An analysis of capital regulation for Islamic banks

This item was submitted to Loughborough University's Institutional Repository by the/an author.

Additional Information:

- A Doctoral Thesis. Submitted in partial fulfillment of the requirements for the award of Doctor of Philosophy of Loughborough University.

Metadata Record: [https://dspace.lboro.ac.uk/2134/6803](https://dspace.lboro.ac.uk/2134/6803)

Publisher: © Dadang Muljawan

Please cite the published version.
This item is held in Loughborough University’s Institutional Repository (https://dspace.lboro.ac.uk/) and was harvested from the British Library’s EThOS service (http://www.ethos.bl.uk/). It is made available under the following Creative Commons Licence conditions.

For the full text of this licence, please go to: http://creativecommons.org/licenses/by-nc-nd/2.5/
This item is held in Loughborough University’s Institutional Repository (https://dspace.lboro.ac.uk/) and was harvested from the British Library’s EThOS service (http://www.ethos.bl.uk/). It is made available under the following Creative Commons Licence conditions.

For the full text of this licence, please go to: http://creativecommons.org/licenses/by-nc-nd/2.5/
An Analysis of Capital Regulation for Islamic Banks

by

DADANG MULJAWAN

A Doctoral Thesis
Submitted in partial fulfilment of the requirements for the award of
Degree of Doctor of Philosophy

Department of Economics
Loughborough University

2002

©Dadang Muljawan
Abstract

This thesis makes a theoretical contribution to the design of the capital adequacy assessment framework for Islamic banks. The proposed capital regulation is aimed at enhancing the Islamic banks' operational sustainability.

The first analytical section in the thesis discusses the nature of sharing contracts. The analysis helps to explain the current reluctance to use sharing contracts by the players in the Islamic banking system. Each individual will always try to optimise his utility, monetarily as well as religiously, as a form of compliance with religious rules. However, in an adverse condition, religious and risk-averse customers will compromise the two utility objectives (i.e. adopting hybrid types of contract that, to some extent, deliver his minimum required financial return besides also complying with religious norms).

The second analytical section in the thesis discusses possible improvements to the capital regulation of Islamic banks. This includes the possibility of enhancing the fiduciary as well as the agency roles performed by the Islamic banks. The analysis produces a number of propositions. The first proposition is to require the banks to have prudent assets-liabilities (capital) structures and to have adequate financial cushions. The second proposition is to require the shareholders of Islamic banks to observe a minimum level of financial participation; and to require the banks to disclose crucial financial information to investors. Theoretically, the higher the level of financial participation and the higher the quality of information provided, the better the quality of the contract entered into by the banks and their customers.

The last part of the discussion, embracing empirical analysis, shows the important role played by capital in absorbing temporary financial shocks (especially when debt-based deposits are dominant). The discussion also covers the possibility of using statistical techniques for assessing the soundness of Islamic banks' operational activities.
Acknowledgements

I would like to express my gratitude to my supervisor Dr. Maximilian J.B. Hall and to Dr. Humayon A. Dar who have provided guidance and information throughout my research. I also would like to thank Prof. David T. Llewellyn and Prof. John R. Presley for reviewing the earlier draft of this thesis; and also my dearest friend Dr. Kenneth Baldwin for beneficial discussion. I am also grateful to my sponsor Bank Indonesia, who has given me financial support.

And finally, the verses taken from the Holy Qur'an (96:1-8) make clear to whom thanks are due:

'Read! In the name of thy Lord and Cherisher, Who created-
Created man out of a leech-like clot:
Read! And Thy Lord is Most Bountiful,-
He Who taught (the use of) the Pen,-
Taught man that which he knew not.
Nay, but man doth transgress all bounds,
In that he looketh upon himself as self-sufficient.
Verily, to thy Lord is the return (of all)'}
# Table of Contents

## Chapter 1

### Introduction

1.1. Islamic banking ................................................................. 1  
1.2. Systemic stability and capital regulation .............................. 2  
1.3. Objectives of the research .................................................. 5  
1.4. Methodology of the research .............................................. 6  
1.5. Outline of the thesis ....................................................... 7  

## Chapter 2

### Financial regulation: A western framework

2.1. Introduction ........................................................................ 9  
2.2. The rationale for financial regulation ................................... 12  
2.3. Banking regulation .......................................................... 19  
   2.3.1. Regulation and governance ........................................ 20  
   2.3.2. International convergence of banking regulation(s) .......... 28  
      2.3.2.1. Supervisory review and market discipline .................. 30  
      2.3.2.2. Risk-based capital regulation ................................. 32  
2.4. Summary ........................................................................ 58  

