



SECTION 1

**RISK MANAGEMENT OF ISLAMIC BANKS: A
SEARCH FOR EMPIRICAL EVIDENCES**

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Abstract

The objectives of this study are to determine 1) the effect of global economic and financial crisis on risk management, 2) the severity of different types of risk facing Islamic banks, 3) the risk levels of Islamic financial modes, 4) risk assessment techniques, and 5) risk management techniques. The structure of the balance sheet, the nature of Islamic finance instruments and funding sources have a great impact on the level of risk exposure of banks and the instruments. Credit risk is found to be the most serious risk, followed by liquidity risk, market risk and operational risk, in descending order of importance. As for the riskiness of Islamic financing modes, mudarabah is perceived to be the riskiest, followed by musharakah, while murabahah ranked as the least risky mode. Moreover, Islamic banks are found to use traditional risk management techniques more than sophisticated measurements. They also adopt risk mitigation techniques that are used by conventional banks in preference to techniques that are considered to be unique to Islamic banks. This paper is the first to study the risk management practices of Islamic banks operating in Bahrain. It also provides evidence about these practices after the global financial crisis that affected all countries, including Bahrain.

Keywords: Bahrain, Islamic Banking, Islamic Modes of Finance, Risk Management

JEL Classification: E58, G01, G20, G32, G39

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1. INTRODUCTION

Banking regulators play a vital role in enforcing regulations related to risk management on the part of the institutions they regulate. They always stress the importance of appropriate and effective risk management. Regulators are motivated by the fact that banks may overlook risk exposure in their attempt to increase their profits, and devastating consequences can result from the failure to manage risks effectively (Basel Committee on Banking Supervision, 2004). Banks are expected to use reliable risk measures to allocate resources among activities with the best risk/rewards ratios. Risk management is an integral part of managing financial institutions, as a bank's survival depends how it manages its risk exposure. The importance of risk has increased significantly since 2008 as a direct consequence of the global financial crisis. The decision of the Basel Committee on Banking Supervision of the Bank for International Settlements to replace the Basel Capital Accord

introduced in 1988 (known as Basel I), which became effective by the end of 1992 with Basel II in 2004, came as a response to the need to strengthen risk management practices in the banking industry, while Basel III will be fully implemented by 2019. Basel II and III frameworks have three pillars: 1) minimum capital requirements, 2) supervisory review of an institution's internal assessment process and capital adequacy, and 3) effective use of disclosure to strengthen market discipline as a complement to supervisory efforts. Banks operating in Bahrain have been required to comply with Basel II requirements since January 2008. In response to the 2008 economic and financial crisis, the Bank for International Settlements (BIS) issued Basel III. The new accord, which will become fully effective in 2019, requires banks 1) to increase the capital asset ratio from 8%, as it is stipulated in Basel II to 10.5%, which includes conservation and countercyclical capital buffers; 2) introduces a minimum 3% non-risk leverage ratio that covers also off-balance sheet exposures; 3) enhances the supervisory review

process for firm-wide risk management and capital planning; and 4) introduces two minimum liquidity ratios: liquidity coverage ratio (LCR) and net stable funding ration (NSFR). The LCR covers the entire statement of financial position and addresses banks' need to hold high-quality liquid assets cover the total net cash flow, while NSFR aims at addressing the need for banks to have stable sources of funding and to deal with liquidity mismatches (Basel Committee on Banking Supervision, 2012).

Since Basel II does not take into consideration the uniqueness of the investment and liabilities of Islamic banks, the Islamic Financial Services Board (IFSB) issued two standards: IFSB-1 "Guiding Principles of Risk Management for Institutions (other than Insurance Institutions) offering only Islamic Financial Services (IFS) and IFSB-2 "Capital Adequacy Standard for Institutions (other than Insurance Institutions) offering only IFS." The Central Bank of Bahrain (CBB) adopted these standards along with Basel II in its rulebook for the risk management of Islamic banks.

Bahrain has a dual banking system because it allows conventional and Islamic banks to operate. The history of conventional banking can be traced back to 1918 and the establishment of the East Bank while the first Islamic bank, the Islamic Bank of Bahrain, was established in 1979. The sector includes 103 banks of both retail and wholesale banks. At the end of June 2015, there were 28¹ retail banks, 13 of which were locally incorporated and 15 were branches of foreign banks. Furthermore, there were 75 wholesale banks. Of these 103 banks, 23 banks operate on the basis of Islamic sharia'a principles. According to (Thomson Reuters and Dinar Standards 2015) Bahrain maintain its leadership position as the second after Malaysia in the Islamic Finance indicator ranking. As of the end of June 2015, the total assets of the banking sector in Bahrain were US\$189.59 billion, of which Islamic banks held US\$25.56 billion (13.48% of total banking assets) (CBB, 2015). During this period, the assets of managed all banks contracted, while the assets were managed by Islamic banks increased. Islamic banking profit exceeded \$10 billion in 2013 and is expected to reach \$37 billion in 2019 (Ernst and Young, 2014).

