



## **A THEORETICAL ANALYSIS OF THE OPERATIONAL RISK FRAMEWORK IN ISLAMIC BANKS**

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### **ABSTRACT**

In terms of operational risks, Islamic banks have certain similarities with the conventional banking system since they function within a similar financial environment. However, the challenges are more complex for Islamic banks owing to their particular contractual and financial transactions. For this reason, it is understood that operational risks in Islamic banks are perceived to be significantly higher. This is one of the main building blocks from which the paper is developed. The theoretical analysis offered by this paper starts with presenting the arguments as to why Islamic banks have a distinct operational risk aspect, as compared to conventional banks. It also examines operational risk exposures in Islamic banks by mapping such risks. In addition, the paper also sheds light upon operational risk issues from a regulatory point of view, namely Basel and the Islamic Financial Services Board (IFSB). Lastly, the analysis in this paper suggests the need for maintaining capital specifically to mitigate losses caused by operational risk in Islamic banks. This paper, hence, provides a step further in understanding operational risk issues by providing the four dimensions of operational risk in Islamic banks, namely *Shari'ah* compliance risk, fiduciary risk, people risk, and legal risk.

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## 1. INTRODUCTION

Operational risk management in financial institutions has undoubtedly attracted more attention from regulators, practitioners, and also academics over the last decade. One of the reasons is because of the huge losses incurred by a number of financial institutions such as Barings, Daiwa and Merrill Lynch, due to the malfunctioning of their operational risk management (Hoffman, 2002; Hull, 2007; Hussain, 2000). Having learnt the lessons from the current financial failures, regulators and practitioners have, therefore, seriously taken the issue. In spite of the wide range of areas and issues in operational risk that need to be catered, attempts to define and classify operational risk have been made by several institutions, most notably by the Basel Committee on Banking Supervision (BCBS), which proposed a definition of operational risk through its consultative document on operational risk (BCBS, 2001).

The industry has a wide range of responses to the definition proposed by the BCBS. Despite the criticisms received from the industry, a positive side of the proposal is that banks start to realize the importance of managing operational risk, and therefore start to put aside a certain percentage of capital for operational risk, in addition to credit and market risk.

In the Islamic banking industry, the need to cater to the operational risk issue has also been highlighted by Akkizidis and Kumar (2008), Archer and Haron (2007), Hossain (2005), Iqbal and Mirakhor (2007), Khan and Ahmed (2001), and Sundararajan and Errico (2002). This is not surprising, since Islamic banks operate in similar, if not the same, business environment. Khan and Ahmed (2001) show that operational risk is relatively higher and serious than credit risk and market risk for Islamic banks. Unfortunately, there has not been any single literature which thoroughly tackles the issue. This may be due to the fact that operational risk carries complexities, and it is a relatively new area which needs more academic inquiry. This is the reason from which this paper is developed.

The paper starts with a discussion on the nature and origin of Islamic banks and analyze why an Islamic bank has a distinct operational aspect, as compared to the conventional one. It goes on with an examination of operational risk exposures in Islamic banks. The following section discusses how to identify and conduct a mapping of operational risk in Islamic banks, which are also different from conventional ones on the

structure of their financial contracts. Thus, they bring different features of operational risk in different contracts. This is the issue which is discussed in the subsequent sections. The analysis would not have been complete without tackling the issue of having adequate capital in order to cover operational losses. The last section presents the concluding remarks.

## 2. NATURE AND ORIGIN OF ISLAMIC BANKS

The way the financial system is set up can be very central for efficient resource allocation. History has shown that the financial system is determined by the nature of financial intermediation. Rapid development in the financial system has made financial intermediary more important in the economy. The acquisition and processing of information about economic agents, the packaging and repackaging of financial claims, and financial contracting are among the activities that differentiate financial intermediation from other economic activities (Mishkin, 2004). The nature of intermediation has changed drastically over the last three decades due to the changes in macroeconomic policies, liberalization of capital accounts, deregulation, and advances in financial theory as well as breakthroughs in technology. Lending-based operations which characterize traditional banking activity have been replaced by more fee-based services that bring investors and borrowers directly in contact with each other. Financial intermediation in the form of traditional banking—mainly based on the operations of lending—has declined considerably in developed countries, where market-based intermediation has become dominant.

In Islamic history, financial intermediation has an established historical record and has made significant contributions to economic development over time. The simplest manifestation of financial services within the early Muslim states took the form of money-changers (*ṣayārīfah*; sing., *ṣarrāf*) who were also partially engaged in the holding of deposits and the short-term financing of trade (Chapra and Khan, 2000). Yet a more sophisticated form of banking finance for trade and government was represented by the *jahābidhah* (sing., *jahbadh*) who practiced much of the modern financing activities under the supervision of the Muslim state (Chachi, 2005; Heck, 2006). In the highly developed market economy of the Abbasid State, *jahābidhah* bankers proliferated throughout the state, even though they were mostly of Jews who enjoyed

the status of *Ahl al-Kitāb* origin (People of the Book). The *jahābidhah* were basically trade vendors who concurrently practiced the business of financing commercial transactions of others. Banking operations were therefore ancillary to primary mercantile operations, yet they seemed to have grown sizeable particularly when the *jahābidhah* accepted deposits in effort to augment their own businesses. The high streets of Basra were so much supplied with money-changers and *jahābidhah* that the banking network in Basra was rightly called by a Western historian 'the Wall-Street of the Middle Ages' (Heck, 2006). The famous Persian historian, Naṣir-i Khusraw, was reported to have estimated the number of *jahābidhah* bankers in the state of Iṣfahan alone at 200 (Heck, 2006). It was such a complex network of banking activities that the call for appropriate government supervision and regulation was acknowledged by the Islamic state. To this effect, the Abbasid State established a central banking agency in year 316 H/ 929 A.D. called *Dīwān al-Jahābidhah* to oversee the performance and growth of banks within the empire. A similar central bank was established in Egypt by the Faṭimid State by the name *Dār al-Māl* in the commercial capital of Fustat to supervise an equally intense *jahābidhah* banking activity in Faṭimid Egypt. Among the most commonly practiced banking instruments were the *ṣakk* (the Arabic root of 'cheque') and the *suftajah* (which combined features of traveler's cheques and letters of credit), the *ḥawālah* (which is a means of credit transfer), *wadī'ah* (i.e., deposit), *ruq'ah* (which was a sort of promissory note). The use of cheque (*ṣakk*) was particularly known since the time of the Rightly-Guided Caliphs. A renowned historian, Ibn 'Abdel-Hakam, reported that 'Umar ibn al-Khaṭṭāb paid for the grains delivered to the state warehouses by cheque, and that he used to pay government wages by cheques signed by his treasurer Zayd ibn Thābit (Heck, 2006).

The existence of Islamic banks in the present day is believed to be a modern transformation of the *jahbādih* (Chachi, 2005; Chapra and Khan, 2000; Heck, 2006). As a matter of fact, such transformation started to materialize in Mit Ghamr, Egypt from 1963 to 1967 when there was an initiative by the Mit Ghamr Savings Bank to mobilize small savings from the rural sector largely through savings account without any interest payment to the account holders. It was followed by the establishment of the Nasser Social Bank in 1971, the Dubai Islamic Bank, and the Islamic Development Bank as the first

international Islamic financial institution in 1975. Moreover, the Islamic banking industry witnessed a very rapid growth surpassing US\$ 100 billion worth during 1980-1990 (Iqbal and Molyneux, 2005, 64).

Having been regarded as an alternative financial intermediary with profit and loss sharing contract (in *muḍārabah* and *mushārah* contract) as its cornerstone, an Islamic bank is, theoretically, expected to bring more stability and efficiency in resource allocation. In addition to that, an Islamic bank is also equipped with contracts which may, slightly, look similar to what a conventional bank has been commonly practicing; i.e., debt financing (in *murābahah* contract). Nevertheless, the nature of debt in an Islamic bank is qualitatively different from that of a conventional bank since debt contract in an Islamic bank is required to be tied to some underlying assets (Ahmed, 2005 and Khan, 1995). Consequently, the distinctive contractual structure that an Islamic bank embodies necessitates a different treatment on the management of the operational system of an Islamic bank.

### 3. OPERATIONAL RISK EXPOSURES OF ISLAMIC BANKS

As a modern form of *jahbādih*, an Islamic bank is an institution offering financial services which conforms to the *Shari'ah*. A set of *Shari'ah* principles governing the operations of Islamic banks are: (a) prohibition of dealing with interest (*ribā*); (b) financial contracts must be cleared from contractual uncertainty (*gharar*); (c) exclusion of gambling (*maysir*) in any financial activity; (d) profit must not be originated from *ḥarām* economic and financial activities (prohibited industries such as those related to pork products, pornography, or alcoholic beverages); (e) each financial transaction must refer to a tangible, identifiable underlying asset; and (f) parties to a financial transaction must share in the risks and rewards attached to it. The principles mentioned above must be, conceptually, inherent in Islamic banks, in order to distinguish them from conventional banks.

With regard to operational risk, Islamic banks face the same challenges as conventional ones, to the extent that it exists in the ordinary course of various banking activities (Archer and Haron, 2007; and Hossain, 2005). At this phase, the challenge is fairly similar for all financial intermediaries, whether *Shari'ah*-compliant or not. Nevertheless, the challenges are more complex for Islamic banks owing to their activities and unique features of financial contracts. The Islamic

Financial Services Board (IFSB) clearly mentions in its publication that Islamic banks are exposed to “a range of operational risks that could materially affect their operations” (IFSB, 2007a, 22). Further, it is argued that operational risk is likely to be more significant for Islamic banks due to their specific contractual features (Fiennes, 2007; Greuning and Iqbal, 2008; Iqbal and Mirakhor, 2007; Khan and Ahmed, 2001; Kumar, 2008; Sundararajan and Errico, 2002; Sundararajan, 2005).