## Chapter 3

### Islamic banking: Concepts and applications

3.1. Introduction ........................................................................ 61  
3.2. Islamic finance: Concept and application ............................ 62  
   3.2.1. Islamic principles in financial activities ....................... 62  
   3.2.2. Islamic financial activities .......................................... 68  
   3.2.3. Financial risk exposures of Islamic banks ..................... 76  
3.3. The current regulatory framework for Islamic banks ............ 86  


Chapter 4
Profit and loss sharing contracts: Concepts and applications
4.1. Introduction ................................................................. 112
4.2. Types of contracts in principal-agent analysis ..................... 114
   4.2.1. The choice of contract and the risk aversion level .......... 114
   4.2.2. Possible contractual problems ................................... 121
4.3. Religious preference and the optimality of contracts .................. 131
4.4. Types of contracts available in Islamic banks ....................... 138
   4.4.1. Sharing-based contracts ....................................... 138
   4.4.2. Hybrid contracts ............................................... 138
   4.4.3. Mark-up contracts ............................................ 139
4.5. Summary .................................................................. 140
Appendix 4.A. The derivation of the stochastic dominance

Chapter 5
The concept of capital for Islamic banks and the implications for capital adequacy requirements
5.1. Introduction ............................................................... 145
5.2. Financial structure of an Islamic bank ................................. 146
   5.2.1. The building blocks ............................................ 146
5.2.2. Contractual arrangement within an Islamic bank ............................... 153

5.3. The proposed capital adequacy regulation for Islamic banks .................. 156

5.3.1. A critique of the AAOIFI approach .............................................. 156

5.3.2. Possible improvements ........................................................... 159

5.3.3. The implications of the minimum capital ratio requirements .......... 164

5.3.4. Other aspects supporting sound capital adequacy regulation (Pillars 2
and 3 of the new Basel Committee) ................................................ 167

5.4. Safety net arrangements and systemic stability .................................... 171

5.5. Summary ................................................................................ 176

Appendix 5. A. Mathematical simulation of capital adequacy using the
AAOIFI’s standards

Appendix 5. B. Stochastic effect in the analysis of shareholder value

Appendix 5. C. Financial participation in a sharing contract

Appendix 5. D. Simulation of the proposed capital regulation

Appendix 5. E. Stochastic effect in shareholder value under safety net
arrangements

Chapter 6

Empirical analysis of Islamic banking operations as exemplified by one Indonesian
Islamic bank

6.1. Introduction ........................................................................ 192

6.2. The building blocks ................................................................. 193

6.2.1. Surplus allocation scheme .................................................. 193

6.2.2. The liabilities side of the bank .......................................... 194

6.2.3. The assets side of the bank ................................................. 200

6.3. Prudential operations ............................................................... 201

6.3.1. Assets and liabilities structure ............................................. 201

6.3.2. Fixed claimed asset quality assessment and capital adequacy ..... 202

6.3.3. Variable-claim types of asset and the expected return .......... 217

6.4. Summary ............................................................................. 220
Appendix 6.A. Composition of the Islamic bank’s liabilities (%)
Appendix 6.B. Statistical test to identify the types of depositors
Appendix 6.C. General asset composition of the bank
Appendix 6.D. Correlation test between factors relevant to credit migration
Appendix 6.E. Logistic regression results
Appendix 6.F. Statistical model for estimating returns of variable types of assets
Appendix 6.G. The calculation of risk weighted assets using an IRB approach

Chapter 7
Conclusions

7.1. Summary of the research and the empirical results ................................ 236
7.2. Recommendations for future research .............................................. 237

References
## Table of Exhibits

2.1. A comparison of the objectives of Islamic and western banking systems .... 9
2.2. Regulatory framework for the banking system ........................................ 20
2.3. Key players supporting good governance in a banking system ............... 21
2.4. Feedback by auditors .......................................................................... 27
2.5. Statistical assumptions underlying risk based capital adequacy assessment ... 36
2.6. The value of the firm .......................................................................... 39
2.7. Absolute risk aversion .......................................................................... 40
2.8. Banking risk spectrum .......................................................................... 43

