cagamas. When loans are sold, their effective maturity to the selling bank is essentially the interval between origination and sale. Thus, securitization may substantially reduce the bank’s average asset duration and, in the case of a bank with long-term mortgages and short-term deposits, its interest-rate risk. This is confirmed by Angbazo (1997), who finds a negative relationship between loan sales and interest-rate risk. We thus expect that banks with a higher proportion of housing loans sold to Cagamas to total assets (LNSL) have, on average, lower interest-rate risk.¹⁵

Not all off-balance-sheet activities reduce interest-rate risk. Koppenhaver (1990) finds that although some off-balance-sheet activities are contingent claims that generate fee income, they also create portfolio risk, such as interest-rate risk. Specifically, he finds that banks with large maturity gaps tend to be those with high volumes of standby letters of credit. Therefore, we control for the proportion of documentary credits to total capital (DOC) in our tests.

Liquidity Risk
Liquidity risk arises whenever the banks’ customers demand immediate cash for their financial claim. Ray (1995) identifies the lack of liquidity as a major problem faced by Islamic banks. In fact, liquidity problems have been purported to be the major impediment to the growth of Islamic banking (Vogel & Hayes, 1998).
There are at least two reasons for liquidity problems in Islamic banks. The first reason stems from the disharmony between central banks and Islamic banks concerning the refusal of central banks to provide funds on a basis other than interest lending. Since Islamic banks cannot borrow on interest, they are without a lender of last resort. Therefore, Islamic banks are compelled to provide self-insurance due to their inability to diversify the risk of a bank run. Abdul-Rahman (1999) notes that Islamic banks are running their retail banking (demand deposits) operations at a self-imposed reserve requirement of 100% or close to it.

The second reason is due to the limited number of Islamically acceptable financial instruments. As a result, Islamic banks do not have the same funding options that are available to conventional banks, which can match the maturities of their deposits and loans through recourse to the money or capital markets. The absence of an adequate money market or a secondary capital market for Islamic financial instruments thus complicates the problem of mismatched maturities. Consequently, Islamic banks are often unable to generate adequate returns for their depositors, many of whom expect the market rates offered by conventional banks (Henry, 1999; Ray, 1995).

However, the above reasons may not apply to Islamic banks in Malaysia. Islamic banks in Malaysia are allowed more flexibility than conventional banks in liquid asset holding requirements, specifically through the issue of Government Investment Certificates (GICs). The establishment of the Islamic Money Market in Malaysia in 1994 has facilitated secondary trading of deposits with Islamic banks, GICs, and other forms of Islamic securities (El-Gamal, 1999). Finally, unlike most other countries, Islamic banks in Malaysia are able to seek temporary financial accommodation from the central bank in the event of liquidity problems (Abdul-Rahman, 1999).

It has also been pointed out that as a custodian of trust for the depositors’ deposits, Islamic banks are likely to be more liquid compared to conventional banks. Mills and Presley (1999) claim that since equity-type liabilities are issued, the depositors have no “insolvency” incentive to “run” because the value of their deposits will fluctuate with the value of the underlying portfolio. Such a bank may face liquidity difficulties but cannot become insolvent because its losses are passed on to its depositors. The urgency to withdraw is thereby significantly reduced. For all these reasons, we predict the following for our sample of Malaysian banks:
H3: Banks with Islamic financing facilities have, on average, lower liquidity risk than banks without Islamic financing facilities.

In this study, we proxy liquidity risk (LIQUIDITY) using the ratio of liquid assets to liabilities, consistent with that proposed by Bank Negara Malaysia.16

Banks do not know in advance by how much the level of their deposits will change. However, over time, they are able to predict with some accuracy the volatility of their deposits. Dennis and Suriawinata (1996) argue that higher deposit volatility suggests instability in deposits, which leads to uncertainty in the ability to service customer withdrawals, and thus higher liquidity-risk exposure. This argument is confirmed by their results. We therefore control for deposit volatility in our tests. As in Dennis and Suriawinata, we measure deposit volatility (DEPVOL) by the standard deviation of deposits during the sample period divided by the average total assets.