Theoretically, Islamic banks are based on offering banking products based on the principal of risk and profit sharing with their clients. As such, they are not merely financial intermediaries between borrowers and lenders like conventional banks. Hence, although both types of banks appear similar, theoretically they are not because of the risks that are part of their unique business model. Hence, from a theoretical perspective, risks faced by Islamic banks are not identical to the types of risks that conventional banks face. Therefore, studying risk management in conventional banks may not be generalized to Islamic banks.

Despite the importance of risk management in Islamic banks, there are very few published theoretical and empirical studies on the subject (Khan, 1997, Khan and Ahmed, 2001, Hassan, 2003, Muljawan et al., 2004, Akkizidis and Khandelwal, 2007, Khan and Bhatti, 2008, Hassan, 2009).

Furthermore, studies of the risk management practices of Islamic banks are also very limited (Khan, 1997, Hassan, 2003, Muljawan et al., 2004, Akkizidis and Khandelwal, 2007, Khan and Bhatti, 2008, Ariffin et al., 2009, Hassan, 2009, Abu Hussain and Al-Ajmi, 2012). Furthermore, it has been argued that regulatory economic and regulatory environments, including sharia'a interpretations, play important roles in shaping the risk management practices of Islamic banks (Abu Hussain and Al-Ajmi 2012 and Abdulla et al., 2015). Lack of standardization of products and services is one of the reasons for such findings and this argument. The present study aims to provide new evidence of some aspects of risk management of Islamic banks from Bahrain, a country which has attracted little attention despite its importance in Islamic finance. Specifically, the study aims to identify the types of risk Islamic banks face, the types and level of risk facing the Islamic mode of financing, and the risk identification techniques and risk mitigation techniques that are employed. Khan and Ahmed (2001) and Ariffin et al., (2009) provide conflicting evidence regarding the riskiness of Islamic financing modes and risk management practices. This study aims to provide fresh evidence in this respect. It also provides evidence of risk management practices during financial crises, as the key cause of the current crisis was the fundamental combination of aggressive lending and inadequate risk management, thus leading to a breakdown in confidence between parties (Venardos, 2010). In addition to its contribution to the literature of risk management, the study has important policy implications, because it provides information for regulators, shareholders, management and other stakeholders that they can use when making policy decisions.

The paper is organized as follows. In the next section, we review the relevant literature. In Section 3, we formulate the issues discussed within the study, describe how they are tackled, and describe the sample characteristics. In Section 4, we provide the results. The last section summarizes and concludes the paper.

2. A BRIEF LITERATURE REVIEW

Risk, in the banking context, may be defined as a reduction in a firm's value due to changes in the business environment and inability to meet its obligations. Banks and similar financial institutions face different types of risk. According to Basel II and III frameworks, the most important risk areas are 1) market risk, which is the change in net asset value due to changes in underlying economic factors such as interest rates, exchange rates, and equity and commodity prices; 2) credit risk, which is the change in the net asset value due to changes the perceived ability of the counterparty to meet their contractual obligations; and 3) operational risk, which is defined as the risk of loss resulting from inadequate or failed internal processes or systems or from external events. Risk is inherent in all banking activities and can never be eliminated entirely. However, shareholder value can be preserved and enhanced by managing, mitigating and, in some cases, insuring against risk. These three types of risk encompass all types of risk that are encountered by conventional

¹ The number of retail banks will go down to 27 after the completion of the takeover of BMI by Alslam bank in the second half of 2015.

banks and parts of the risk faced by Islamic banks. Basel II and III frameworks provide a clear methodology for quantifying credit, market and operational risk.

In a study by the (Basel Committee on Banking Supervision, 2004) of 13 cases of banking failure in 8 countries, credit risk is the most common factor that explains the crisis, followed by operational risk and market risk. Basel II provides mechanisms for quantifying these risks and calculating the minimum capital requirement. Al-Tamimi and Al-Mazrooei (2007) report that the most important type of risk faced by banks in the United Arab of Emirates (UAE) is foreign-exchange risk, followed by credit risk and operational risk. These results are similar to those reported by Hassan (2009) in the study of risk management practices of Islamic banks in Brunei. Al-Tamimi and Al-Mazrooei (2007) also report that banks manage risk effectively, and locally incorporated and foreign banks in the UAE differ in their practices of risk assessment and analysis.

Studies of risk management of Islamic banks (Khan, 1997, Khan and Ahmed, 2001, Hassan, 2003, Muljawan et al., 2004, Khan and Bhatti, 2008, Ariffin et al., 2009, Hassan, 2009; Abu Hussain and Al-Ajmi 2012, among others) argue that Islamic banks face additional risks that are not faced by conventional banks. Archer and Karim, 2007 postulate that Islamic banks' products tend to be more complex than those of conventional banks. The distinctive types of risk faced by Islamic banks are dictated by the way they conduct their business. These risks are related to the nature of the assets that Islamic banks deal with and their liability structure. In Islamic finance, unlike conventional finance, there is no direct lending of cash for the return of a higher amount of cash², unless the transaction is asset backed, implying that the transaction has to involve the sale and purchase of an asset. In a typical financing transaction, the Islamic bank will purchase assets that the borrower wants financed at one price and sell them to the borrower at an agreed-upon (higher) price, allowing the bank to make a profit. This purchase and sale of an asset makes the financing Sharia'a-compliant. It can be deduced that Islamic banks need a deeper understanding of a borrower and his or her business to be able to minimize the risk that a client will default on purchasing the asset underlying a financial transaction. Such transactions are interest free and based on profit and loss sharing between clients and depositors.