3.1. Sharing-based modes of financing .......................................................... 70
3.2. Non sharing-based modes of financing .................................................. 71
3.3. Comparison of banking frameworks ..................................................... 72
3.4. Comparative features of Islamic financing techniques ............................ 74
3.5. Determining aspects for investments in a stock market ............................ 81
3.6. A comparison of financial risks facing conventional and Islamic banks ... 86
3.7. The fiqh concept of regulation ............................................................... 87
3.8. General objectives of a supervisory framework for Islamic banks ........... 89
3.9. Shift in focus of Islamic banking supervision ........................................ 91
3.10. The relevance of the core principles for effective banking supervision outlined by the Basle Committee to Islamic banking supervision ............... 93
3.11. The adoption of banking standards by Islamic banking regulators .......... 94
3.12. A comparison of early warning systems .............................................. 95
3.13. Funds under management .................................................................... 99
3.14. Funds managed by Islamic institutions by region .................................. 99
3.15. Distribution of Islamic banks in terms of assets size and regions .......... 99
3.16. Distribution of Islamic banks in terms of profitability (ROA) and regions .. 100
3.17. Financing by modes .......................................................................... 100
5.7. Possible regulatory approach based on characteristics of deposits ............ 156
5.8. (a). Proportion of $EC$ to $PSIAu$ as a function of the ratio of $PSIAu$ to $TA$ ... 157
5.8. (b). Relative agency cost as a function of the ratio of $PSIAu$ to $TA$ .......... 158
5.9. Absolute risk aversion as a function of net asset value .......................... 163
5.10. The effect of imposing a minimum financial participation on shareholders
       (a). On relative agency costs ............................................ 165
       (b). On the relationship between the proportion of $EC$ to $PSIAu$ and the $PSIAu$ to $TA$ ratio ............................................................. 166
       (c). On the relationship between the proportion of $EC$ to $TA$ and the $PSIAu$ to $TA$ ratio ............................................................ 166
5.11. Risk management process in a closed loop control system ..................... 168
5.12. Shareholder value and the regulator’s liability ................................. 175

6.1. Investment cash-flow process for the Islamic bank ............................. 193
6.2. The bank’s liabilities structure: a further breakdown ......................... 195
6.3. The $EC$ to $TL$ ratio .................................................................. 195
6.4. Possible types of investors in Islamic banks ...................................... 196
6.5. Rates of return paid by Islamic banks and conventional banks .......... 197
6.6. Growth of depositors’ funds and differential rate of return ............... 199
6.7. Probability of depositors’ funds and level of deposit growth ............... 199
6.8. General asset composition of the bank ........................................... 201
6.9. Ratio of fixed claim assets to fixed claim liabilities ........................... 202
6.10. Historical general asset composition of the bank ............................... 203
6.11. Capital structure and profit and loss ............................................. 204
6.12. Percentage of non performing loans and industry production level ...... 205
6.13. Allowance for earning assets losses ............................................. 206
6.15. Capital adequacy ratio .................................................................. 208
6.16. Distribution of loan size during 1999 ............................................. 209
6.17. Methodology of probability calculation ......................................... 213
6.18. Probability of credit migration as a function of industry performance ....... 214
6.19. Benchmark Risk Weight (BRW) and Risk Weighted Assets (RWA) ............ 215
6.21. Three different types of sharing-based financing ................................. 217
6.22. Revenue, sharing ratio and revenue share ........................................... 218
6.23. Real and estimated revenue of the bank ............................................... 220
CHAPTER 1
INTRODUCTION

1.1. Islamic Banking

The need for alternative banking services by Muslim societies has sparked fierce debate in the last few decades. For a Muslim society, a western type banking system is un-Islamic since it involves activities which are not in accordance with their religious rulings. In order to fulfil their needs, there have been a vast number of Islamic banks (financial institutions) established. The first modern Islamic bank, the Mit Ghamr Saving Bank of Egypt, was established and came into operation in 1963. In 1971, the Nasir Social Bank of Egypt was declared an interest-free commercial bank although its charter made no reference to Islamic law (sharia). Then, in 1974, an inter-governmental Islamic bank, the Islamic Development Bank (IDB), was established to provide religiously-approved financial assistance to member countries. These developments have inspired Muslim societies in other countries to take similar steps. There have been many Islamic banking institutions established to deliver religiously-approved financial services to the Muslim society in many countries. In Indonesia, the desire of Muslim society to have Islamic financial institutions started well before the government legally supported the existence of Islamic banks. Such financial institutions are established by non-governmental-organisations.