Unlike the Basel II’s definition of operational risk, which states “operational risk is the risk of loss resulting from inadequate or failed internal processes, people or system, or from external events” (BCBS, 2001, 2), in Islamic banks operational risk is associated with the loss resulting from “inadequate or failed internal processes, people and system, or from external events, including losses resulting from *Shari’ah* non-compliance and the failure in fiduciary responsibilities” (IFSB, 2005a, 26). It is understood that the definition of operational risk in Islamic banks includes legal risk (Archer and Haron, 2007; Cihak and Hesse, 2008; Djojosingito, 2008, Fiennes, 2007; Khan and Ahmed, 2001; Sundararajan, 2005), and also reputation risk (Fiennes, 2007; Akkizidis and Kumar, 2008; Standard & Poor’s, 2008). The foremost distinctive feature of this definition, as compared to the definition by Basel II, is the inclusion of *Shari’ah* non-compliance risk and fiduciary risk. As a matter of fact, *Shari’ah* non-compliance risk is considered to be of a significant portion of operational risk (IFSB, 2007b, 6).

*Shari’ah* non-compliance risk is the risk arising from an Islamic bank’s failure to comply with the *Shari’ah* rules and principles determined by the *Shari’ah* Board or the relevant body in the jurisdiction in which the Islamic bank operates (IFSB, 2005a). The failure to comply with such principles will result in the transaction being cancelled, and hence the income or loss cannot be recognized. Moreover, fiduciary risk is the risk that arises from the Islamic bank’s failure to perform in accordance with explicit and implicit standards applicable to their fiduciary responsibilities (IFSB, 2005a).

Another distinctive aspect from the definition is the recognition of reputation risk. Maintaining good reputation is crucial for Islamic banks (Hamidi, 2006) since failure to do so could trigger an exodus of funds which would result in a liquidity crisis. Reputational damage could also make retail customers stop requesting financing from Islamic banks, triggering a downturn in profitability. Therefore, in order to keep a good reputation, it is suggested that Islamic banks need to do two things;

firstly, to ensure that their financial products are *Shari'ah* compliant (Greuning and Iqbal, 2008; Iqbal and Mirakhor, 2007), secondly, to effectively maintain their fiduciary roles (Muljawan, 2005).

The spotlight above explains why operational risk management in Islamic banks is not similar to that in conventional banks. There are a number of dimensions that need to be added in the analysis. Although it is argued earlier that the challenges are somewhat similar, it is only to the extent that Islamic banks and conventional banks are dealing with various banking activities. To a greater extent, operational risk management in Islamic banking requires more thorough understanding of the sources of operational risk from which losses could occur. Operational risk in Islamic banks could, therefore, appear based on the following major sources: (a) *Shari'ah* non-compliance risk; (b) fiduciary risk; (c) people risk; and (d) legal risk.

### 3.1 SHARI'AH NON-COMPLIANCE RISK

The IFSB's guiding principles on risk management for institutions offering Islamic financial services, other than insurance institutions, clearly mentions the definition of *Shari'ah* non-compliance risk. It is the risk which arises from "IIFSs' failure to comply with the *Shari'ah* rules and principles determined by the *Shari'ah* board of the IIFS or the relevant body in the jurisdiction in which the IIFS operate" (IFSB, 2005a, 26). For Islamic banks, to be *Shari'ah* compliant is paramount. According to the IFSB Principle 7.1, Islamic banks shall have in place adequate systems and controls, including *Shari'ah* Board/Advisor, to ensure compliance with *Shari'ah* rules and principles (IFSB, 2005a, 27). Such compliance requirements must be pervasively infused throughout the organization as well as in their products and activities. *Shari'ah* compliance is considered by the IFSB as a higher priority category in relation to the other identified risks, since violation of *Shari'ah* principles will result in the transactions being cancelled or income generated from them considered as illegitimate.

The need to ensure compliance with *Shari'ah* in operational risk management is vital (Aziz, 2006) and it must encompass the products, activities, and contract documentation—with regard to formation, termination and elements which might possibly affect contract performance such as fraud and misrepresentation. Furthermore, the degree of *Shari'ah* compliance, as the IFSB (2005a) suggests has to

be reviewed, at least, annually which can be performed by a credible party, either from a separate *Shari'ah* control department or as part of the existing internal and external audit. The main objective is to ensure that (a) the nature of Islamic banks' financing and equity investment; and (b) their operations are executed in adherence to the *Shari'ah* principles.

In the event that *Shari'ah* non-compliance occurs, either in the products or activities, Islamic banks need to keep record of the profits out of it. The record will help Islamic banks assess the probability of similar cases arising in the future. Further, historical reviews and data of potential areas of *Shari'ah* non-compliance will enable Islamic banks to make an assessment on the potential profits which cannot be recognized as legitimate profits. In order words, potential losses could be managed, hence reduced to a minimum level.

With respect to *Shari'ah* requirements in financing contracts, albeit the diversity of interpretations prevalent in the industry, the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) has already issued its latest *Shari'ah* standard that could be referred to by Islamic banks. In sum, *Shari'ah* compliant financing—in six different contracts—needs to fulfill the following *Shari'ah* requirements (AAOIFI, 2005):

(a) *Murābahah* and *ijārah* contracts:

- The asset is in existence at the time of sale or lease or, in *ijārah*, the lease contract should be preceded by acquisition of the usufruct of the leased asset;
- The asset is legally owned by Islamic banks when it is sold;
- The asset is intended to be used by the buyer/lessee for activities or business permissible by *Shari'ah*; if the asset is leased back to its owner in the first lease period, it should not lead to contract of *'inah*, by varying the rent or the duration;
- In the event of late payment, there is no penalty fee or increase in price in exchange for extending or rescheduling the date of payment of accounts receivable or lease receivable, irrespective of whether the debtor is solvent or insolvent.

(b) *Salām* and *istisnā'* contracts:

- A sale and purchase contract cannot be inter-dependent and inter-conditional on each other. This is for the case of *salām* and parallel *salām* or *istisnā'* and parallel *istisnā'*;

- It is not allowed to stipulate a penalty clause in respect of delay in delivery of a commodity that is purchased under *salam* contract. However, it is allowed under *istisnā'* or parallel *istisnā'*;
- The subject matter of an *istisnā'* contract may not physically exist upon entering into the contract.

(c) *Mushārah* and *muḍārah* contracts:

- The capital of the Islamic banks is to be invested in *Sharī'ah* compliant investments or business activities;
- A partner in *mushārah* cannot guarantee the capital of another partner or a *muḍārib* guarantees the capital of the *muḍārah*;
- The purchase price of another partner's share in a *mushārah* with a binding promise to purchase can only be set as per the market value or as per the agreement at the date of buying. It is not permissible to stipulate that the share be acquired at its face value.

Clearly, it is vital for Islamic banks to abide by the *Sharī'ah* principles in every aspect of their financial transactions. In addition to that, the process of structuring the contracts is also very important. In other words, the sequence in structuring certain financial products could determine the degree of *Sharī'ah* compliance, since a few contracts could be used as legal devices to circumvent certain *Sharī'ah* principles.

### 3.2 FIDUCIARY RISK

Islamic banks are liable for losses arising from their negligence, misconduct or breach of their investment mandate; the risk of losses which arises from such events is characterized as a fiduciary risk. In other words, fiduciary risk is an indication of failure to “perform in accordance with explicit and implicit standards applicable to their fiduciary responsibilities” (IFSB, 2005a, 26). The indication of such failure can be seen from the high degree of their earnings volatility. As a result of losses, Islamic banks may become insolvent and as a consequence unable to (a) meet the demands of current account holders for repayment of their funds, or (b) protect the interests of its investment account holders.

In performing their fiduciary role, Islamic banks are compelled to preserve the interests of all fund providers, as prescribed by the IFSB standard on risk management principle 7.2 (IFSB, 2005a, 2). In doing so, Islamic banks must ensure that the bases for “asset, revenue, expense

and profit allocations are established, applied and reported in a manner consistent with Islamic banks' fiduciary responsibilities" (IFSB, 2005a, 27).

Islamic banks' fiduciary duty is all about preserving the trust from all fund providers. Two important aspects that seriously need to be taken into consideration in safeguarding the trust are:

- (a) *Shari'ah* aspect: Islamic banks must ensure that the activities and the products are *Shari'ah*-compliant;
- (b) *Performance* aspect: Islamic banks are required to have sound financial performance, without which fund providers might suspect that there is mismanagement or misconduct.

In the *Shari'ah* aspect, Islamic banks may follow the guidance set by their own or independent *Shari'ah* supervisory board, while in the performance aspect Islamic banks may create policy which includes the following:

- Identification of investing activities that contribute to investment returns and taking reasonable steps to carry on those activities in accordance with the Islamic banks' fiduciary and agency duties and to treat all their fund providers appropriately in conformity with the terms and conditions of their investment agreements;
- Allocation of assets and profits between the IIFS and their investment account holders (IAH) will be managed and applied appropriately to IAH having funds invested over different investment periods;
- Determination of appropriate reserves at levels that do not discriminate against the right for better returns of existing IAH;
- Limitation of the risk transmission between current and investment accounts;
- Timely provision of information disclosure to IAH and the market as a reliable basis for assessing their risk profiles and investment performance.

The element of trust is very important in the relationship between Islamic banks and fund providers. This relationship, as Iqbal and Mirakhor (2007) argue, distinguishes Islamic banks from conventional ones and is the sole justification for the existence of the Islamic banks. Thus, Islamic banks are always expected to act in the best interest of their fund providers, i.e., investors/depositors and shareholders. With respect to their fiduciary role, Islamic banks are exposed to fiduciary risk if they are unable to align the objectives of investors and shareholders with the actions that they are supposed to carry out.

The consequences of fiduciary risk can be enormous, particularly if Islamic banks start to lose their reputation from their customers. Iqbal and Mirakhor (2007) show that fiduciary risk can have a detrimental impact; i.e., if the banks are declared to be insolvent, which is the worst case, the banks are unlikely to be able to meet the demands of the current and investment account holders. Hence, a sound level of solvency helps Islamic banks enhance their credibility in the sights of fund providers. With respect to this, Muljawan (2005) suggests three numerical indicators which can possibly be used to indicate the level of a bank's solvency; first, capital adequacy ratio (CAR) based on the IFSB directives; second, equity coverage ratio that reflects the capability of the bank's own capital to effectively cover the potential loss emanated from the bank's financial exposures; and third, leverage ratio that estimates the residual claims of the bank.