Second, deposits in Islamic banks are provided mainly by depositors on the basis of profit and loss sharing. Depositors are investment account holders (IAHs). The accounts held are called profit sharing investment accounts (PSIA) and equity investment accounts. The relationship between the depositor (*rab ul mall*) and the bank (*mudarib*) is a partnership in which the *rab ul mall* provides the capital and the *mudarib* provides the management, effort and time. The Islamic bank plays the role of *rab ul mall* when it provides a capital to entrepreneurs. The *rab ul mall* is a sleeping partner in the partnership because he or she cannot take part in the management. The liability of the *rab ul mall* is limited to his or her

investment, unless the *mudarib* is authorized to incur debt on his or her behalf. In theory, IAHs, unlike depositors in conventional banks, are not guaranteed a certain rate of return, because such a promise is considered to be *riba*.³ The rate of return on deposits depends on the profit banks earned from investing those deposits, as dictated by the profit and risk sharing core principal of Islamic finance. However, in reality, Islamic banks indirectly promise depositors, without legal obligation, to receive a certain profit rate presented to depositors as an expected return. Hence, the return depends on the performance of the investment financed by depositors and the bank's share in the profit. Therefore, one would expect not only fluctuations in the rate of return but also that depositors may lose all their money, provided that losses are not the result of misconduct and/or negligence on the part of the bank. This situation leads to another risk, i.e., rate of return risk, faced by Islamic banks. Rate of return risk is the potential impact of the mismatch between the rate of return on assets and the expected rate of return of the sources of funding. Most of the assets and liabilities of Islamic banks are short term in nature, except for certain long-term liabilities that have been utilized to fund the Islamic bank's strategic investments in its associates. However, in practice, Islamic banks smooth the rate of return on deposits by creating two types of reserves: 1) profit equalization reserves (PER) and 2) investment risk reserve (IRR). PER is the amount appropriated out of gross income from assets, before allocating the bank's (*mudarib's*) share, in order to smooth the returns paid to IAHs and shareholders, but it may not be used to cover losses. IRR is the amount appropriated out of IAHs' income after the deduction of the *mudarib's* share of income in order to cover any future losses on investments financed by PSIA. These two reserves are used by Islamic banks to reduce displaced commercial risk (DCR). The DCR refers to the risk transferred to shareholders in order to cushion the IAHs from carrying some or all of the risk (e.g. credit and market risk) to which they are contractually exposed in a *mudarabah* contract⁴. This risk is a category of the rate of return risk. Furthermore, unlike deposits with conventional banks, balances in the PSIAs do not enjoy protection from insurance deposits.⁵ If PER and IRR are sufficient to manage the payout to IAHs, shareholders profits will not be sacrificed in favor of maintaining PSIA's return.

Third, risk arises from the failure to comply with the sharia'a rules and principles (Lahsasna 2014). This risk may lead to invalidation of contracts, and a loss of income generated from investment in non-sharia'a compliant activities, because, according to sharia'a, any income generated from such investment should be donated to charities. The non-financial impact of this risk may

2 Islamic sharia'a law allows cash to be lent, but generally only as Qard Hassan, where only the same amount of cash must be returned.

3 Riba is an Arabic word that means excess or interest. Islamic sharia'a prohibits Muslims from paying or receiving riba, so Islamic banks do not charge clients interest and do not promise depositors interest on their investment, i.e., deposits.

4 A contract between IAHs as a *rab ul mal* and the bank as a *Mudarib*. More information can be found in Usmani . (2002).

5 Since 1993, deposits with conventional banks are insured up to 75 percent of their value or BD20,000, whichever is less.

include threatening the bank's reparation as Islamic bank and violation of banking regulations.

Fourth, there are counterparty and corporate governance risks. The latter is due to the role of sharia'a supervisory boards (SSBs) in the approval process of products and services and their relationship with management. Given these differences, one would expect that there are some differences between risk management practices of conventional and Islamic banks. The SSBs are entrusted with the task of evaluating any products and services to determine their compliance with Islamic sharia'a before offering them to the banks' clients and also to oversee the implementation and compliance at every stage. This role may raise corporate governance issues, because the success of the banks depends on the approval of the products by the SSBs, while members of the SSBs are paid by the banks. Some authors argue that there is a chance that SSBs might approve products that do not meet the sharia'a requirements. For example, Mufti Muhammad Taqi Usmani, who is a prominent scholar and the president of the Sharia'a Council of the Bahrain-based Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), said that 85 per cent of the current Sukuk⁶ structures were not Islamic, as reported in Reuters (2007). However, global sukuk issues (companies and governments) jumped from around \$33.5 billion in 2009 to nearly \$110 billion in 2014 and is expected to reach \$196 billion in 2020. The outstanding global sukuk is estimated to be round \$241 billion at the end of 2014 and is expected to reach \$907 billion by the end of 2020 (Thomson Reuters: Zawya, 2014).