Islamic banking is distinct from western banking in some major areas: the prohibition of usury in economic transactions; the prohibition of gambling (excessive speculative activities); and the prohibition of conducting investment activities in morally disapproved projects. Conceptually, Islamic banks should have a different basis of transaction and a different nature of contract because of the prohibition of usury in business transactions. The Islamic banks should be dominated by equity-based funds in
their capital bases (Khan and Chapra, 2000). The value of depositors’ funds represents the real assets value of the banks. Therefore, the Islamic banks conduct an agency role since the depositors are facing financial risks directly as a result of the banks’ business activities. In practice, not all depositors are willing to take risks. Some of the depositors require the banks to guarantee the repayment of the principal amount when it is called. In Indonesia, hybrid-based transactions (a mix between profit-and-loss sharing contracts and fixed claim contracts) are even more popular than the pure profit and loss sharing contracts). The Islamic banks are thus also conducting fiduciary roles. On the assets side, Islamic banks offer a wide range of products based on pure profit and loss sharing (or revenue), mark-up and a mix of the two products. The current development of Islamic banking can, however, be interpreted as making Islamic finance more relevant to the daily business operations of its customers.

1.2. Systemic Stability and Capital Regulation

The customers of Islamic banks expect to have safe and sound financial services. The religious aspect is, thus, not the only factor to consider. They need a sound financial environment, which enables them to conduct ethical business without being afraid of facing financial crises as a result of fraudulent practices. At the macro level, systemic stability has become a central theme. Islamic banking is an integral part of the financial system in many countries. The soundness of the banking system is essential to a robust economy. Experience in many countries shows that there is a strong relationship between banking system soundness and macroeconomic policy implementation and performance (Goodhart et.al. (1998)). Effective prudential supervision of the banking system is a key element of financial system surveillance. Sustainable banking supervision, which relates to the assessment and monitoring of banks’ financial performance and position, should be carried out through an effective regulatory

---

framework aimed at reinforcing banks’ operating environment, internal governance and market discipline.

According to Errico and Farahbaksh (1998), an appropriate regulatory framework for Islamic banking supervision should ensure that the legal foundations for Islamic banking supervision are in place, investment and other risks are adequately dealt with and that adequate information is disclosed. An Islamic banking system needs prudential supervision to reduce risks to the soundness of the banking system and to enhance the banks’ roles as active players in the development of the economy. From the supervisory point of view, an Islamic banking system should be a financially sound banking system besides ensuring compliance with Islamic rules (Khan and Chapra, 2000).

The establishment of an Islamic banking system is relatively new, when compared to western banking systems. The latter have long had established frameworks for regulation and supervision, which have been internationally recognised as satisfying minimum supervisory standards, as summarised in the Basel Committee’s “Core principles for effective banking supervision”. Islamic banking experts, as a matter of fact, can benefit from current developments in the western banking supervisory framework since there are some fundamental principles that should also be adopted by Islamic banking supervisors as minimum requirements for effective banking supervision. For example, the most recent capital adequacy proposals (Basle Committee, 2001a), which are designed to better align regulatory capital requirements to underlying risk, and to recognise the improvements recently made in risk measurement management and control, are relevant to Islamic banking. The Basle Committee’s proposals of January 2001 consist of three pillars: minimum capital requirements; supervisory review; and market discipline. However, although most western regulatory standards are still relevant as indicators of best practice for Islamic banks, the regulations set for Islamic banks should also reflect the basic operational differences between Islamic and western banks.
Islamic financial experts have long been aware of the need for International convergence in Islamic banking operations. An institution called the Accounting and Auditing Standards for Islamic Financial Institutions (AAOIFI) has been established. The purpose of the AAOIFI is to review the standards for Islamic-banking operations internationally so that Islamic banks from different countries can have the same operating guidelines. As a first stage, the AAOIFI has been successful in producing a set of sharia-based accounting standards that incorporates religious norms and products, which do not exist in western systems. Operationally, many banking systems have started to adopt the international accounting standards set by the AAOIFI. Currently, the AAOIFI has also started reviewing issues relating to the prudential regulation of Islamic banks. One of the central aspects which is being reviewed is a proper design of capital adequacy regulations for Islamic banks.

The rapid development of Islamic banking poses a challenge for the local banking authorities seeking to properly regulate Islamic banks. However, most national banking authorities still adopt the prudential standards outlined by the Basel Committee since an adequate regulatory framework designed for Islamic banks has not yet been devised. The Indonesian banking regulatory authority, for example, has also adopted the prudential standards outlined by the Basel Committee. The regulations set for Islamic banks, including capital adequacy requirements, heavily correspond with the regulations set for western banks.