Just as deposit drains can cause liquidity problems, so can the exercise by borrowers of their loan commitments and other credit lines. Liquidity problems may also arise from simply excess loan demands. Refusing loans to long-standing customers could harm customer relationships, which, in turn, could adversely affect the bank’s long-term profitability. The greater the loan volatility, the greater the risk of not being able to fulfill the unexpected loan demand. This relationship is again supported by Dennis and Suriawinata (1996). We measure loan volatility (LOANVOL) by the standard deviation of loans during the sample period divided by average total assets.17

Consistent with Angbazo (1997), we propose that the amount of these contingent loans can also affect the liquidity risk of commercial banks. In a situation where the holder of such loans (e.g., a documentary credit) should default, the bank will find itself in a position where it needs to liquidate more assets to meet such loans. Thus, we expect that banks with a higher proportion of documentary credits to total capital (DOC) and a higher proportion of derivative contracts to total assets (DER) have, on average, higher liquidity risk.

We also control for the proportion of loan sales to total assets (LNSL) in our tests. By selling housing loans to Cagamas, a bank’s liquidity is increased from the proceeds received. The results in Angbazo (1997) show a negative relationship between liquidity risk and loan sales.
Another factor affecting liquidity risk is bank capital. Dennis and Suriawinata (1996) argue that as a result of capital standards, which require banks to hold levels of capital commensurate with the credit risk, the amount of capital affects the size of the loan portfolio. However, the direction of this relationship is not clear. On the one hand, increases in capital increase depositors’ confidence and thus lower the loan-to-deposit ratio (which proxies for liquidity risk). On the other hand, increases in capital also release the bank from constraints in its loan portfolio and thus increases the loan-to-deposit ratio. However, since insured depositors, who tend to comprise a large proportion of depositors, are less likely to be influenced by changes in the bank’s capital level, the effect of capital on the loan portfolio may dominate. Thus, we control for bank capital in our tests. Following Dennis and Suriawinata, we measure capital (CAPITAL) by the book value of equity divided by total assets.

In testing the above hypotheses, we also control for bank size for a number of reasons. First, size may proxy for the extent of bank asset diversification. That is, large banks typically have better diversified asset portfolios than smaller banks. Second, it is argued that large banks can more readily borrow in the money markets because of their reputation, their diversified holdings, and their protection under the “too big to fail” doctrine (Dennis & Suriawinata, 1996). Furthermore, the evidence in Angbazo (1997) suggests that interest-rate risk is not significant for large banks given their greater concentration in short-term assets and off-balance-sheet hedging instruments. In sum, we expect larger banks to have a lower exposure to banking risk than smaller banks. We measure bank size by the natural logarithm of total assets (TASSETS).

DATA DESCRIPTION

Our sample consists of 23 commercial banks in Malaysia for which we could obtain the financial statements from 1988 to 1996. The financial statements were obtained from Bank Negara Malaysia Library, The Institute of Bankers Malaysia Library, Perpustakaan Negara Malaysia, and correspondence with commercial banks. Information such as derivative contracts, documentary credits, loan sales, total assets, and equity were hand-collected from these statements. Information on Islamic financing was obtained from the Corporate Affairs department of Bank Negara Malaysia. We also wrote to banks for details on their Islamic financing activities. Islamic financing was first provided in 1993 by two banks (8.3%) in our sample. This num-

Large banks typically have better diversified asset portfolios than smaller banks.
ber increases to six (25%) in 1994, seven (29%) in 1995, and nine (38%) in 1996.

Table 1 provides the descriptive statistics of the bank sample. The total assets of the banks in our sample average RM7,764 million with a median of RM3,185 million. Relative to the U.S. banks (as reported in Angbazo, 1997), Malaysian banks are about five times smaller. Not surprisingly, a large proportion of these assets are made up of deposits, which have an average (median) of RM6,527 million (RM2,616 million).