Fifth, unlike conventional banks, central banks do not play the role of lender of last resort (LOLR) for Islamic banks, because central banks cannot provide funds on a basis other than interest lending. Since Islamic banks cannot pay interest, they are left without an LOLR, and hence they are left to provide self-insurance. This function is provided by IRR. Lack of an LOLR, limited number of Islamically acceptable short-term financial instruments and the absence of an adequate money market may force Islamic banks to maintain higher liquidity than conventional banks to mitigate liquidity risk.

Finally, Islamic banks face a serious challenge in managing their risk exposure because of lack of sharia'a-compliant derivatives to hedge against those risks. In March 2010, the International Swaps and Derivatives Association (ISDA) and International Islamic Financial Market (IIFM) jointly issued the first sharia'a-compliant master agreement for over-the-counter (OTC) derivatives. The Ta'Hawwut (hedging) Agreement is therefore expected to be used as a reference for market participants where they or their customers need to hedge risks in line with sharia'a principles. However, it remains to be seen whether this opening will be accepted by the industry because 1) many Islamic financing modes are not standardized; 2) for implementation, the agreement must be approved by the bank's SSB; 3) the agreement provides for the election of New York law or the law of England and Wales as the governing

secular law for the Ta'Hawwut Agreement; and 4) according to the agreement, determination of unlawfulness or illegality is made without reference to sharia'a law. This means that termination events under section 5(b)(i) (illegality) or section 5(b)(iii)(2) (tax event - change of tax law) will be determined without regard to sharia'a principles.

Khan and Ahmed (2001), Ariffin et al., (2009), and Abu Hussain and Al-Ajmi (2012) are the only published studies that attempt to shed light on risk management practices of Islamic banks operating in Bahrain. The first two investigated, among other things, the importance of different types of risk facing Islamic banks in a number of countries, including Bahrain. In both studies, risk managers of Islamic banks from different countries, including Bahrain, were surveyed regarding their perception of the types of risk facing Islamic banks, the types of risk of Islamic financing modes, risk measurement, and risk management techniques. The two studies report different levels of importance for the types of risk facing Islamic banks, and they differ in their findings in relation to the risk levels of the financing modes. Abu Hussain and Al-Ajmi (2012) report that risk management practices of conventional and Islamic banks operating in Bahrain are not significantly different. They also found that Islamic banks are found to be significantly different from their conventional counterparts in understanding risk and risk management and the level of risk. Furthermore, Abdulla et al. (2015), who investigate corporate risk disclosure in the Gulf Cooperation Council countries, report that the level of disclosure of conventional banks is significantly lower than that of Islamic banks. These results contradict the theoretical expectations that suggest that Islamic banks face higher agency problems (Athari et al., 2016) because of the nature of the contractual relationships with the depositors, and hence are likely to disclose more information compared with conventional banks. Depositors (IAH) of Islamic banks, unlike those of conventional banks, entrust banks to manage their deposits on the same basis of managing shareholders' funds, hence they expose their investment to the same level of risk of shareholders, as such depositors are considered to be quasi-equity holders. However, IAHs of Islamic banks do not have the same rights shareholders enjoy, such as attending general meetings and voting. Agency theory predicts that increasing disclosure will reduce information asymmetry and hence will mitigate agency problems.

3. RESEARCH DESIGN AND THE SAMPLE CHARACTERISTICS

This is a cross-sectional study of the risk management practices in the banking industry. The target population of this study is staff members of Islamic banking institutions operating in Bahrain. A questionnaire was used to collect information for the study. Based on the literature review, the following questions are addressed:

1. How do Islamic bankers perceive the effect of the current economic and financial crisis on banks' risk management?
2. How do Islamic bankers perceive the relative seriousness of the different types of risk they face?

⁶ Islamic bonds, or sukuk, are underpinned by physical assets whose returns are used to pay bond-holders, to account for Islam's prohibition of interest.)

3. How do Islamic bankers perceive the types of risk pertaining to the mode of finance offered by Islamic banks?
4. What types of risk measures are used by Islamic banks in Bahrain?
5. What risk mitigation techniques are used by Islamic banks?

To address the above questions, a questionnaire was developed after reviewing the relevant literature. A modified version of the questionnaire of Khan and Ahmed (2001) and Ariffin et al., (2009) is used. Before sending it to the target population (banks staff), 20 academics and practitioners were asked to comment on it. Their comments were incorporated in the final version of the questionnaire. This version is divided into two parts: Part I solicits information about the respondents and the banks, and Part II includes six questions. The first question seeks the respondents' opinion with regard to the effect of the recent economic and financial crisis on the level of risk facing Islamic banks. The second question solicits the respondents' opinion of the level of seriousness of eight different types of risk facing Islamic banks, using a 5-point Likert scale ranging from 5 (very serious) to 1 (not serious at all). The third question asks respondents to identify the seriousness of different types of risk facing eight Islamic financing modes. The fourth question asks respondents to rate the level of seriousness of five issues of risk faced by Islamic banks. The fifth question identifies

the risk management techniques used by Islamic banks, and the sixth question determines the risk management techniques adopted by Islamic banks. The survey was administered during February and April 2015.