A number of research institutes continuously review the set of prudential regulations applied to Islamic banks in order to improve the soundness of Islamic banking operations. Capital adequacy regulation has been one of its central preoccupations because of its important role in maintaining operational sustainability. As mentioned earlier, Muslim society should emphasise the profit-and-loss sharing concept in all economic activities. This includes loan financing, trading activities, etc. In practice, the adoption of profit-and-loss sharing transactions requires some preconditions, which cannot be met in most developing countries. The lack of adequate accounting standards
and poor information systems, for example, lead to informational problems. Hence, the concept of profit-and-loss-sharing has never been fully applied, except in a few countries. The current operation of Islamic banks shows how fixed-claim products dominate the liabilities of the Islamic banks since the depositors are not willing to fully share the losses with the banks (i.e. they want a guarantee on the principal amount). Therefore, the financial structure of Islamic banks is closer to the financial structure of western banks. This evidence shows the importance of having an appropriate capital adequacy regulation that can accommodate variability in business operations. Having taken account of these operational distinctions, the banking regulator should be able to enhance the soundness of the Islamic banking system, so that it can make a significant contribution to economic development. The regulations designed should also be able to improve stability in the long run.

The existence of Islamic banks should not place excessive burdens on the economy. As in western banking systems, financial crises in Islamic banking systems can potentially generate huge systemic costs. Further analysis regarding systemic regulation should therefore be elaborated, such as safety-net schemes (deposit insurance) and exit policy.

1.3. Objectives of the Research

The assessment of bank capital adequacy plays an important role in banking supervision. An adequate level of capital improves the capacity of a bank to absorb temporal shocks. For the regulator, capital adequacy has become one of the most important measures indicating the soundness of banking operations. In an extreme case, capital adequacy may become the determining factor in the liquidation process since insolvency may result in systemic instability and a high systemic cost to the government as the ultimate guarantor. Capital adequacy requirements should be designed to achieve two different objectives simultaneously. First, capital should be sufficient to maintain operational sustainability. Since the composition of their capital is different, Islamic banks should face different capital adequacy requirements than western banks. The
capital adequacy regulations for Islamic banks should take their capital structure into account. Second, the capital adequacy requirements should also encourage prudent behaviour by the banks.

This study is designed to do two things. First, to devise a regime of capital adequacy requirements that takes account of the characteristics of Islamic banks. Second, to identify building blocks that can be beneficial for further risk assessment techniques in Islamic banks.

1.4. Methodology of the Research

The research starts with the theoretical/literature review of the current development of western banking (financial) regulations. The review explores the rationale for and the objectives of the western financial regulations. The review also explores how statistical techniques can be used to support a supervisory process. The literature review then examines the current development of Islamic banking, in theory and practice, as well as the current development of a regulatory framework for Islamic banking.

The research continues with a basic analysis of the theory of contracts and information. The analysis leads to an understanding of the variability of the contracts and their applicability. The analysis explores the informational problems that may explain the diversion of Islamic banking operations from the paradigm version (i.e. why the depositors and the Islamic banks are, in practice, reluctant to engage in pure profit-and-loss sharing contracts).

These reviews and analysis support further analysis of the proper design of capital regulation for Islamic banks. The capital regulation should achieve two ultimate objectives. First, protecting risk-averse depositors from future losses (i.e. enhancing the banks’ fiduciary role). And second, improving the quality of behaviour of the banks. The analysis includes a consideration of the attitude of shareholders toward financial
risk using a stochastic analysis, and analysis of the extent of ‘financial participation’ by shareholders in the principal-agent relationship (i.e. to enhance the agency role of banks). The analysis undertaken addresses the pivotal position of the shareholders of a bank because of their power to control the bank’s management.

The analysis also assesses the relevance of the current risk assessment techniques implemented in western banking to Islamic banking practice. It also involves an empirical analysis of the risk assessment carried out by an Islamic bank in Indonesia. The analysis shows how the capital adequacy standards outlined by the Basel Committee are, to some extent, still relevant to Islamic banking.

1.5. Outline of the Thesis

The thesis proceeds as follows:

Chapter 1 outlines the scope and contribution of the thesis. The thesis makes, mainly, a theoretical contribution to the debate about the appropriate design of capital regulation for Islamic banks. The thesis also demonstrates the relevance of the western banking regulatory framework to Islamic banking.