Credit risk is measured by the ratio of allowance for loan losses to total assets (CREDIT), which has an average (median) of 0.083 (0.042). This value ranges from 0.001 to 0.623. Maturity gap (GAP) has an average of 0.745 and a median of 0.705. The average bank in our sample has an average liquidity risk (LIQUIDITY), proxied by the ratio of liquid assets to total liabilities, of 0.169. This figure is much lower than that reported for the U.S. banks in Angbazo (1997). The standard deviations of these risk measures are reasonably high, providing us with a rationale for investigating the cross-sectional differences in the risks of Malaysian banks.

Remaining are the explanatory variables for the above three bank risks. The ratio of derivative contracts to total assets (DER) has an average of 0.151 and a median of 0.110. DOC denotes the ratio of documentary credits to total assets. It has an average of 0.041 and a median of 0.023. Loan sales (LNSL) represents about 0.012 of total assets. These figures are again smaller than those reported for similar

| Table 1. Descriptive Statistics on Commercial Banks in Malaysia, 1988–1996 |
|------------------|----------|----------|----------|----------|----------|
|                  | Average  | Median   | Std dev  | Minimum  | Maximum  |
| Total assets (RM mil) | 7,764    | 3,185    | 11,380   | 219      | 66,913   |
| Total deposits (RM mil) | 6,527    | 2,616    | 9,464    | 177      | 51,411   |
| Total loans (RM mil)  | 4,258    | 1,831    | 5,952    | 46       | 36,374   |
| CREDIT             | 0.083    | 0.042    | 0.106    | 0.001    | 0.623    |
| GAP                | 0.745    | 0.705    | 0.262    | 0.077    | 1.457    |
| LIQUIDITY         | 0.169    | 0.147    | 0.105    | 0.024    | 0.505    |
| DER                | 0.151    | 0.110    | 0.166    | 0.000    | 1.187    |
| DOC                | 0.041    | 0.023    | 0.070    | 0.002    | 0.620    |
| LNSL               | 0.012    | 0.008    | 0.017    | 0.000    | 0.129    |
| LOANVOL            | 0.243    | 0.236    | 0.139    | 0.020    | 0.485    |
| CAPITAL            | 0.077    | 0.071    | 0.064    | –0.076   | 0.809    |

CREDIT is allowance for loan losses divided by total assets; GAP is dollar value of assets minus liabilities that are to be repriced within a year divided by total capital; LIQUIDITY is the ratio of liquid assets to total liabilities; DER is the ratio of derivative contracts to total assets; DOC is the ratio of documentary credits to total capital; LNSL is the ratio of loans sales to total assets; LOANVOL is the standard deviation of loans divided by the average total assets; and CAPITAL is the book value of equity divided by total assets.
ratios in Angbazo (1997) for the U.S. banks. The average sample firm has loan volatility (LOANVOL) of 0.243 and book value of equity to total assets ratio (CAPITAL) of 0.077.

Table 2 reports how and whether the above characteristics differ for banks that provide Islamic financing and those that do not. Results from both parametric t- and nonparametric Mann-Whitney tests are provided. The results show that banks with Islamic financing have significantly higher DOC, LNSL, and TASSETS than those without. Of the three variables, only DOC is insignificant under the t-test. Overall, our findings suggest that, holding everything else constant, Malaysian banks that offer Islamic financing have a significantly higher documentary credits to total capital ratio than those that do not offer Islamic financing. The former also have a significantly higher proportion of loan sales to total assets than the latter. Further, larger Malaysian banks are more likely to offer Islamic financing products than smaller banks. These two groups of banks do not differ significantly with respect to the level of involvement in derivative contracts (DER), loan volatility (LOANVOL), and book value of equity to total assets (CAPITAL).