Of the 600 questionnaires distributed, 421 useful questionnaires were returned, representing a response rate of 70.19 per cent. To test for non-response bias, we compared the results of the first 30 and the last 30 questionnaires received. The t-statistic is used to compare the mean responses to all statements, risk types, and risk identification methods/approaches. The results (not reported to conserve space) show no significant differences between the mean responses of the two sets of questionnaires. We tested the reliability of the instrument using Cronbach's α , which was 81.4 per cent and indicates a high level of internal consistency.

The characteristics of the respondents and the banks they work for are shown in Table 1. The majority (60.8 percent) of the respondents are men, and 53 percent of the respondents have banking experience of more than 5 years. More than 60 percent of the respondents occupy middle management and managerial positions. The respondents work in a variety of departments; the largest group works in operations, followed by credit, finance, audit and risk. The majority of respondents hold graduate and/or professional qualifications in accounting, finance and risk management. Eighty-two percent of the respondents work for retail Islamic banks. The majority of the respondents work for locally incorporated banks.

Table 1. Characteristics of the Sample

Attributes	Frequency	Percent
Gender		
Female	165	39.2
Male	256	60.8
Length of Experience		
Less than 5 years	198	47.0
Five years or more but less than 10 years	143	34.0
Ten years or longer	80	19.0
Position		
Executive/Managerial	112	26.6
Middle Management	141	33.5
Other	168	39.9
Type of Job		
Audit	55	13.1
Credit	74	17.6
Finance	73	17.3
Investment	28	6.7
IT	22	5.2
Operations	92	21.9
Risk	53	12.6
Treasury	24	5.7
Highest Qualification		
BSc	236	56.1
Professional (Accounting, Finance)	59	14.0
Graduate degree	56	13.3
Risk management professional qualification	22	5.2
Other	48	11.4
Type of License		
Retail Islamic	166	31.7
Wholesale conventional	100	19.1
My banks		
Local	346	82.2
Foreign	75	17.8

4. RESULTS AND DISCUSSIONS

The bankers were asked to state their opinion of the effect of the latest global economic and financial crisis on risk management practices. All respondents indicated that the crisis has some influence on the way risk is dealt with by Islamic banks. These results are in line with the observation that the crisis played a role in attracting more attention to risk management and practices. This is because bank collapse is the result of risk management failure. However, these results do not indicate whether banks give the same level of attention to risk management, or they revert back to the attention level that they gave to risk management before the crisis.

Table 2 reports the descriptive statistics of the seriousness of the types of risk Islamic banks are exposed to. The mean ranges between 4.20 and 3.02. The relative importance of the types of risk found are higher than those reported by (Khan and Ahmed, 2001) but lower than the results reported by Ariffin et al. (2009). As expected, credit risk is perceived to be the most important risk. This confirms the results of Ariffin et al. (2009) and Abu Hussain and Al-Ajmi (2012). However, Khan and Ahmed, 2001 report that credit risk is only the fourth most important risk facing Islamic banks. Commercial displacement risk⁷, which is a unique risk to Islamic banks, came second in terms of importance, with a mean of 4.08. Liquidity risk is perceived as the third most important risk. This result contradicts that of Ariffin et al. (2009) but is similar to that of Abu Hussain and Al-Ajmi (2012). Operational risk was found to be the fourth most serious risk faced by banks. In their survey of banks in Bahrain, Ariffin et al. (2009) report that this risk is the least important type of risk among the seven types of risk included in their survey, but banks of other countries attach more importance to this risk. These results are not in line with the emphasis placed on such risk in Basel II, which banks in Bahrain had to comply with after January 2008. Rate of return risk and sharia'a non-compliance risk are ranked fifth and sixth in importance by the bankers, respectively. These findings are somewhat different from those reported by Ariffin et al. (2009) who found that banks in Bahrain perceived these two types of risk as the fourth most important type, after credit risk, foreign exchange risk, and liquidity risk. Furthermore, the mean rating of these two types of risk are lower than that reported by Ariffin et al., (2009). Our results and those of Khan and Ahmed (2001) and Ariffin et al. (2009) may differ because of the time when the studies were conducted, as the perceptions of bankers are influenced by the practices during the time in which the data was collected. The sample used by Khan and Ahmed (2001) and 6 by Ariffin et al. (2009) were very small (7 and 6 respectively), while our results are based on 421 respondents.

Table 3 presents a summary (mean values and standard deviation) of the risk perceptions for different modes of financing offered by Islamic banks. The results show that Islamic bankers

perceive mudarabah, musharakah⁸, istisna'a⁹ and salam¹⁰ as the most risky modes of financing with mean values of 3.96, 3.93, 3.82 and 3.70, respectively.