Chapter 2 discusses the current development of western banking regulation, referring in particular, to the Basel regulatory standards. An Islamic bank is, basically, an intermediary financial institution that needs financial stability to perform its functions. Islamic banks, to some extent, can benefit from the development of the western regulatory framework since they, financially, perform similar functions. The purpose of this review is to extract the essence of the western banking regulation and show how this knowledge may contribute to the development of an Islamic banking regulatory framework.

Chapter 3 discusses the background to the needs of Muslim society for a religiously-approved financial system since Islamic teaching has its own principles concerning the
permissibility of financial activities. This chapter also describes the recent development of Islamic banking in general, including the current banking regulatory framework. This chapter demonstrates how current regulations, which are specially designed as a standard for prudent Islamic banking activities, are inadequate, with most banking regulators (including the Indonesian banking authorities) in Islamic countries simply adopting the western banking regulatory standards. Although some of the principles of the western banking regulatory framework may be relevant to Islamic banking, it is important to design a dedicated set of banking regulations that takes into account the characteristics of Islamic banks.

Chapter 4 examines the factors affecting the applicability of the profit-and-loss sharing contracts as compared with other types of contracts, like fixed-return contracts and revenue-sharing contracts. This chapter analyses the informational problems preventing full application of profit-and-loss-sharing contracts.

Chapter 5 explains the nature of the contracts used in Islamic banking operations. The analysis recognises the differences between the paradigm version and current Islamic banking practices. The formulation of capital adequacy requirements should be capable of supporting a sound financial structure and inducing prudent behaviour by shareholders. This chapter also analyses the interaction between the capital adequacy requirements, a possible safety net arrangement, and stochastic behaviour in the banking system.

Chapter 6 shows, empirically, the role of a bank’s capital adequacy in sustaining operational soundness. This chapter also shows how conventional risk assessment techniques are still relevant to Islamic banking operations.

Chapter 7 concludes the research.
CHAPTER 2
FINANCIAL REGULATION:
THE WESTERN FRAMEWORK

2.1. Introduction

In the theory of industrial organisation, an intermediary can be viewed as an agent who buys certain goods or services from producers and sells them to final consumers. Similarly, banks can be seen as financial securities retailers who buy securities issued by borrowers and sell them to lenders. Gurley and Shaw (1960), Benston and Smith (1976) and Fama (1980) state that banks exist to transform financial contracts and securities. Different desires of borrowers and lenders may be the most reasonable cause of the existence of the traditional banks. Summarising the arguments in western economics, Freixas and Rochet (1998) highlight important aspects relating to the existence of banks as intermediary institutions.

Transaction costs
One of a bank’s main roles is transforming deposits to non-marketable loans. A bank can be viewed as providing services of divisibility, term and risk transformation. Gurley and Shaw (1960) emphasise the transformation process of the credit portfolio demanded by borrowers into a deposit portfolio desired by lenders. A bank has two advantages in the transformation process. First, banks engage in term transformation. Surplus income units (household) prefer short-term deposits for liquidity reason while deficit spending units (firms) like to finance their projects with long term credit. Banks are able to facilitate those two different preferences though the firms could issue short term saving contracts. Second, banks are able to exploit efficiency gained from the payment system. A bank has to exceed a minimum level of efficiency and profitability to survive in the business. A bank may benefit from two economic efficiencies: economies of scale and economies of scope. The idea of economies of scope is that a bank may be more
efficient in providing wider varieties of financial products rather than narrower varieties. Although this idea does not apply to all financial intermediaries, it may be reasonable as an explanation for the existence of universal banking. A bank can also operate more efficiently after it exceeds a minimum scale of operation. The problem of large fixed transaction costs can be overcome by an increase in the volume of transactions.

Liquidity insurance
Banks can also be viewed as providing pools of liquidity that provide households with insurance against idiosyncratic shocks that affect their consumption needs. The idea of investment fund allocation starts from the concept of the use of some fractional deposits to finance profitable and illiquid investments. The banks should have an ability to maintain their liquidity against idiosyncratic shocks (as long as these shocks are not perfectly correlated) that might exceed the total cash reserve. Diamond and Dybvig (1983) show that the market economy does not provide perfect insurance against liquidity shocks and therefore it does not lead to an efficient allocation of resources. In their model, it is proven that in the condition in which agents are individually subject to independent liquidity shocks, the market allocation can be improved by a deposit contract offered by financial intermediaries.