**EMPIRICAL RESULTS**

We provide results of the univariate tests on the relationship between Islamic financing and bank risks in Table 3. Specifically, we examine whether Islamic financing has an effect on the three major types of

<table>
<thead>
<tr>
<th>Bank Characteristics</th>
<th>ISLAM = 1</th>
<th>ISLAM = 0</th>
<th>DER</th>
<th>T-stats</th>
<th>M-Whitney</th>
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<tr>
<td></td>
<td>Frequency</td>
<td>Average</td>
<td></td>
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<tr>
<td>DER</td>
<td>42</td>
<td>0.149</td>
<td>0.063</td>
<td>0.593</td>
<td></td>
</tr>
<tr>
<td>DOC</td>
<td>42</td>
<td>0.054</td>
<td>1.504</td>
<td>3.079**</td>
<td></td>
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<tr>
<td>LNSL</td>
<td>42</td>
<td>0.017</td>
<td>2.819**</td>
<td>4.417**</td>
<td></td>
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<tr>
<td>LOANVOL</td>
<td>42</td>
<td>0.268</td>
<td>0.380</td>
<td>0.667</td>
<td></td>
</tr>
<tr>
<td>CAPITAL</td>
<td>42</td>
<td>0.073</td>
<td>0.798</td>
<td>0.884</td>
<td></td>
</tr>
<tr>
<td>TASSETS</td>
<td>42</td>
<td>23.112</td>
<td>8.390**</td>
<td>6.659**</td>
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</tbody>
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* and ** denote significance at the 0.05 and 0.01 level (two-tailed), respectively.

ISLAM = 1 if Islamic financing facilities are provided by the bank, and ISLAM = 0 if such facilities are not available.

DER is the ratio of derivative contracts to total assets; DOC is the ratio of documentary credits to total capital; LNSL is the ratio of loans sales to total assets; LOANVOL is the standard deviation of loans divided by the average total assets; CAPITAL is the book value of equity divided by total assets; TASSETS is the natural logarithm of total assets.
bank risks—credit risk, interest-rate risk, and liquidity risk. As before, results from both parametric t- and nonparametric Mann-Whitney tests are provided.

Our data show that about 26% of our sample banks have Islamic financing in place. Consistent with our hypotheses, banks with Islamic financing have significantly lower credit risk and liquidity risk than those without such a financing method. Also supporting our hypothesis, the univariate tests show that in Malaysia, commercial banks with Islamic financing have a more significant exposure to interest-rate risk than conventional banks. The results are robust irrespective of whether we use parametric t-tests or nonparametric Mann-Whitney tests.

To allow for possible interactions between the independent variables, we run multiple ordinary least squares (OLS) regressions of the relationships between each of the three bank risks and their determinants. Table 4 presents the results. Standard errors from White’s (1980) adjustment for heteroskedasticity in residuals are provided.

The results show that Islamic financing and bank size are the only significant explanatory variables for credit risk. Specifically, Malaysian banks that offer Islamic financing facilities (ISLAM) have significantly lower credit risk than those that do not have such facilities. This may be due in part to the profit-sharing principle and the dominance of Murabahah-type financing in Malaysia. The community financing nature of Islamic banking provides another possible explanation.

As expected, larger banks have significantly lower credit risk than smaller banks, as denoted by the highly significantly negative coeffi-

<table>
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<th>Table 3. Tests of Difference in Bank Risks for Banks with and without Islamic Financing</th>
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<tr>
<td>Frequency</td>
</tr>
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<td>-----------</td>
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<tr>
<td>Panel A: Credit risk</td>
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<tr>
<td>ISLAM = 1</td>
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<tr>
<td>ISLAM = 0</td>
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<td>Panel B: Interest-rate risk</td>
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<tr>
<td>ISLAM = 1</td>
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<tr>
<td>ISLAM = 0</td>
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<tr>
<td>Panel C: Liquidity risk</td>
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<tr>
<td>ISLAM = 1</td>
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<tr>
<td>ISLAM = 0</td>
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* and ** denote significance at the 0.05 and 0.01 level (one-tailed) respectively.

ISLAM = 1 if Islamic financing facilities are provided by the bank, and ISLAM = 0 if such facilities are not available.
cient on TASSETS. One possible explanation for this result is the ability of larger banks to diversify their asset portfolios better than smaller banks. Contrary to our expectations, no significant relationship is found between the use of derivative contracts and credit risk. The ratio of documentary credits to total assets and the extent of securitization are also not significant explanatory variables of the credit risk of Malaysian banks.