Table 2. Descriptive statistics for each type of risk

Types of Risk	Mean	Standard deviation	Skewness	Chi-square Significance level
Credit risk	4.20	0.796	- 0.634	0.000
Commercial displacement risk	4.08	0.815	-0.724	0.000
Liquidity risk	3.90	1.037	- 0.687	0.000
Market risk	3.63	1.053	- 0.099	0.000
Operation risk	3.62	1.034	- 0.084	0.000
Rate of return risk	3.61	0.942	+ 0.019	0.000
Sharia'a non-compliance risk	3.52	1.066	+ 0.077	0.000
Concentration risk	3.33	1.249	- 0.226	0.000
Reputation risk	3.19	1.168	- 0.333	0.000
Legal risk	3.02	1.268	- 0.087	0.000

They also believe that murabahah¹¹ is the least risky mode of finance, with a mean rank of 3.51. These findings provide an explanation of why investment in murabahah by Islamic banks represents their largest component of assets. The mean risk of all modes of finance are found to be higher than those reported by Khan and Ahmed (2001). However, they are lower than those reported by Ariffin et al. (2009), with the exception of mudarabah. Furthermore, average credit risk is higher than the other three types of risk, followed by market risk, while operational risk is perceived by the bankers as the least serious risk, with a mean of 3.41. These results provide further evidence of the bankers' opinions about the operational risk facing Islamic banks. However, its relative seriousness is lower than that reported by Ariffin et al. (2009) but higher than that reported by Khan and Ahmed (2001). Market risk is the second most serious risk in the view of the surveyed bankers. The credit risk of mudarabah is considered to be highest, followed by musharakah, while Salam came in the third place,

8 Musharakah is a partnership between an Islamic bank and its clients, whereby both parties contribute to the capital and participate in the management of the partnership. Islamic banks, however, may prefer to be a sleeping partner. Diminishing musharakah is a partnership transaction through which an Islamic Bank and its customer contribute their equity at an agreed-upon ratio for the purchase of equipment/machinery and other tangible assets, and over the life of the contract, the bank sells its equity to its client on agreed-upon terms. (Usmani, 2002).

9 Istisna'a is a contract for manufacturing a product in which the manufacturer agrees to produce a specified product to be delivered at a specified time for a specified price. (Usmani, 2002).

10 Salam is a forward contract that requires payment of the price of the goods made at the time of signing the contract and goods are delivered on the maturity of the contract. The basic purpose of this sale is to meet the needs of the small farmers who need money to grow their crops and to feed their family up to the time of their harvest. The permissibility of Salam is an exception to the general rule that prohibits forward sales. (Usmani, 2002).

11 Murabahah is a particular kind of sale whereby the seller acquires a commodity and then sells it to another person at an express profit or mark-up. Islamic banks generally sell the commodity or assets on credit. (Usmani, 2002).

7 Commercial displacement risk arises from Islamic banks practices to match rate of return on deposits paid by competitors, which may force Islamic banks to absorb losses that should be borne by depositors (investment account holders).

with mean ratings of 4.41, 4.30 and 4.10, respectively. The average credit risk of the financing mode is 4.04, which makes it the most serious risk. These findings are similar to those reported in Table 3, which shows that credit risk is the most serious risk facing Islamic banks. These results are somewhat different from those reported by Ariffin et al. (2009), who found that the most serious credit risk is for Salam, followed by istisna'a and mudarabah, and are also somewhat different from those reported by Khan and Ahmed (2001), who conclude that the credit risk of musharakah, diminishing musharakah, and salam are the highest. Our results show that murabahah has the least credit risk, with a mean value of 3.76. Both Khan and Ahmed (2001) and Ariffin et al. (2009) report similar

results, with mean values of 2.56 and 4.10, respectively. It appears from the results that the profit-loss sharing modes of financing employed by Islamic banks are perceived to have higher credit risk. These observations may explain the composition of the assets of Islamic banks, which shows a preference for murabahah compared with the profit-sharing modes of financing. Mudarabah and musharakah are exposed to the highest rate of return risk, while murabahah is perceived by the bankers to carry the least rate of return risk. Moreover, bankers believe that Salam is exposed to the highest risk of sharia'a non-compliance, followed by murabahah.