Examples of fiduciary risk exposures are as follows (Greuning and Iqbal, 2008; Iqbal and Mirakhor, 2007):

- In the case of a partnership-based investment in the form of *muḍārabah* and *mushārahah* on the assets side, the bank is expected to perform adequate screening and monitoring of projects. Any deliberate or even non-deliberate negligence in evaluating and monitoring the projects can lead to fiduciary risk. It becomes incumbent upon the bank's management to perform due diligence before committing investors/depositors' funds.
- Mismanagement of funds of current account holders, which are accepted on trust (*amānah*) basis, can expose the bank to fiduciary risk as well. It is a common practice of Islamic banks to utilize current account holders' funds without any obligation to share the profit with them. However, in case of heavy losses on investments financed by current account holders' funds, depositors can lose confidence in the bank and this can lead to their taking legal recourse.
- Mismanagement in governing the business, incurring unnecessary expenses or allocation of excessive expenses to investment account holders is a breach of the implicit contract to act in a transparent fashion.

A good reputation is, without doubt, affected by how optimal Islamic banks maintain their fiduciary roles. While other literatures (Greuning and Iqbal, 2008; Iqbal and Mirakhor, 2007) show that reputation risk is part of operational risk, this paper argues that reputation risk is, in fact, a resulting impact of failure in maintaining fiduciary roles.

### 3.3 PEOPLE RISK

People risk is another type of operational risk arising from incompetence or fraud, which exposes Islamic banks to potential losses. This includes human errors, lack of expertise, non-compliance and fraud (Akkizidis and Kumar, 2008). The risk of a loss intentionally or unintentionally caused by an employee such as employee error and employee misdeeds, or involving employees such as in the area of employment disputes, is the risk class that covers internal organizations problems, fraud and losses. Unfortunately, as Akkizidis and Kumar (2008) contend, the largest amount of losses comes from intentional activities such as fraud and unauthorized trading.

Although there has not been any single research assessing the exposure of people risk in Islamic banks, it is understood that the challenge is considerably high. The thriving development of the Islamic banking industry, unfortunately, has not been matched with the number of people who have the credentials in running and directing the business. This issue has been highlighted by Aziz (2006), Edwardes (2002), Jackson-Moore (2007), Khan (2004), Khan and Ahmed (2001), Kumar (2008), and Nienhaus (2007). The dimension of people risk in Islamic banks is understandably wider than in conventional ones since Islamic banks' personnel are required to be well-versed in both conventional banking products and their status in relation to Islamic requirements (Aziz, 2006; Ebrahim, 2007; Nienhaus, 2007). There is a need that the Islamic banking industry must be equipped with a new breed of innovators, risk managers, regulators and supervisors who have the right blend of knowledge of finance and understanding of the *Shari'ah* (Aziz, 2006).

Furthermore, they should be aware of the existing Islamic alternatives and their commercial advantages and disadvantages compared to the conventional products (Nienhaus, 2007). A shortage in skilled bankers who are, at the same time, well-versed in *Shari'ah* or *Shari'ah* scholars who are familiar with conventional banking products, as Jackson-Moore (2007) contend, will lead to higher people risk. In other words, inadequately trained staff or incapable personnel will expose Islamic banks unnecessarily to operational risk. In response to a very demanding industry, staffs of Islamic banks must be able to design *Shari'ah*-compliant financial innovations in order to meet the diversified needs of clients and to match the ever increasing scope of

conventional techniques, procedures, and products. More importantly, despite the fact of such challenges, staffs of Islamic banks should be able to create financial contracts which are more than just legally interest free. In other words, skilled staffs of Islamic banks will ensure that the products are efficient as well as *Shari'ah*-compliant. Unskilled staffs can cause the product to be either illegitimate according to *Shari'ah* or inefficient.

A financial institution called an Islamic bank is not free from fraud, whether intentional or unintentional. According to Akkizidis and Kumar (2008), fraud is an intentional activity which may cause a large amount of losses. It can also invade every area of businesses when a motive coincides with an opportunity. Moreover, Akkizidis and Kumar (2008) suggest that financial institutions should establish appropriate systems and thorough control for the management of operational risks that may arise from their own employees. Hence, the following direction can be established (Akkizidis and Kumar, 2008, 194-95):

- Selection of employees that respect and follow *Shari'ah* principles
- Separation of the employees' duties
- Internal supervision of employees' performance
- Monitoring of the employees' behavior
- Well-established policies that comply with *Shari'ah* principles and are well-known by all employees
- Training process to direct employees in the process of the risk management
- Well-defined employment termination policies and procedures.

At the current stage, it is understood that people risk can contribute to operational risks considerably. One of the reasons is because of the lack of people who are well-versed in both modern financial transactions and applied *fiqh mu'āmalāt*. In most cases, Islamic banks hire *Shari'ah* scholars who hardly understand the complexity of modern financial transactions. On the other hand, it is also very difficult to find financial economists who are well-literate in applied *fiqh mu'āmalāt*.

### 3.4 LEGAL RISK

The inclusion of legal risk as part of the broader notion of operational risk, however, has been a subject of debate among academicians and practitioners (Hadjiemmanuil, 2003; and Scott, 2001). One of the reasons might be due to the difficulties in defining its nature (Scott, 2001).

Furthermore, as Scott (2001) argues, legal risk has an unpredictable effect, although it determines the amount of losses that banks have to incur. Integrating legal risk as a subset of operational risk is also criticized for being neither self-evident nor universally accepted (Hadjjemmanuil, 2003). For instance, in May 2000 the IFCI Financial Risk Institute, a non-profit foundation established by derivatives exchanges, market participants and regulators issued descriptions of principal sources of risks which concern regulators in derivatives and commodities markets. The documents specifically include market, credit, settlement and ‘other’ risks. On this account, the residual ‘other’ category covers, in particular, liquidity, legal and operational risks. With regard to legal risk, the document defines it as “the risk that a transaction proves unenforceable in law”. Typical examples of legal risk are also given. These include legal uncertainties surrounding the legal capacity of banks’ contractual counterparties to enter into binding transactions, the legality of derivatives transactions and/or the recognition and effectiveness of netting arrangements in bankruptcy (IFCI Financial Risk Institute, 2000; as cited in Hadjemmanuil, 2003).

As a matter of fact, its meaning varies, depending on the specific context and the practical concern of the persons employing it (Hadjjemmanuil, 2003). In relation to litigation or liability insurance, the term may refer mainly to civil liabilities, including duties to compensate the victims of torts and to make contractual payments or provide indemnities in certain contingencies. In the derivatives market, much emphasis is placed on uncertainties regarding the legal recognition of novel contractual arrangements, which have not been tested in the courts. In international lending or project financing, a major concern is the relative risk of doing business in different countries; to a significant extent, this depends on differences between their legal and judicial systems—in particular, their effectiveness in enforcing creditors’ rights.

Furthermore, Hadjemmanuil (2003) suggests that there are different ways in which losses may arise, all of which are often classified under the domain of legal risk. Thus, the losses may be attributable to: (a) Legally flawed actions of the bank or its employees and agents, as a result of which the bank either incurs direct liabilities or becomes unable to ascertain in law certain rights in order to protect its interests; (b) Legal uncertainty; which does not depend on any fault of the bank itself, since this is an external parameter, it affects even the most diligently and prudently run institutions. Sometimes, the law is intentionally

expressed in general and abstract terms. Because of informational constraints, it is impossible to draft complete rules which make special provision for each and every eventuality;

(c) Legal uncertainties and financial innovation. Innovation, however, is a significant contributor to legal risk as well. The adoption of new and complex transactional techniques, in particular, is often surrounded by significant legal uncertainty and can expose banks to potentially catastrophic risk;

(d) Country specific legal perils and costs. The term legal risk can also refer to the relative risk of doing business in different countries, as a function of the quality of their legal system. Jurisdictions can be compared by reference to the effects of their laws and judicial systems in terms of increasing or attenuating the risk. From this perspective, legal risk is primarily an attribute of the legal system, not of the banking institutions or of their activities. This approach may be useful in relation to international lending or project-financing activities, where the evaluation of a country's relative legal risk can have significant pricing and risk management implications.

Despite his critics, Hadjiemmanuil (2003) shows the reasons why legal risk is associated with operational risk; it is because fraud taking place in financial institutions is considered to be both (a) the most significant category of operational loss event, and (b) a legal issue.

In Islamic banking context, although the term 'legal risk' is not clearly mentioned in the IFSB standard when specifying the aspect of operational risk, nevertheless from what is shed light upon by Cihak and Hesse (2008), Djojosingito (2008), Hassan and Dicle (2005), Iqbal (2005), Kahf (2005), Kumar (2008), Nienhaus (2005), and Sundararajan (2005), the impacts of legal risk on Islamic banks, with regard to the spectrum of operational risk management, are substantial and cannot be neglected. In Islamic banks, legal risk may arise from uncertainty in laws (Kumar, 2008), lack of reliable legal system to enforce financial contracts (Djojosingito, 2008; Iqbal, 2005; Sundararajan and Errico, 2002; Sundararajan, 2005), legal uncertainty in the interpretations of contracts (Cihak and Hesse, 2008), the legality of financial instruments (Djojosingito, 2008), lack of availability of legal experts (Kumar 2008), and exposure to unanticipated changes in laws and regulations (Djojosingito, 2008). In addition to that, it is argued that some operational aspects of Islamic banking activities are not sufficiently covered by laws, which, in turn results in the exposure of legal risk to Islamic

banks (Djojosugito, 2008). It comes from the fact that most Islamic banks, at the current stage, operate within similar legal and business environments (Hassan and Dicle, 2005; and Kahf, 2005).