The second regression in Table 4 examines the various determinants of interest-rate risk of Malaysian banks. As hypothesized, the estimated coefficient for ISLAM is significantly positive, as previously observed in the univariate results. Although Islamic financing is based on the “interest-free” principle, our results suggest that banks with Islamic financing facilities in place have higher interest-rate risk. This may be due to the strong focus of Islamic finance on short-term financing. Our results echo Al-Harran’s (2000) concern about the widening of the financial gap between short-term financing (through Murabahah and Mudharabah) and long-term financing (through Musharakah).

Table 4. Multiple OLS Regressions on the Relations between the Three Bank Risks and Their Various Determinants

<table>
<thead>
<tr>
<th></th>
<th>Credit Risk</th>
<th>Interest-Rate Risk</th>
<th>Liquidity Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISLAM</td>
<td>-0.048**</td>
<td>0.135**</td>
<td>-0.053**</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.050)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>DER</td>
<td>-0.014</td>
<td>-0.161</td>
<td>0.177**</td>
</tr>
<tr>
<td></td>
<td>(0.050)</td>
<td>(0.119)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>DOC</td>
<td>0.062</td>
<td>0.225</td>
<td>-0.188**</td>
</tr>
<tr>
<td></td>
<td>(0.181)</td>
<td>(0.245)</td>
<td>(0.064)</td>
</tr>
<tr>
<td>LNSL</td>
<td>0.132</td>
<td>7.078**</td>
<td>-1.240**</td>
</tr>
<tr>
<td></td>
<td>(0.466)</td>
<td>(0.946)</td>
<td>(0.401)</td>
</tr>
<tr>
<td>LOANVOL</td>
<td></td>
<td></td>
<td>0.117**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.041)</td>
</tr>
<tr>
<td>CAPITAL</td>
<td></td>
<td></td>
<td>0.360**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.042)</td>
</tr>
<tr>
<td>TASSETS</td>
<td>-0.009*</td>
<td>-0.068**</td>
<td>0.018**</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.015)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.290**</td>
<td>2.126**</td>
<td>-0.284</td>
</tr>
<tr>
<td></td>
<td>(0.109)</td>
<td>(0.323)</td>
<td>(0.187)</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.058</td>
<td>0.203</td>
<td>0.153</td>
</tr>
</tbody>
</table>

* and ** denote coefficients significant at the 0.05, 0.01, and 0.001 level (one-tailed), respectively.

Credit risk is measured as the allowance for loan losses divided by total assets; interest-rate risk is proxied by GAP, the dollar value of assets minus liabilities that are to be repriced within a year divided by total capital; liquidity risk is proxied by the ratio of liquid assets to total liabilities.

The independent variables are DER, the ratio of derivative contracts to total assets; DOC, the ratio of documentary credits to total capital; LNSL, the ratio of loans sales to total assets; LOANVOL, the standard deviation of loans divided by the average total assets; CAPITAL, the book value of equity divided by total assets; TASSETS is the natural logarithm of total assets; and ISLAM takes a value of one for banks that have Islamic financing and zero otherwise. Standard errors from White’s (1980) correction for heteroskedasticity in residuals are reported in parentheses.
LNSL has a significantly positive coefficient, implying that the higher the proportion of mortgage loans sold to Cagamas, the higher the interest-rate risk. This result is contrary to our prediction and past evidence. We offer one possible explanation for it. We propose that to the extent that banks with Islamic financing have significantly higher loan sales (LNSL) than those without (Table 2), the significantly positive relationship between LNSL and interest-rate risk may be driven by Islamic financing.

Interest-rate risk decreases significantly with bank size, as indicated by the negative estimated coefficient on TASSETS. This is in line with our conjecture and the evidence in Angbazo (1997).