Information-sharing coalition
In business activities, entrepreneurs usually have better information than the investors do. This ‘hidden information’ may lead to adverse selection for investors in choosing prospective projects. Banks can be viewed as information sharing coalitions that generate economies of scale in borrowing-lending activities. Campbell and Kracaw (1980) mention the natural monopoly aspect of information provision as the main competitive aspect. In their studies, Leland and Pyle (1977) have also shown that if

---

1 Bryant (1980) models the first notion of liquidity insurance. It captures the simplest model of fractional reserve system. The model optimizes the utility of the consumers in facing the possible liquidity shocks. If the return of the long run investment cannot guarantee the higher return of the short run investment, the consumer tend to maintain higher level of liquidity. In fact, the market cannot provide perfect insurance against liquidity shocks.
borrowers form partnerships, they are able to obtain better financing condition than by borrowing individually. It can be shown that the unit cost of capital decreases with the size of the coalition of borrowers.

**Banks as delegated monitors**

According to Diamond (1984), banks have comparative advantages to do monitoring activities due to efficiency. A bank can be viewed as a pool of funds that collect dispersed small financial resources to finance larger scale projects. When the banks can achieve economies of scale, they can deliver lower costs of delegations. The term ‘monitoring’ itself has a broad meaning (Hellwig, 1991). This includes screening projects (to avoid adverse selection), preventing moral hazard by the borrowers in realising the projects, and auditing the project (including punishment for contractual breaches).

**Exhibit 2.1**

*A comparison of the objective of Islamic and western banking system*

<table>
<thead>
<tr>
<th>Point of view</th>
<th>Islamic bank</th>
<th>Western bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government/banking regulator</td>
<td>Financial intermediaries that are capable of accelerating economic development through saving-investment process</td>
<td>Financial intermediaries that are capable of accelerating economic development through saving-investment process</td>
</tr>
<tr>
<td>Depositors</td>
<td>Delivering financial services that:</td>
<td>Delivering financial services that:</td>
</tr>
<tr>
<td></td>
<td>- safe</td>
<td>- safe</td>
</tr>
<tr>
<td></td>
<td>- efficient</td>
<td>- efficient</td>
</tr>
<tr>
<td></td>
<td>- religiously approved</td>
<td></td>
</tr>
</tbody>
</table>

Financially, Islamic banks exist for almost the same reasons. Exhibit 2.1 shows the comparison of the objectives of the existence of the two banking systems. At the macro level, the banking systems should be capable of sustaining economic development. At the micro level, the banking system should be capable of delivering safe and efficient financial services. The difference between the two lies only on the compliance to the
sharia rules. The question to answer is how should Islamic banking regulation be different from the western banking supervisory framework.

The establishment of Islamic banking is relatively new as compared to the western banking. The Islamic banking experts are in a search for an appropriate framework for banking supervision. The framework designed should incorporate financial and religious aspects simultaneously. The western banking has already had an established regulatory framework, which has been continuously reviewed in the last decades. Islamic banking experts, to some extent, can benefit from current development of western supervisory (and regulatory) framework. This chapter reviews the rationale behind financial regulations and current development of banking regulations in the western world.

2.2. The Rationale for Financial Regulation

Nowadays, the financial system plays very important roles in the activities of every community. The development in modern information technology has made the financial system integrated, not only regionally but also globally. There are a lot of benefits that can be gained from these developments, such as low transaction costs and reduced transactions time. Various financial instruments have also been developed to fit the needs of portfolio investment activities. On the other hand, financial integration has also concealed a lot of potential problems when the system is not ready for such developments. The financial system is becoming more vulnerable as a large amount of money, involving many depositors' interests, shifts easily from one instrument of portfolio investment to another; whilst at the same time, depositors do not have full information about the investment activities undertaken by financial agents.

Over the past decade, the banking system has changed radically. Entry barriers to the banking industry have eroded as competition has increased domestically as well as internationally. The challenge for competition does not only come from other banking
institutions but also from non-bank competitors that have begun to provide various alternative financial services. Moreover, recent technological and financial innovations have served to reduce information costs and to increase competition. The developments are eroding the market imperfections, which gave commercial banks their advantages over inter-mediation in direct credit markets. According to Eisenbeis (1990), important developments in the financial markets have been: the explosive growth of asset securitisation and contingent claims, and the internationalisation of financial markets. Following these developments in the financial markets, there have been two subsequent results. First, there has been a shift in the institutions who are participating in these markets away from traditional intermediaries towards securities firms and investment bankers skilled in the creation, design and distribution of these new derivative securities. Traditional banking activities will share a limited portion in the future, however, the banking industry with a more advanced characteristic will still exist. Second, it has been increasingly difficult for individual countries to maintain regulatory structures or regulations different from those in the rest of the world. The adoption of the standard banking supervisory and regulatory framework developed by the Bank for International Settlement (BIS) by most countries in the world is one example of the attempt for regulatory convergence.