Although the profile of legal risk in Islamic banks seems similar to the conventional ones, the reality can be substantially different if the *Shari'ah* aspect is taken into account in the operation of laws. For instance, there is a requirement that the court refers the question of *Shari'ah* to *Shari'ah* people. However, the legal risk is still present since the final decision will still be made by the court. The additional problem is related to the jurisdiction of the *Shari'ah* board. In Indonesia for instance, as stated by Djojosugito (2008), the *fatwas* of the National *Shari'ah* Board (DSN)<sup>2</sup> are only binding upon the *Shari'ah* supervisory board of the Islamic banks, but not to the financing recipient of the Islamic banks. Consequently, if the financing is invested in activities which violate *Shari'ah* principles, it will certainly affect the income of Islamic banks being considered as illegitimate.

Uncertainty in regulation may also account for legal risk if such regulatory changes affect the legality of certain Islamic financial instruments. This is the case in Indonesia where the law views some *muḍārabah* bonds issued as debt which in effect is guaranteed by the patrimony of *muḍārib* (Djojosugito, 2008). While the *Shari'ah* prohibits such recourse, the law will not uphold the *Shari'ah* prohibition. In essence, legal risk is expected to prevail in the Islamic banking industry since in most Muslim countries *Shari'ah* principles are still only partially implemented.

#### 4. IDENTIFICATION OF OPERATIONAL RISK

A main part in designing an effective operational risk management system is the identification of both internal and external operational risks (Akkizidis and Kumar, 2008). Internal operational risk attributes loss exposure to the potential for failure of people, processes and technology in the course of regular business operations, such as breaches in internal controls and monitoring, internal and external fraud, legal claims or business disruptions and improper business practices (Zamorski, 2003). These risks are more specifically defined as:

(a) Process risk, associated with operational failures stemming from the breakdown in established processes, failure to follow processes or inadequate process mapping within business lines;

- (b) People risk, from management failure, organizational structure or other human failures, which may be exacerbated by poor training, inadequate controls, poor staffing resources, or other factors; and
  - (c) System risk, which reflects the operational exposure to disruptions and outright system failure in both internal and outsourced operations.
- External operational risk (or external dependency risk) arises from environmental factors, such as new competitor that changes the business paradigm, a major political and regulatory regime change, unforeseen (natural) disasters, terrorism, vandalism, and other such factors that are outside the control of the firm (Mark, 2002, as cited in Jobst, 2007).

In Islamic banks, such identification should also refer to operational risk for insufficient compliance with *Shari'ah* rules and principles as clearly exemplified in section 3.1. Financial institutions should identify and assess the operational risk inherent in all products, activities, processes, and systems. Moreover, Basel II and the IFSB directives, further state that risk identification is essential for the consequent development of a practical operational risk monitoring and control system. However, the key factors that negatively affect the financial institutions in terms of reaching their business objectives should be identified first. Effective risk identification considers both internal and external factors that could negatively affect the process of reaching the financial institution's objectives. Some internal factors are (a) the structures of the institution's accounts; (b) the corresponding contracts; (c) the nature of the institution's activities; (d) the quality of the institution's human resources; and (e) organizational changes and employee turnover. Moreover, some external factors are (a) the changes in the industry; and (b) the technological advances.

It should be standard practice for a financial institution's management to implement policies and procedures to manage risks arising from their operational activities. The institution should maintain written policies and procedures that identify the risk tolerances approved by the board of directors and should clearly define the lines of authority and responsibility for managing the risks. The institution's employees should be fully aware of all policies and procedures that relate to their specific duties.

The above factors should also be considered in the process for mapping the business operations and the risks that influence them. The mapping of operational processes is used to define key business operations, the various business units, the organizational functions, and

process flows as well as their direct or indirect links to business targets and objectives. Note that operations used in Islamic financial contracts must also be linked to *Shari'ah* compliance. For instance, the commodities, assets, or constructions agreed in *istisnā'* and *salam* contracts should always be linked to *Shari'ah* principles. Moreover, operations that refer to the process of producing and delivering products and services should be well defined and monitored with regard to the risk of not complying with *Shari'ah* principles. In addition, when the financial institution agrees on a partnership type of agreement, such as the *mushārahah* and *mudārabah*, additional mappings of the operational processes that are linked to these contracts should also be designed.

The operational process mapping exercise is used to identify key operations and design a roadmap of the combined key operations by defining inputs and outputs and linkage between them. In the risk-mapping process, all possible risks that might affect the operational processes are identified and linked to the operational process map. Operational risk mapping is used as the basis to identify the types of operational risk and their existence in Islamic financial contracts.

#### 4.1 IDENTIFICATION OF HAZARDS, EVENTS, AND LOSSES

Having performed operational risk mapping, an Islamic bank should be able to identify what are the causes of the risks, what are the events, and what are the downstream effects and consequences. However, it is sometimes difficult to identify the differences between causes, events, and consequences. In general, operational risk analysts and managers should have in their minds that:

- A 'cause' or 'hazard' should result in one or more events;
- An 'event' should have at least one cause and it must result in one or more consequences;
- A 'consequence' or 'loss' must result from one or more events and may result in a new cause.

Confusion usually arises in operational risk because of the distinction between risk (or hazard) type, event type, and consequence (or loss) type. When banks record their operational loss data, it is very essential to record it separately according to event type and loss type, and precisely identify the risk type as well. Mori and Harada (2001), Alvarez (2002), and Dowd (2003) suggest that the distinction between the three is comparable to cause and effect. Hazard constitutes one or more

factors that increase the probability of occurrence of an event; event is a single incident that leads directly to one or more effects (e.g. losses); and loss constitutes the amount of financial damage resulting from an event.

Mori and Harada (2001) show how operational losses would occur in a process called ‘cause-effect’ relationship between hazard, event, and loss. A loss is the effect of an event while an event is the cause of a loss. Yet, an event is the effect of a hazard while a hazard is the cause of an event. In other words, every loss must be associated with an event that caused the loss, while every event must be associated with one or multiple hazards that caused the event. Note that in the literatures of operational risk, hazard is also termed as risk (Marshall, 2001), or cause (Dowd, 2003), while loss and effects are often used interchangeably (Dowd, 2003).

Operational risk causes, events, and losses are usually associated with internal control weaknesses or lack of compliance with existing internal procedures as well as with *Shari'ah* principles. Examples of causes, events and losses are shown in Table 1. Such lack of compliance can be found in all areas of an institution and are mainly caused by the combined actions of people, technological systems, processes, and some unpredictable events. People are the area of greatest variability and, as a result, the source of the majority of operational risks. It is recommended that the organization look for root causes as opposed to effect. When a risk event is formulated, the causes or originating source of it must be identified as well as what consequences it will have and the resulting effect it will have on other risks. The resulting consequences if the risk is to be ‘accepted’, ‘avoided’, or ‘mitigated’ must also be understood. It is important that this categorization of a root cause analysis, that is, the causes of operational risk loss events, are captured in the loss event database. Identifying root causes can help identify additional, related risks. By linking causation to relevant business activities, through correlation analysis, this structure is intended to be used as a tool with which to act upon operational risks. This provides management with an effective operational risk management framework. The structure also lends itself to quantification of operational risks by drawing on data sources relevant for modeling.

Realistically, some operational risks must be accepted. However, how much is accepted, or not accepted, mainly depends on the operational risk impact and internal policies of the organization. Operational risks

TABLE 1  
Examples of Causes, Events, and Losses

Cause types	Event types	Consequence types
Deception of Individual's behavior	Internal Fraud	Regulatory and Compliance
Organizational and Corporate Behavior	External Fraud	
	Employment practices and workplace safety	Legal liability
Faults due to Information Technology	Business disruption, system failures	Loss/damage to assets
External Political and Financial Uncertainties	Damage to physical assets	Third party losses and damages to assets (in <i>ijārah</i> contract)
Inefficient Agreements with the counter-parties / partners due to inefficient operational evaluation of processes	Client, products, and business practices	Loss of reputation
	Execution, delivery, and process management	Restitution
		Loss of resources
Non financial external uncertainties	Default of keeping the promise to buy the commodity (in <i>murābahah</i> contract)	Loss of opportunities
Mismatching specification in commodities, assets		Loss of market share
Uncertainties in manufacturing and construction process	Defaults of the commodity's delivery ( <i>salam</i> and <i>istisnā'</i> contracts)	Exposure to market and credit risks
External partnership business risk	Failures on deliveries by the partnership obligations (in <i>mushārah</i> and <i>muḍārabah</i> contracts)	Losses from covering business failures ( <i>mushārah</i> and <i>muḍārabah</i> business agreement)
Unclear definitions in business activities for the partnership agreements that may be against the <i>Shari'ah</i> principles.	Default in following the principles of <i>Shari'ah</i>	Non-compliance with <i>Shari'ah</i> principles

Source: Akkizidis and Kumar (2008: 188)

with a high degree of impact should not be accepted, even if their probability is low. The decision to accept operational risk is affected by many inputs and policies. When a manager decides to accept operational risks, the decision should be coordinated whenever practical with the affected personnel and organizations, and then documented so that in the future everyone will know and understand the elements of the decision and why it was made.

#### 4.2 TYPES OF OPERATIONAL RISK CAUSES

Mapping operational risk during the identification process allows Islamic banks to define and measure the risks within the business and better understand their operational risk loss profile. Each financial institution has its own, individual and unique operational settings. Thus, to be able to manage operational risk may require tailoring its definition to the institution's specific settings. In operational risk identification analysis, all major business disruptions that result in operational risk losses initiated from people, system, and technology, policies, processes and delivery failures, transactions, and/or internal and external events should be taken into account (Akkizidis and Kumar, 2008, 189):

- (a) People; humans are one of the main sources of operational risk and play a major role in Islamic financial contracts;
- (b) Transactions; failures in financial transactions;
- (c) Systems and technology; this refers to systems and technology that are initiated by internal and external events;
- (d) Process and delivery failures; such disruptions may refer to process execution and delivery, and present in most Islamic financial contracts;
- (e) Internal and external events; these are events that cause losses to Islamic banks due to external events, political uncertainties, natural disasters, and the actual implementation of the Islamic contracts.
- (f) Policies, which refer to incomplete or missing legal documentations which affect compliance to *Shari'ah* principles. Furthermore, it includes unapproved access given to client accounts, or even to employment practices and workplace safety.