Liquidity risk is examined in the third regression. As expected, we find a significantly negative coefficient on ISLAM, implying that Malaysian banks that offer Islamic financing have lower liquidity risk than those without such a financing scheme. As hypothesized, this may be due to the unique institutional banking framework in Malaysia: (1) increased flexibility in liquid asset-holding requirements for Islamic banks vis-à-vis conventional banks; (2) the establishment of the Islamic Money Market; and (3) unlike most other countries, Islamic banks in Malaysia are able to seek temporary financial accommodation from the central bank in the event of liquidity problems.

All the control variables are significant in explaining cross-sectional differences in the liquidity of Malaysian banks. First, the results show that not all forms of off-balance-sheet contracts reduce the liquidity risk of banks. Consistent with our expectation and Angbazo (1997), derivative contracts (DER) significantly increase liquidity risk. However, the issue of documentary credits (DOC) significantly reduces it. As expected, the proportion of mortgage loans sold to Cagamas (LNSL) significantly reduces liquidity risk. Presumably, this is due to the proceeds received from selling loans to Cagamas. Consistent with previous studies (Dennis & Suriawinata, 1996), we find that liquidity risk is significantly and positively related to the volatility of loans (LOANVOL). Banks with a higher ratio of equity to total assets (CAPITAL) and greater asset base (TASSETS) also have significantly higher liquidity risk.

**SUMMARY AND CONCLUSIONS**

The Malaysian banking system is unique in that it has both the conventional and the Islamic interest-free mechanisms operating side by
side. This study therefore contributes to the vast literature on bank-risk determinants by testing the generality of previous empirical findings with respect to a country that possesses a dual banking structure. More importantly, it provides evidence on the relationship between Islamic financing and bank risk.

Using a sample of 23 commercial banks in Malaysia for the period 1988–1996, we find that commercial banks in Malaysia with Islamic financing have significantly lower credit and liquidity risks but significantly higher interest-rate risk than banks without Islamic financing. Our results also show that bank size is a significant determinant of credit risk. The proportion of loan sales to total liabilities and bank size can explain differences in interest-rate risk across banks. Off-balance-sheet financing (derivative contracts and documentary credits), the extent of securitization, loan volatility, bank capital, and bank size are significant determinants of liquidity risk of Malaysian banks.

The Islamic market is a growing international niche market. To remain competitive, it is important for Islamic banks to find out what their risks are, control them, and monitor them routinely. Insofar as our proxies have satisfactorily captured the three bank risks, our results suggest that interest-rate risk management should be of concern to the Malaysian Islamic banking system.

ACKNOWLEDGMENT

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NOTES

1. For example, a recent special issue of Thunderbird International Business Review (Vol. 41, No. 4–5, 1999) was entirely devoted to Islamic banking.

2. Murabahah, traditionally the most common structure used by Islamic financiers, involves the provision of funds, usually on a short-term basis, to finance the purchase of goods. Mudarabah is akin to funds management. An investor who is looking for an outlet for funds will join forces with someone who has a business opportunity that needs funding. Ijarah is the Islamic term for leasing and is the instrument that is most compatible with conventional financial structures. Musharakah is an agreement between two people to cooperate in a business deal, although it can take on the more specific connotation of venture capital in which a group of investors join together to fund a project and receive a return related to the performance of the project. Bay’al-Salam is a sale contract in which the price is paid at the time of contracting but the delivery of the goods sold takes place at a future date. See Ariff (1998) and Hamwi and Aylward (1999).
3. Jafri and Margolis (1999) provide an explanation for the concept of interest-free banking.

4. The first revelation (Chapter 30, v. 39) emphasizes that interest deprives the wealth of God’s blessings. The second revelation (Chapter 4, v. 160–161) condemns it, placing interest in juxtaposition with wrongful appropriation of property belonging to others. The third revelation (Chapter 3, v. 130) enjoins Muslims to stay clear of interest for the sake of their own welfare, and the fourth revelation (Chapter 2, v. 275–279) establishes a clear distinction between interest and trade, urging Muslims to take only the principal sum and to even forgo this sum if the borrower is unable to repay. We are grateful to Effiezal Aswadi Bin Abdul Wahab and the referee for this information.