Table 3. Perceptions of the risk inherent in different modes of financing

	Stats	Credit Risk	Market Risk	Liquidity Risk	Operational Risk	Rate of return Risk	Sharia'a Risk	Average
Mudarabah (assets side)	Mean	4.41	4.03	3.63	3.65	4.27	3.79	3.96
	SD	0.75	0.75	1.06	0.69	0.81	1.09	0.30
Musharakah	Mean	4.30	4.02	3.83	3.64	4.20	3.76	3.95
	SD	0.77	0.98	0.85	1.09	0.87	0.98	0.24
Salam	Mean	4.10	3.84	3.19	3.48	3.43	4.17	3.70
	SD	0.83	1.10	1.25	0.97	1.08	0.62	0.36
Ijarah Muntahia Biltamleek (financial lease)	Mean	4.08	3.88	3.29	3.02	3.57	3.82	3.61
	SD	0.75	0.87	1.20	1.21	3.26	1.22	0.36
Istisna'	Mean	4.00	3.80	3.78	3.47	4.01	3.87	3.82
	SD	0.85	0.77	0.83	0.66	0.99	0.90	0.18
Ijarah (operating lease)	Mean	3.98	3.91	3.53	3.52	3.46	3.69	3.68
	SD	1.03	0.74	1.02	1.07	1.17	1.05	0.20
Diminishing Musharakah	Mean	3.84	3.52	3.69	3.44	3.65	3.81	3.68
	SD	0.99	0.72	1.09	1.00	1.02	0.92	0.14
Murabahah	Mean	3.76	3.09	3.76	3.04	3.31	4.08	3.51
	SD	1.19	1.21	1.10	1.19	1.02	0.87	0.39
Average		4.06	3.76	3.59	3.41	3.74	3.87	3.74

Note: *Standard deviation

Banks use several risk measurement techniques. Respondents were asked to state whether or not their banks adopt the techniques included in the questionnaire. Panel A of Table 4 summarizes the responses. Maturity matching is used by 85.3 per cent of the banks, followed by gap analysis (80 percent) and credit rating (79.8 percent). Ariffin et al., (2009) report a similar ranking. However, Ariffin et al., (2009) report that these approaches are less widely used. The differences are probably due to the samples used in our study and the other studies. Although the figures indicate that these techniques are popular among Islamic banks, the percentage of the bankers that state that their banks do not use such techniques should raise

questions about their risk management. This is most true for maturity matching, which is the most widely used form for measuring liquidity risk. Around 14.7 per cent state that their banks do not use this risk measurement approach. In general, these banks may not match the funding structure with the maturities of their assets; liabilities have shorter maturities than assets. This is done so that banks can benefit from the return on assets and the cost of funding. The results reported by Khan and Ahmed (2001) show that 41.2 per cent of the banks surveyed do not use maturity matching analysis. Therefore, our results indicate that banks do not measure the liquidity risk more than they did a decade ago.

Table 4. Risk measurement approaches and risk management techniques used by Islamic banks

Panel A		Panel B	
Risk Measurement	Yes (%)	Risk Management Techniques	Yes (%)
Maturity matching	85.3	Collateral arrangement	94.5
Gap analysis	80.0	Loan loss reserves	93.8
Credit Ratings	79.8	Investment risk reserve	87.1
Internal-based rating system	77.4	Profit equalization reserve	85.4
Estimates of worst case/stress tests	70.8	Guarantees	82.2
Risk-adjusted return on capital	47.1	Hamish jediah	74.3
Simulation techniques	39.9	On balance sheet netting	69.1
Duration analysis	36.3	Third-party enhancements	66.0
Earnings at risk	30.6	Urboun (over-the-counter Islamic derivatives)	62.0
Value at risk	25.4	Parallel istisna'a contracts	32.5
		Parallel salam contracts	00.0

The results indicate that Islamic banks in Bahrain do not use sophisticated risk management approaches, with the exception of “estimates of worst case/stress tests,” which are used by 70.8 per cent of the banks. These results are somewhat similar to those of Ariffin et al., (2009). However, the comparison of our results and those of Ariffin et al., (2009) shows that banks are using more sophisticated risk measurement techniques than they were a decade ago. These results indicate that Islamic banks are more willing to benefit from the new development of financial risk management than before and that the development of Islamic banks and their products, as they become more sophisticated, requires them to improve their risk measurement to match the development of the institutions. However, the challenges facing Islamic banks remain great.

Risk assessment and analysis of debtors is based on historical data and forecasts. Such mechanisms allow banks to assess credit and market risks. However, such an analysis cannot assure banks that debtors will honor their commitments or that *mudaribs* will deliver on their promises. This is because history might not repeat itself, and some risk factors may not be accounted for by the banks. The ability of debtors to pay may deteriorate after granting credit, and Islamic banks acting as a *rab ul mall* might lose their investment as a result of misconduct or negligence of the *mudarib*. As a result, banks generally adopt a variety of techniques to mitigate the risks that they face. To identify the techniques adopted by Islamic banks, respondents were asked to state whether or not their banks employ a list of risk mitigation techniques. Table 4 Panel B presents the frequencies of the risk mitigation techniques used by Islamic banks.