Profit and loss sharing is the cornerstone of Islamic financial institution and banks, in which the parties involved are committed to. However operational losses arise when applying all types of Islamic financial contracts, including *murābahah*, *ijārah*, *salam*, and *istisnā'*. Operational losses also appear in *mushārah* and *muḍārah*

contracts, where the institution has a close business relationship with the counterparties. In such agreements, the institution can be exposed to a great degree of operational risk since it has full responsibility for covering the entire amount of associated losses. For this reason, it is important to understand how different aspects of operational risk arise in various Islamic financial contracts, which will then be discussed in the following section.

## 5. OPERATIONAL RISK IN ISLAMIC FINANCIAL CONTRACTS

After identifying various aspects of operational risk in relation to Islamic banking, this section discusses the different dimensions of operational risk in different types of Islamic financial contracts. As can be seen in Table 2, four dimensions of operational risk are *Shari'ah* non-compliance risk (SR), fiduciary risk (FR), people risk (PR), and legal risk (LR). The first three dimensions are, by nature, internally inflicted; while the fourth one is naturally from external sources.

### 5.1 MURĀBAḤAH

*Murābaḥah* is “selling a commodity as per the purchasing price with a defined and agreed profit mark-up” (AAOIFI, 2005). This mark-up may be a percentage of the selling price or a lump sum. Moreover, according to the AAOIFI standard (2005), this transaction may be concluded either without a prior promise to buy, in which case it is called ordinary *murābaḥah*, or with a prior promise to buy submitted by a person interested in acquiring goods through the institution, in which it is called a “banking *murābaḥah*”, i.e., *murābaḥah* to the purchase orderer. This transaction is one of the trust-based contracts that depend on transparency as to the actual purchasing price or cost price in addition to common expenses.

*Murābaḥah* is the most popular contract in terms of use, since most Islamic commercial banks operating worldwide rely on this contract in generating income. Different dimensions of operational risk which can arise in a *murābaḥah* transaction are as follows:

- *Shari'ah* non-compliance risk (SR): SR may arise if the Islamic banks give money instead of commodity, which will then result in the exchange of money with money. This is prohibited in *Shari'ah*, since

the exchange of money with money plus an additional amount above the principal and paid at different times will tantamount to *ribā*. The AAOIFI *Shari'ah* standard (2005) also requires Islamic banks to own, legally, the commodity before they sell it to customers. It is important to note that the sequence of the contract is very central in *murābaḥah* transaction. Inability or failure to conform to the sequence and other *Shari'ah* requirements will result in the transaction deemed illegitimate.

- Fiduciary risk (FR): This risk arises due to the inability to meet the specified commodity stipulated in the contract.
- People risk (PR): The risk can result from two sides, seller as well as buyer. PR from the seller side occurs if Islamic banks fail to deliver the specified product agreed in the contract on the due date, while PR from the buyer side takes place when the buyers does not keep their promise to buy the commodity. This can happen in the binding *murābaḥah* contract.
- Legal risk (LR): Profit originated from *murābaḥah* cannot be equated with interest, although it looks similar. The main difference is that the resulting profit is tied with the underlying commodity. In certain countries the regulators only give limitation on interest rate, not profit rate. Hence, the absence of so-called 'profit rate cap' has the potential to create legal problems if there is any dispute. Another potential problem can occur at the contract signing stage, since the contract requires the Islamic bank to purchase the asset first before selling it to the customer, the bank needs to ensure that the legal implications of the contract properly match the commercial intent of the transactions

## 5.2 SALAM AND PARALLEL SALAM

The AAOIFI *Shari'ah* standards (2005) define *salam* as a transaction of the purchase of a commodity for deferred delivery in exchange for immediate payment. It is a type of sale in which the price, known as the *salam* capital, is paid at the time of contracting while the delivery of the item to be sold, known as *al-muslim fīhi* (the subject matter of a *salam* contract), is deferred. The seller and the buyer are known as *al-muslim ilayhi* and *al-muslim* or *rabb al-salam* respectively. *Salam* is also known as *salaf*. Parallel *salam* occurs when the seller enters into a separate *salam* contract with a third party to acquire goods, the specification of which corresponds to that of the commodity specified in the first *salam* contract (AAOIFI, 2005). Alternatively, parallel *salam*

TABLE 2  
The Dimensions of Operational Risk in Islamic Financial Contracts

Contracts	Internal Risk		External Risk
	Shari'ah Non-Compliance Risk (SR)	Fiduciary Risk (FR)	
<i>Murabahah</i>	<ul style="list-style-type: none"> <li>▪ Exchange of money and commodity need to be ensured</li> <li>▪ In the event of late payment, penalty must be avoided as it will tantamount to <i>riba</i>.</li> </ul>	<p>Inability to meet the specified product stipulated in the contract</p>	<p>Products to be sold must be legally owned by the bank</p>
<i>Salam</i>	<ul style="list-style-type: none"> <li>▪ Final payment of monetary rewards must be concluded in advance</li> <li>▪ Penalty clause is illegitimate in the event of seller's default in delivering the goods</li> <li>▪ In parallel <i>salam</i>, execution of second <i>salam</i> contract is not contingent on the settlement of the first <i>salam</i> contract</li> </ul>	<ul style="list-style-type: none"> <li>▪ Inability to meet the specified product stipulated in the contract.</li> <li>▪ Delivery of inferior goods cannot be accepted</li> </ul>	<p>Goods must be delivered when it is due, as agreed in the contract</p>
<i>Istisna'</i>	<ul style="list-style-type: none"> <li>▪ Should not be used as a legal device, e.g. the party ordering the product to be produced is the manufacturer himself</li> <li>▪ In parallel <i>istisna'</i>, contracts should be separated to avoid two sales in one deal</li> </ul>	<p>Need to ensure the quality standard of the product</p>	<p>Disagreement with the sub-contractor or the customer in the event of remedying defects</p>

TABLE 2 (continued)  
The Dimensions of Operational Risk in Islamic Financial Contracts

Contracts	Internal Risk			External Risk
	<i>Shari'ah</i> Non-Compliance Risk (SR)	Fiduciary Risk (FR)	People Risk (PR)	Legal Risk (LR)
<i>Ijarah</i>	<ul style="list-style-type: none"> <li>▪ Need to ensure that leased asset is used in a <i>Shari'ah</i> compliant manner</li> <li>▪ In <i>ijarah muntahia bittamleek</i>, an option to purchase cannot be enforced.</li> </ul>	Major maintenance of the leased asset is the responsibility of the banks or any party acting as lessor.	Lessor needs to understand that in the event of payment delay, rental due cannot be increased as clearly exemplified by AAOIFI	Enforcement of contractual right to repossess the asset in case of default or misconduct by the lessee
<i>Musharakah</i>	Profit allocation is based on actual profit, not expected profit	Inadequate monitoring of the financial performance of the venture	Lack of technical expertise in assessing the project	A mixture of shares in one entity may lead to legal risk if the regulation does not facilitate such action
<i>Mudharabah</i>	Profit allocation is based on actual profit, not expected profit	Inadequate monitoring of the business	Inability to provide regular and transparent account of financial performance of the project	Misinterpretation of civil law upon implementation of <i>Shari'ah</i> compliant <i>mudharabah</i>

Source: Authors' own

may also occur when a *salam* buyer enters into another separate *salam* contract with a third party to sell an amount of the commodity equivalent to hedge himself against commodity price fluctuations.

- *Shari'ah* non-compliance risk (SR): One of the very central conditions in *salam* contract is that payment of *salam* capital must be paid full in advance. If payment is delayed, the transaction is not called *salam* (AAOIFI, 2005, 172). Any delay in payment of the capital and dispersal of the parties renders the transaction a sale of debt for debt, which is prohibited, and the scholars agreed on its prohibition (AAOIFI, 2005, 172). Another aspect, which might lead to SR may also occur in parallel *salam*; this will take place if the execution of the second *salam* contract is contingent on the execution of the first *salam* contract. A penalty clause is also not allowed, in the event of a seller's default in delivering the good. The basis for not allowing penalty in *salam* is because *al-muslam fihi* (the subject matter of a *salam* contract) is considered to be a debt; hence it is not permitted to stipulate payment in excess of the principal amount of the debt (AAOIFI, 2005, 173).
- Fiduciary risk (FR): *Salam* is generally associated with the agricultural sector. The buyer must either reject goods of an inferior quality to that specified in the contract, or accept them at the original price. In the latter case, the goods would have to be sold at a discount (unless the customer under a parallel *salam* agrees to accept the goods at the originally agreed price).
- People risk (PR): PR can arise due to a seller's default in delivering the commodity or due to the commodity's specification mismatching. Financial institutions may minimize such type of operational risk by asking from the seller guarantees that they are following a quality management system or following any standard system, or by asking for references on past promises on *salam* contract or by collateralizing their losses via insurance policies.
- Legal risk (LR): Islamic banks may face legal risk if the goods cannot be delivered at the specified time (unless the customer under parallel *salam* agrees to modify the delivery date).