5. Some of these reasons include interest, being a predetermined cost of production, tends to prevent full employment; international monetary crises are due largely to the institution of interest and the fact that trade cycles are in no small measure attributable to the phenomenon of interest; and interest is not very effective as a monetary policy instrument even in capitalist economies. See Ariff (1998).

6. The nominal gross national product declined by an unprecedented RM7.8 billion in two years (Dynaquest, 1995).

7. After coming close to collapse under the weight of RM2.26 billion in loans to the Carnion Group and other Hong Kong property speculators in 1984, Bank Bumiputra reported a substantial loss of RM1.04 billion in 1989. This huge loss wrote off, for the second time in five years, all of its shareholder funds (Dynaquest, 1995).

8. The conventional lending relationship between the banker and its depositors is replaced with a partnership type of cooperation in Islamic financing. In the real sense, this implies that the Islamic banks’ exposure is to equity rather than loan risk. However, this study uses the phrase “credit risk” in keeping with the literature.

9. We thank Yahia Abdul-Rahman for pointing this out to us.

10. “Allowance” is the sum of beginning balance of allowances, recoveries, provisions, and adjustments minus bad loans written off. We also proxy credit risk by the proportion of loan-loss provision to total assets. Although not reported, less significant results are obtained using this proxy.

11. Off-balance-sheet activities have grown substantially within the commercial banking system in Malaysia. By the end of 1996, the notional value of off-balance-sheet liabilities was RM150 billion, compared to RM66.6 billion on balance-sheet liabilities.

12. Guarantees are also one of the largest contingent liabilities disclosed in the annual reports of Malaysian commercial banks. Due to the requirements needed in order to access a Bankers Guarantee, the banks’ exposure to credit risk through guarantees are minimized if not removed.

13. Cagamas commenced its operations in October 1987 with the purchase of RM110 million in housing loans from commercial banks and an issue of RM100 million in mortgage bonds. As of October 31, 1997, these figures amounted to RM21.0 billion and RM20.4 billion, respectively.

14. Following Madura and Zarruk (1995) and Wright and Houpt (1996), we also measure interest-rate risk by GAP plus the ratio of interest expenses to total assets. This is because the impact of interest rates on commercial banks depends not only on the mismatch of rate-sensitive assets and liabilities, but also on the proportion of funding obtained in the form of market-determined deposit accounts. Although not reported, the results for this proxy are almost identical to those reported in this article.

15. There are two further reasons for expecting this relationship. First, Cagamas securities have been given the highest rating by the Rating Agency Malaysia Berhad and the Malaysian Rating Corporation Berhad. This allows Cagamas to borrow large sums of medium- and long-term funds in the capital market at a reasonably low cost. These funds are then made available to commercial banks, which would otherwise fund their loans using shorter-term deposits. By having access to longer-term funds, commercial banks can match the tenor of their long-term mortgage more closely and thus reduce the extent of maturity mismatch. Second, the availability of floating-rate, convertible-rate, and fixed-rate facilities from Cagamas provide commercial banks with an additional flexibility and instrument to manage their interest-rate risk.

16. For robustness, we also proxy liquidity risk by the ratio of total deposits to total loans, as used in Dennis and Suriawinata. Our results using this proxy are less significant than those reported in this article.

17. The correlation between LOANVOL and DEPVOL is high (the correlation coefficient is 0.87). To overcome the problem of multicollinearity in our data, we use each of these volatility measures in turn in our tests. Not surprisingly, the results are generally robust to either of the variables used.
18. Since the data are pooled over nine years, we indexed all dollar values for inflation to the 1996 value. We chose the Consumer Price Index, obtained online from the Bank Negara Malaysia’s Web site at www.bnm.gov.my, for this purpose.

19. As noted earlier, the information obtained is not detailed enough to allow us to differentiate banks by the extent and type of Islamic financing facilities provided.

20. Note that the sample size is smaller in Panels B and C, as we could not compute the proxies for interest-rate and liquidity risks for four firms due to data unavailability.

21. Although not reported in the article, the Pearson correlation matrix shows that multicollinearity is not a problem in our data.

REFERENCES