Unlike conventional banks, Islamic banks have a limited number of risk mitigation techniques because there are few sharia'a-compliant derivatives. Among the techniques that are widely used by Islamic banks, collateral arrangements are used by 92.9 percent, followed by loan loss reserve, which is used by 82.2 percent. The likely reason for the collateral to be widely used is the high credit risk to which banks are exposed which result from the credit they extend to clients through *murabahah* and *ijarah*. These facilities represent 67 percent of the funds provided by IAH and 35.89 percent of the total assets of Islamic banks in Bahrain at the end of June 2015 (CBB 2015). Guarantees came in the third place. Collateral arrangements and guarantees are arrangements undertaken before extending credit, while loan loss reserve is determined after extending credit as a cushion against the possibility of future debtor default. On balance sheet netting is a common practice that is adopted by 69.1 per cent of the banks. None of the respondents mentioned that their banks are using parallel *Salam* contracts; this is probably because banks in Bahrain are not engaged in *Salam* arrangements, as indicated in the consolidated balance sheets of the Islamic banks published by the CBB. Nearly three quarters of the respondents indicated that their banks use *hamish jediah* to mitigate against the possible losses in cases in which the order fails to honor his/her commitment. These results are somewhat similar to those reported by Ariffin et al. (2009) who found that collateral arrangements were the most widely

used risk mitigation technique, followed by guarantees and loan loss. However, on balance sheet netting is used by only 22 per cent of the sample.

Bankers were asked to express their opinion of additional issues related to their risk exposure. Table 5 summarizes the responses to the five additional issues relevant to risk management of Islamic banks. Even though Islamic banks have existed for more than three decades, the Islamic bankers still hold the view that there is a lack of understanding of the risks involved in Islamic models of financing, as the mean response is 4.13. This is least applicable to *Murabahah*, which is the most widely used mode of financing, and is more applicable to *Sukuk* (Islamic bonds). These opinions are probably due to the lack of standardized Islamic products and contracts. The bankers surveyed believe that a lack of standardization of a number of Islamic financing modes, such as *Sukuk*, contributed to the risk management challenges facing Islamic banks. Although depositors in Islamic banks expect a rate of return based on profit sharing, Islamic banks are under pressure to emulate the rate of return paid by other Islamic banks and conventional banks. This imposes additional risk related to the liabilities on the balance sheet. Respondents ranked this concern at 4.00. Failure to match the rate of return on deposits paid by competitors will result in depositors shifting their investment to other banks, which results in a withdrawal risk. Islamic bankers rate this risk at 4.11. The bankers also regard seriously the fiduciary risk in which the depositors blame the bank for a lower rate of return, with a score of 3.84. These results confirm those reported by Khan and Ahmed (2001), although the ratings of the issues in Table 5 are higher than those of Ariffin et al. (2009). This is partly due to the accumulation of experience by Islamic banks and improvement in regulation resulting from compliance with Basel II requirements.

Table 5. Mean responses of the respondents regarding risk issues faced by Islamic banks

Issues	Mean	SD
Lack of understanding of risks involved in Islamic models of financing	4.13	0.66
The rate of return on deposits has to be similar to that offered by others banks	4.00	0.65
Withdrawal risk: A low rate of return on deposits will lead to withdrawal of funds	4.11	0.58
Fiduciary risk: Depositors will hold the bank responsible for a lower rate of return on deposits	3.84	0.73
Lack of standardized Islamic products and contracts	4.14	0.62

Note: *Standard deviation

5. SUMMARY AND CONCLUSIONS

The unique structure of Islamic financing modes offered by Islamic banks and their sources of funding have important implications for the type of risks facing Islamic banks. The results of the survey indicate that the credit risk is the most serious risk facing Islamic banks, followed by liquidity risk, and market risk. The type of assets held by Islamic banks might explain such findings. Operational risk is ranked fifth in terms of importance. With regard to the level of risk of the financing modes, *mudarabah* is perceived as the riskiest, followed by *musharakah*,

while the most widely used mode, murabahah, is ranked by the respondents as the least risky financing mode. Furthermore, the seriousness of the type of risk associated with financial instruments differs. Such findings indicate that, to manage risk effectively, Islamic banks should evaluate the riskiness of each instrument separately.

Islamic banks are found to adopt traditional risk measurement techniques rather than sophisticated techniques such as value at risk, simulation, and earnings at risk. The relative novelty of Islamic banking instruments and the use of systems developed for conventional banks are probably the reasons why Islamic banks rely more on traditional risk measurement techniques. As for the risk mitigation techniques, Islamic banks are found to use the methods adopted by conventional banks more extensively than those that are more relevant to Islamic instruments.

The findings of the study suggest that the players in the Islamic banking industry, i.e. banks, regulators, supervisory authorities and AAOIFI, should consolidate their efforts to develop guidelines for the identification, assessment, and management of the risks facing Islamic banks, taking into consideration the structure of the balance sheets of those banks. The efforts of the IIFM are a step in the right direction.

The results reported should be read with caution because of the limitations of the study. Those limitations include that respondents might have expressed their beliefs about what banks should be doing rather than reporting actual practices in their banks and that the results might have been affected by the environment following the global economic and financial crisis.

The differences between the results reported in this study and those of Khan and Ahmed (2001) and Ariffin et al., (2009) suggest that there is a need to extend such studies to other jurisdictions. The result of such an extension would provide the necessary background to develop more robust risk measurement and management techniques that the Islamic banking industry requires. A natural extension would be to study the risk management aspects from the perspective of the providers of funds, i.e. investment account holders and shareholders.

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