### 5.3 *ISTISNĀ'* AND PARALLEL *ISTISNĀ'*

*Istisnā'* is another type of forward contract, but the role of an Islamic bank as a financial intermediary in an *istisna'* contract differs from that in a *salam* contract. In this case, the bank contracts to supply a constructed asset (such as a building or a ship) for a customer. In turn, the bank enters into a parallel *istisna'* with a sub-contractor in order to

have the asset constructed. Its reliance on the parallel *istisnā'* counterparty (the sub-contractor) exposes it to various operational risks, which need to be managed by a combination of legal precautions, due diligence in choosing sub-contractors, and technical management by appropriately qualified staff or consultants of the execution of the contract by the sub-contractor. Islamic banks that specialize in *istisnā'* financing may have an engineering department. Risks may include the following:

- *Shari'ah* non-compliance risk (SR): SR could arise if *istisnā'* is used as a legal device for mere interest-based financing. For instance, an institution buys items from the contractor on a cash payment basis and sells them back to the manufacturer on a deferred payment basis at a higher price, or where the party ordering the subject matter to be produced is the manufacturer himself, or where one-third or more of the facility in which the subject matter will be produced belong to the customer. All the circumstances mentioned above would make the deal an interest-based financing deal in which the subject matter never genuinely changes hands, even if the deal is won through competitive bidding. This rule is intended to avoid sale and buy back transactions (*bay' al-'inah*). In parallel *istisnā'*, the separation of contracts is a must; hence this is not an instance of two sales in one deal, which is prohibited.
- Fiduciary risk (FR): The sub-contractor may fail to meet quality standards or other requirements of the specification, as agreed with the customer under the *istisnā'* contract.
- People Risk (PR): This may arise if the Islamic bank may be unable to deliver the asset on time, owing to time overruns by the sub-contractor under the parallel *istisnā'*, and may thus face penalties for late completion.
- Legal risk (LR): Islamic banks may face legal risk if no agreement is reached with the sub-contractor and the customer either for remedying defects or for reducing the contract price.

#### 5.4 IJĀRAH AND IJĀRAH MUNTAHIYAH BI AL-TAMLĪK

In simple terms, an *ijārah* contract is an operating lease, whereas *ijārah muntahiyah bi al-tamlīk* is a lease to purchase. While operational risk exposures during the purchase and holding of the assets may be similar to those in the case of *murābahah*, other operational risk aspects include the following:

- *Sharī'ah* non-compliance risk (SR): The Islamic banks need to ensure that the asset will be used in a *Sharī'ah*-compliant manner. Otherwise, it is exposed to non-recognition of the lease income as permissible.
- Fiduciary risk (FR): Major maintenance is the responsibility of the Islamic bank as the lessor, as directed by the AAOIFI *Sharī'ah* standards (2005, 154). In addition to that, it is the duty of the lessor to ensure that the usufruct is intact, and this is not possible unless the asset is maintained and kept safe so that the lessor may be entitled to the rentals in consideration for the usufruct. Thus, deficiencies in maintaining such responsibilities can be deemed to be sources of FR in *ijārah* contract.
- People risk (PR): The lessor is not allowed to increase the rental due in case of delay of payment by the lessee; this is what the AAOIFI (2005) clearly exemplifies. Misunderstanding of this principle by Islamic bank staff is a source of losses caused by PR, because the income generated from this is not permissible from the *Sharī'ah* point of view.
- Legal risk (LR): The Islamic bank may be exposed to legal risk in respect of the enforcement of its contractual right to repossess the asset in case of default or misconduct by the lessee. This may be the case particularly when the asset is a house or apartment that is the lessee's home, and the lessee enjoys protection as a tenant.

### 5.5 MUSHĀRAKAH

*Mushārahah* is a profit-and-loss-sharing partnership contract. The Islamic bank may enter into a *mushārahah* with a customer for the purpose of providing a *Sharī'ah* compliant financing facility to the customer on a profit-and-loss-sharing basis. The customer will normally be the managing partner in the venture, but the bank may participate in the management and thus be able to monitor the use of the funds more closely. Typically, a diminishing *mushārahah* will be used for this purpose, and the customer will progressively purchase the bank's share of the venture. Operational risks that may be associated with *mushārahah* investments are as follows:

- *Sharī'ah* non-compliance risk (SR): The source of SR may arise due to the final allocation of profit taking place based on expected profit. The AAOIFI (2005, 205) demands that it is necessary that the allocation of profit is done on the basis of actual profit earned through actual or constructive valuation of the sold assets.

- Fiduciary risk (FR): Any misconduct or negligence of the partners is the source of FR. This can happen in the absence of adequate monitoring of the financial performance of the venture.
- People risk (PR): Lack of appropriate technical expertise can be a cause of failure in a new business activity.
- Legal risk (LR): An Islamic bank which enters into *mushārah* contract needs to acquire some shares from a separate legal entity that undertake *Sharī'ah*-compliant activities. A mixture of shares in one entity may lead to legal risk if the regulation does not allow doing such action.

## 5.6 MUDĀRABAH

*Mudārabah* is a profit-sharing and loss-bearing contract under which the financier (*rabb al-māl*) entrusts his funds to an entrepreneur (*mudārib*). The exposure of operational risk in *mudārabah* is somewhat similar to that of *mushārah*. However, since this type of contract may be used on the assets side of the balance sheet, as well as being used on the funding side for mobilizing investment accounts, the operational risk is first analyzed from the assets-side perspective and then from the funding side perspective (which is related to fiduciary risk)

### 5.6.1 ASSET-SIDE MUDĀRABAH

Contractually, an Islamic bank has no control over the management of a business financed through this mode; the entrepreneur having complete freedom to run the enterprise according to his best judgment. The bank is contractually entitled to share with the entrepreneur only the profits generated by the venture according to the contractually agreed profit sharing ratio. The entrepreneur as *mudārib* does not share any losses, which are borne entirely by the *rabb al-māl*. The *mudārib* has an obligation to act in a fiduciary capacity as the manager of the bank's funds, but the situation gives rise to moral hazard especially if there is information asymmetry—that is, the bank does not receive regular and reliable financial reports on the performance of the *mudārib*. Hence, in addition to due diligence before advancing the funds, the bank needs to take precautions against problems of information asymmetry during the period of investment.

### 5.6.2 FUNDING SIDE *MUDĀRABAH*

The profit-sharing (and loss-bearing) investment account is a *Sharī'ah* compliant alternative to conventional interest-bearing deposit account. Since a *muḍārabah* contract is employed between the Islamic bank and its investment account holders, the investment account holders (IAHs) share the profits and bear all losses without having any control or rights of governance over the Islamic bank. In return, the Islamic bank has fiduciary responsibilities in managing the IAHs' funds. The IAHs typically expect returns on their funds that are comparable to the returns paid by competitors (both other Islamic banks and conventional institutions), but they also expect the Islamic bank to comply with *Sharī'ah* rules and principles at all times. If the Islamic bank is seen to be deficient in its *Sharī'ah* compliance, it is exposed to the risk of IAHs withdrawing their funds and, in serious cases, of being accused of misconduct and negligence. In the latter case, the funds of the IAHs may be considered to be a liability of the Islamic bank, thus jeopardizing its solvency.

## 6. CAPITAL REQUIREMENTS FOR OPERATIONAL RISKS

Prior to discussing the measurement of capital requirement for operational risks in Islamic banks, it is important to understand why banks should have adequate capital. For this reason, the first part of this section attempts to elucidate the rationale behind capital adequacy requirement. This also explains, briefly, the relationship between bank capitalization and risk taking behavior. Following to the discussion in the first part, the subsequent second and third parts discuss the measurement of capital attribution for operational risks and operational risk capital charge in Islamic banks, respectively.

### 6.1 WHY DO BANKS NEED TO HOLD CAPITAL?

Traditionally, capital adequacy requirements have been imposed to ensure solvency. Following Maisel (1979, 1981) and Merton (1979), a bank can be declared 'insolvent' or 'bankrupt' when the market value of the bank liabilities to depositors, computed by assuming that the

bank's obligations to depositors would be fully met, exceeds the market value of the bank assets reduced by the costs of liquidation. In other words, negative net worth (based on market values) implies insolvency. For this reason banks generally attempt to boost their risk-based capital ratios by means of (a) increasing the measures of regulatory capital appearing in the numerators of the leverage ratio, or (b) decreasing the regulatory measures of total risk appearing in the denominators (e.g., total risk-weighted assets). Jones (2000) suggests that in the short run, most banks have tended to react to capital pressures in the ways broadly envisioned by the framers of the Accord. That is, by increasing their capacity to absorb unexpected losses through increased earnings retention or new capital issues, and by lowering their assumed risks through reductions in loans and other footings.

The relationship between banks' capitalization and risk taking behavior is one of the central issues in banking literature because of the potential implications for regulatory policies. The minimum capital requirement, which currently constitutes the core regulatory instrument for the banking industry is based on the premise that increased capital enhances bank safety (Jeitschko and Jeung, 2007). As also discussed in Jeitschko and Jeung (2005), however, this premise may not hold under some relevant circumstances. Indeed, if increased capital induces a bank to increase asset risk (asset substitution effect of capital), and this effect supersedes the buffer effect of capital (larger capital absorbs more risk), then it is possible that a more highly capitalized bank has a higher probability of failure. This risk taking behavior of banks related to capitalization explains why banks often experience rapid, large declines in their capital-to-asset ratio (CAR), and are classified by regulators from well capitalized to troubled banks in as little as a single reporting period. The implication of this positive relationship between risk taking and capitalization is that capital regulation alone may not be adequate to guarantee the soundness of the banking business.

## 6.2 MEASUREMENT OF OPERATIONAL RISK BASED CAPITAL

Basel II implemented an additional add-on to capital for operational risk. Prior to this proposal, the Basel Committee on Banking Supervision (BCBS) had argued that operational risk exposures of banks were adequately taken care of by the 8% credit risk-adjusted ratio. But,

increased visibility of operational risk in recent years has induced regulators to propose a separate capital requirement for credit and operational risks. The BCBS now believes that operational risk is sufficiently important for banks to devote resources to quantify such risk and to incorporate them separately into their assessment of their capital adequacy. In the 2001 and 2003 Consultative Documents, the Basel Committee outlined three specific methods by which banks can calculate capital to protect against operational risk: the Basic Indicator Approach (BIA), the Standardized Approach (SA), and the Advanced Measurement Approach (AMA).

The Basic Indicator Approach is structured so that banks, on average, will hold 12% of their total regulatory capital for operational risk. This 12% target is based on a widespread survey conducted internationally of current practices by large banks.<sup>3</sup> To achieve this target, the Basic Indicator Approach focuses on the gross income of the bank, that is, its net profits. This equals a bank's net interest income plus net non-interest income:

$$(1) \text{ Gross Income} = \text{Net Interest Income} + \text{Net NonInterest Income}$$

According to the BCBS calculations, a bank that holds a fraction  $\alpha$  of its gross income for operational risk capital, where  $\alpha$  is set at 15%, will generate enough capital for operational risk such that this amount will be 12% of its regulatory capital holdings against all risks (i.e., credit, market, and operational risks). For example, under the Basic Indicator Approach:

$$(2) \text{ Operational Capital} = \alpha \times \text{Gross Income} \\ = .15 \times \text{Gross Income}$$

The problem with the Basic Indicator Approach is that it is too aggregative, or 'top-down', and does not differentiate at all among different areas in which operational risks may differ (e.g., Payment and Settlement may have a very different operational risk profile from Retail Brokerage). A second issue is that  $\alpha$  implies operational risk that is proportional to gross income. This ignores, according to Saunders and Cornett (2008), possible economies of scale effects that would make this relationship nonlinear (non-proportional); that is,  $\alpha$  might fall as bank profits and/or size grows.

In an attempt to provide a finer differentiation of aspects of operational risk in a bank across different activity lines while still retaining a basically top-down approach, the BCBS offers a second method for operational capital calculation. The second method, the Standardized Approach, divides activities into eight major business units and lines. Within each business line, there is a specified broad indicator  $\beta$ , which reflects the scale or volume of a bank's activities in that area. The indicator relates to the gross income reported for a particular line of business. It serves as a rough proxy for the amount of operational risk within each of these lines. A capital charge is calculated by multiplying the  $\beta$  for each line by the indicator assigned to the line and then summing these components. The  $\beta$  reflects the importance of each activity in the average bank. The  $\beta$  is set by regulators and is calculated from average industry figures from a selected sample of banks.

Suppose gross income from the Corporate Finance line of business (the activity indicator) is £30 million and the industry  $\beta$  for Corporate Finance is 18%. Then, the regulatory capital charge for this line for this year is:

$$\begin{aligned} (3) \text{ Capital}_{\text{Corporate Finance}} &= \beta \times \text{Gross Income from the Corporate} \\ &\quad \text{Finance line business for the bank} \\ &= .18 \times \text{£30 million} \\ &= \text{£5,400,000} \end{aligned}$$

The total capital charge is calculated as the three-year average of the simple summation of the regulatory capital charge across each of the eight business lines.<sup>4</sup>

The third method, the Advanced Measurement Approach, allows individual banks to rely on internal data for regulatory capital purposes subject to supervisory approval. Under the Advanced Measurement Approach, supervisors require the bank to calculate its regulatory capital requirement as the sum of expected loss (EL) and unexpected loss (UL) for each event type. Internally generated operational risk measures used for regulatory capital purposes must be based on a minimum three-year observation period of internal loss data, whether the internal loss data are used directly to build the loss measure or to validate it. A bank's internal loss data must be comprehensive in that the data capture all material activities and exposures from all appropriate subsystems and geographic locations. Risk measures for different operational risk estimates are added for purposes of calculating the regulatory minimum capital requirement.

### 6.3 OPERATIONAL RISK CAPITAL CHARGE IN ISLAMIC BANKS

The proposed measurement of capital to cater for operational risk in Islamic banks is also adopting the methods set by the BCBS. As the IFSB (2005b, 17) mentions in its standards, the calculation of operational risk-based capital in Islamic banks “may be based on either the Basic Indicator Approach or the Standardized Approach as set out in Basel II”. However, there is dissimilarity with regards to the use of the Standardized Approach (SA), since the IFSB (2005b) views that Islamic banks have a different structure of business lines. Hence, at the present stage, only the Basic Indicator Approach (BIA) can be adopted by Islamic banks. The BIA requires the setting aside of a fixed percentage of average annual gross income over the previous three years.

Problems of measurement is likely to arise due to lack of data, hence the extent of losses arising from non-compliance with *Shari'ah* rules cannot be ascertained. Therefore, the IFSB (2005b, 18) does not require Islamic banks to set aside any additional amount over and above the 15% of average annual gross income over the preceding three years for operational risk. Furthermore, in determining risk weights for operational risk, the IFSB (2005b, 18) recommends the exclusion of the share of profit sharing investment account holders from gross income, since Islamic banks share profits with their depositor-investors (Greuning and Iqbal, 2008).

## 7. CONCLUSION

Operational risk is a recent addition to the list of risks faced by financial institutions. The management of operational risk in Islamic banks is similar to that in conventional banks but includes several additional elements. In addition, due to the unique features of their financial contracts, operational risk in Islamic banks can be substantially different to what is exposed to conventional ones. The relative complexity of contracts, combined with the fiduciary obligations of Islamic banks, imply that for Islamic banks, operational risk is a very important consideration. More importantly, *Shari'ah* compliance risk as part of operational risk is paramount to Islamic banks, which means Islamic banks must ensure, at all times, that all activities and products are in conformity with *Shari'ah* principles. It is, then, apparent that the dimension of operational risk exposure in Islamic banks is more sophisticated than in conventional banks.

Operational risk is now recognized as a type of risk that can contribute to significant losses in all financial institutions. For this reason, various techniques are being applied in banks today in order to measure and manage operational risk. The methods set out by the BCBS help Islamic banks determine their capital in order to absorb operational losses. However, due to the small size of Islamic banks compared to the overall financial industry, the more advanced methods in the calculation of operational risk-based capital is still not feasible to be implemented. The absence of significant amount of loss data is also one of the problems that hinder Islamic banks from implementing more sophisticated methods. Given the rapid growth of the Islamic financial industry, however, it is expected that the lack of data will not remain a major issue in the near future.

#### ENDNOTES

1. 'IIFS' stands for institutions (other than insurance companies) which offer only Islamic financial services. In many literatures, the term 'Islamic banks,' 'IIFS' or 'Islamic financial institutions' are used interchangeably. The IFSB opts to use IIFS in its publication.
2. 'DSN' stands for *Dewan Syariah Nasional*, which means National *Shari'ah* Board.
3. Research has found that the amount of capital held for operational risk according to these models will often exceed capital held for market risk and that the largest banks could choose to allocate several billion dollars in capital to operational risk. See Defontnouvelle, et al. (2006).
4. The Basel's Committee's Loss Data Collection Exercise for Operational Risk (March 2003), based on data provided by 89 banks from 19 countries, revealed that about 61% of operational loss events occurred in the retail area, with an average loss of \$79,300. Also, only 0.9% of operational loss events occurred in the corporate finance area, but with an average loss of \$646,600.

#### REFERENCES

- Accounting and Auditing Organisation for Islamic Financial Institutions. *Shari'ah Standards*. Manama: AAOIFI, 2005.
- Ahmed, H. "Operational Structure for Islamic Equity Finance: Lessons from Venture Capital." *Research Paper No. 69*. Jeddah: Islamic Research and Training Institute, Islamic Development Bank, 2005.

- Akkizidis, I., and S.K. Kumar. *Financial Risk Management for Islamic Banking and Finance*. Hampshire: Palgrave Macmillan, 2008.
- Alexander, Carol. (Ed.). *Operational Risk: Regulation, Analysis and Management*. London: Prentice Hall, 2003.
- Ali, Ahmad. *The Emerging Islamic Financial Architecture: The Way Ahead*. Paper presented at the Fifth Harvard University Forum on Islamic Finance, Harvard University, USA, 6-7 April 2002.
- Alvarez, G. "Operational Risk Event Classification," 2002. <http://www.garp.com>. Access date 27 July 2007.
- Archer, S., and A. Haron. "Operational Risk Exposures of Islamic Banks." In *Islamic Finance: The Regulatory Challenge*, edited by Simon Archer, and R.A.A. Karim. Chichester: John Wiley & Sons (Asia) Pte Ltd, 2007.
- Aziz, Zeti Akhtar. (2006). "Building a Robust Islamic Financial System." Keynote address by the Governor of the Central Bank of Malaysia, at the 2nd International Conference on Islamic Banking, Kuala Lumpur, 7 February 2006. <http://www.bis.org/review/r060208e.pdf>. Access date 27 August 2008.
- Basel Committee on Banking Supervision. "Consultative Document: Operational Risk," 2001. <http://www.bis.org>. Access date 5 May 2007.
- Chachi, A. "Origin and Development of Commercial and Islamic Banking Operations." *Journal of King Abdul Aziz University* 18, no. 2 (2005): 3-25.
- Chapra, U., and T. Khan. "Regulation and Supervision of Islamic Banks." *Occasional Paper No. 3*. Jeddah: Islamic Research and Training Institute, Islamic Development Bank, 2000.
- Cihak, M., and H. Hesse. "Islamic Banks and Financial Stability: An Empirical Analysis." *Working Paper No. 08/06*. Washington: International Monetary Fund, 2008.
- De Fontnouvelle, P., V. De-Jesus-Rueff, J. Jordan., and E. Rosengren. "Using Loss Data to Quantify Operational Risk." *Working Paper*, Federal Reserve Bank of Boston, 2003.
- . "Capital and Risk: New Evidence on Implications of Large Operational Losses." *Journal of Money, Credit, and Banking* 38 (2006): 1819-46.
- Djojosingito, Reza. "Mitigating Legal Risk in Islamic Banking Operations." *Humanomics* 24, no. 2 (2008): 110-21.

- Dowd, V. "Measurement of Operational Risk: The Basel Approach." In *Operational Risk: Regulation, Analysis and Management*, edited by Carol Alexander, 31-48. London: Prentice Hall, 2003.
- Ebrahim, M.S. "Book Review on Interest in Islamic Economics." *Review of Islamic Economics* 11, no. 1 (2007): 149-53.
- Edwardes, W. "Risk Issues in Islamic Banking." Paper presented at the *Islamic Banking Conference*. Organized by Bank of England, 2002.
- Fiennes, T. "Supervisory Implications of Islamic Banking: A Supervisor's Perspective." In *Islamic Finance: The Regulatory Challenge*, edited by Simon Archer, and R.A.A. Karim. Chichester: John Wiley & Sons (Asia) Pte Ltd, 2007.
- Greuning, H.V., and Z. Iqbal. *Risk Analysis for Islamic Banks*. Washington: World Bank, 2008.
- Hadjiemmanuil, C. "Legal Risk and Fraud: Capital Charges, Control and Insurance." In *Operational Risk: Regulation, Analysis and Management*, edited by Carol Alexander. London: Pearson Education Limited, 2003.
- Hamidi, M.L. "The Theory and Practice of Islamic Management Style: The Experience of Bank Muamalat Indonesia." *Review of Islamic Economics* 10, no.2 (2006): 115-31.
- Hassan, M.K., and M.F. Dicle. "Basel II and Capital Requirements for Islamic Banks." Paper presented at the 6<sup>th</sup> *International Conference at Islamic Economics, Banking and Finance*, organized by Islamic Research and Training Institute-Islamic Development Bank, Bank Indonesia, and Ministry of Finance Republic of Indonesia, 21-24 November 2005.
- Heck, G.W. *Charlemagne, Muhammad, and the Arab Roots of Capitalism*. Berlin: Walter de Gruyter, 2006.
- Hoffman, D.G. *Managing Operational Risk: 20 Firmwide Best Practice Strategies*. New York: John Wiley & Sons, Inc, 2002.
- Hossain, R. "Integrated Operational Risk Management." In *Islamic Financial Architecture: Risk Management and Financial Stability*, edited by T. Khan, and D. Muljawan. Jeddah: Islamic Research and Training Institute, Islamic Development Bank, 2005.
- Hull, J.C. *Risk Management and Financial Institutions*. New Jersey: Pearson Prentice Hall, 2007.
- Hussain, A. *Managing Operational Risk in Financial Markets*. Oxford: Butterworth-Heinemann, 2000.

- Iqbal, M., and P. Molyneux. *Thirty Years of Islamic Banking: History, Performance and Prospects*. Hampshire: Palgrave Macmillan, 2005.
- Iqbal, Z. "Comments on Basel II and Capital Requirements for Islamic Banks" (M. Kabir Hassan and Mehmet F. Dicle), "Basel II: Implications for Islamic Banking" (Monzer Kahf), and "Cyclical Pattern in Profits, Provisioning and Lending of Islamic Banks and Procyclicality of the New Basel Capital Requirements" (Abd. Ghafar b.Ismail and Ahmad Azam b. Sulaiman). Paper presented at the 6<sup>th</sup> *International Conference at Islamic Economics, Banking and Finance*, organized by the Islamic Research and Training Institute-Islamic Development Bank, Bank Indonesia, and Ministry of Finance Republic of Indonesia, 21-24 November 2005.
- Iqbal, Z., and A. Mirakhor. *An Introduction to Islamic Finance: Theory and Practice*. Chichester: John Wiley & Sons, Inc, 2007.
- Islamic Financial Services Board. "Guiding Principles of Risk Management for Institutions (Other than Insurance Institutions) Offering Only Islamic Financial Services," 2005a. <http://www.ifsb.org>. Access date 11 December 2007.
- . "Capital Adequacy Standard for Institutions (Other than Insurance Institutions) Offering Only Islamic Financial Services," 2005b. <http://www.ifsb.org>. Access date 11 December 2007
- . "Disclosures to Promote Transparency and Market Discipline for Institutions Offering Only Islamic Financial Services (Excluding Islamic Insurance (Takaful) Institutions and Islamic Mutual Funds)," 2007a. <http://www.ifsb.org>. Access date 11 December 2007.
- . "Guidance on Key Elements in the Supervisory Review Process of Institutions Offering Only Islamic Financial Services (Excluding Islamic Insurance (Takaful) Institutions and Islamic Mutual Funds)," 2007b. <http://www.ifsb.org>. Access date 11 December 2007.
- Jackson-Moore, E. "Measuring Operational Risk." In *Islamic Finance: The Regulatory Challenge*, edited by Simon Archer, and R.A.A. Karim. Chichester: John Wiley & Sons (Asia) Pte Ltd, 2007.
- Jarrow, R.A. "Operational Risk." *Journal of Banking and Finance* 32, no. 5 (2008): 870-79.
- Jeitschko, T.D., and S.D. Jeung,. "Incentives for Risk Taking in Banking: A Unified Approach." *Journal of Banking and Finance* 29 (2005): 759-77.

- . “Do Well-Capitalised Banks take More Risk? Evidence from the Korean Banking System.” *Journal of Banking Regulation* 8, no. 4 (2007): 291-315.
- Jobst, A.A. “The Treatment of Operational Risk Under the New Basel Framework: Critical Issues.” *Journal of Banking Regulation* 8, no. 4 (2007): 316-52.
- Jones, D. “Emerging problems with the Basel Capital Accord: Regulatory Capital Arbitrage and Related Issues.” *Journal of Banking and Finance* 24 (2000): 35-58.
- Khan, F. *Essays in Islamic Economics*. Leicester: Islamic Foundation, 1995.
- Khan, T. *Risk Management in Islamic Banking: A Conceptual Framework*. Paper presented at Distance Learning Lecture, Islamic Research and Training Institute, Islamic Development Bank, 2004.
- , and H. Ahmed. “Risk Management: An Analysis of Issues in Islamic Financial Industry.” *Occasional Paper No. 5*. Jeddah: Islamic Research and Training Institute, Islamic Development Bank, 2001.
- King, J.L. *Operational Risk: Measurement and Modelling*. Chichester: John Wiley & Sons, Ltd., 2001.
- Kumar, S. “Islamic Banks: Operational Risk Dimension,” 2008. [http://www.irisunified.com/index.php/ger/publications/articles/operational\\_risk\\_in\\_islamic\\_banking](http://www.irisunified.com/index.php/ger/publications/articles/operational_risk_in_islamic_banking). Access date 25 August 2008
- Leippold, M., and P. Vanini. “The Quantification of Operational Risk.” *Working Paper No. 142*. National Centre of Competence in Research Financial Valuation and Risk Management, 2003.
- Maisel, S.J. “Risk and Capital Adequacy in Banks.” *Regulation of Financial Institutions Conference Series No. 21*. Federal Reserve Bank of Boston, 1979: 203-63.
- . *Risk and Capital Adequacy in Commercial Banks*. University of Chicago Press for the National Bureau of Economic Research, 1981.
- Marshall, C. *Measuring and Managing Operational Risks in Financial Institutions: Tools, Techniques and Other Resources*. Singapore: John Wiley & Sons, Inc., 2001.
- Merton, R.C. “Discussion in Regulation of Financial Institutions.” *Conference Series No. 21*. Federal Reserve Bank of Boston, 1979: 203-63.

- Mishkin, F.S. *The Economics of Money, Banking, and Financial Markets*. 7th edition. London: Pearson Addison Wesley, 2004.
- Mori, T., and E. Harada. "Internal Measurement Approach to Operational Risk Capital Charge." *Technical Report*. Bank of Japan, 2001.
- Muljawan, D. "A Design for Islamic Banking Rating System: An Integrated Approach." Paper presented at the 6<sup>th</sup> *International Conference at Islamic Economics, Banking and Finance*, Islamic Research and Training Institute-Islamic Development Bank, Bank Indonesia, and Ministry of Finance Republic of Indonesia, 21-24 November 2005.
- Nienhaus, V. "Comments on Basel II an Capital Requirements for Islamic Banks" (M. Kabir Hassan and Mehmet F. Dicle), "Basel II: Implications for Islamic Banking" (Monzer Kahf), and "Cyclical Pattern in Profits, Provisioning and Lending of Islamic Banks and Procyclicality of the New Basel Capital Requirements" (Abd. Ghafar b.Ismail and Ahmad Azam b. Sulaiman). Paper presented at the 6<sup>th</sup> *International Conference on Islamic Economics, Banking and Finance*, Islamic Research and Training Institute-Islamic Development Bank, Bank Indonesia, and Ministry of Finance Republic of Indonesia, 21-24 November 2005.
- . "Human Resource Management of Islamic Banks: Responses to Conceptual and Technical Challenges." In *Islamic Finance: The Regulatory Challenge*, edited by S. Archer and R.A.A. Karim. Chichester: John Wiley & Sons (Asia) Pte. Ltd., 2007.
- Saunders, A. and M.M. Cornett. *Financial Institutions Management: A Risk Management Approach*. 6th edition. New York: McGraw-Hill, 2008.
- Scott, H. "Legal Risk: The Operational Risk Problem in Microcosm," 2001. <http://www.bos.frb.org/bankinfo/conevent/oprisk/scott.pdf>. Access date 3 September 2008.
- Standard & Poor's. *Islamic Finance Outlook 2008*, 2008. <http://www.scribd.com/doc/2901342/Islamic-Finance-Outlook-2008>. Access date 19 August 2008.
- Sundararajan, V. "Risk Measurement and Disclosure in Islamic Finance and the Implications of Profit Sharing Investment Accounts." Paper presented at the 6<sup>th</sup> *International Conference at Islamic Economics, Banking and Finance*, Islamic Research and Training

Institute-Islamic Development Bank, Bank Indonesia, and University of Indonesia, 21-24 November 2005

———, and L. Errico. “Islamic Financial Institutions and Products in the Global Financial System: Key Issues in Risk Management and Challenges Ahead.” *Working Paper No. 02/192*. Washington: International Monetary Fund, 2002.

Van Greuning, H. and I. Zamir. *Risk Analysis for Islamic Banks*. Washington: World Bank, 2008.

Warde, I. *Islamic Finance in the Global Economy*. Edinburgh: Edinburgh University Press, 2000.

Zamorski, M.J. *Joint Supervisory Guidance on Operational Risk Advanced Measurement Approaches for Regulatory Capital—Board Memorandum*, 2003. <http://www.fdic.gov/regulations/laws/publiccomments/basel/boardmem-oprisk.pdf>. Access date 11 August 2008.