Llewellyn (1997a) states that sound economic development\(^2\) requires two essential ingredients: an efficient financial system and a stable and robust financial system. An efficient financial system requires substantial liberalisation, that is a general policy that increases the market's role and allows for autonomous financial institution decision-making. A robust financial system requires three additional properties: proper decision-making and control within financial institutions with effective risk analysis, management and control systems; an efficient regulatory and supervisory regime for financial institutions; and sound incentive structures for all parties in the financial system. Setting the scene to address the economic rationale for the regulation of

---

\(^2\) In an economic system in which the capital market has not developed sufficiently to sustain the required level of savings/investment, the banking system seems to be a very important channel for developing the savings/investment process.
financial services, regulators should understand some general perspectives (Goodhart et al. (1998)). Regulators should recognise the needs of regulation, monitoring and supervision since they supply regulatory, monitoring and supervisory services to various stake-holders that might have different needs to fulfil; hence, the system might even be over-regulated. Over-regulation based upon inappropriate objectives might increase the economic costs, and also increase the price of financial services. The following three arguments can be considered as the main reasons why regulations are needed to shape a financial/banking system.

To protect the customer against monopolistic exploitation
Since banking and financial services are widely used by the public, the regulator must prevent monopoly practices by a private sector that allows them to exploit their own interests instead of providing appropriate financial services\(^3\). Those who command access to the use of markets or to the information that they generate may be in a position to monopolise the services and to exert unfair pressure favouring their own interests; hence, their action will distort the market. To some extent, the regulator must also exert some control over those activities that cover a broader area, including support facilities, such as financial information services and other areas that provide access to the market.

To provide retail (assume less informed) clients with protection
In the absence of prudential regulations, depositors are not sufficiently protected. They are not supplied with adequate information on how their funds are being used and they do not even know about the actual value of banks\(^4\). Nowadays, the finance industry as

---

\(^3\) As an industry, the banking system depends on suppliers in providing services. Suppliers in the banking system are not only the hardware providers (e.g. computers, furniture) but also the subcontractors of some parts of banking activities. The subcontracting of some part of banking activities, like information processing, is done in order to achieve a higher level of efficiency and ultimately greater competitiveness.

\(^4\) Depositors are indirectly facing double moral hazard. First, banks usually behave as sleeping partners in their relationship with borrowers. The banks are usually unconcerned about the actions taken by the borrowers in obtaining the highest possible returns; the lenders, in fact, have no control over the actions that are not observable. A more useful review about the determination of the optimal repayment function can be found in Innes (1990). Second, the depositors are also facing moral hazard taken by the bank. Depositors (usually unsophisticated and dispersed) are not capable of observing the actions taken by the banks whilst the banks have their own utility maximization process. These two moral hazard problems might adversely affect the value of banks' assets and, in fact, the real claims value of the depositors.
well as the banking industry has become a technology intensive based industry. Through the application of a minimum disclosure standard, dispersed and sophisticated depositors will have a higher level of protection. As reviewed in some studies, including those of Holmstrom (1979) and Laffont and Tirole (1986), a higher level of information disclosure is able to reduce the moral hazard for two contracting parties\footnote{Holmstrom (1979) has theoretically proven that any additional information exhibited by the principal before the realization of the contract may reduce moral hazard. In Laffont and Tirole (1986), it is shown that additional information regarding hidden action taken by the agent can reduce moral hazard.}

**To ensure systemic stability**

Due to its very important roles, Papadimitriou (1996) states that banking regulation should seek to foster two critical structural objectives. First, ensuring the long-term stability of the financial system. Second, promoting the financing of the capital development of the economy. In conducting intermediary activities, a bank fully relies on public confidence\footnote{According to Llewellyn (1999a), in the absence of financial regulations, the depositors will most probably assume the ‘first come first served’ basis in having their funds repaid. Therefore, once the banking system starts loosing public confidence, withdrawals by some depositors may trigger chain reactions by other depositors (bank runs).}. Once the banking system starts to loose confidence, their intermediary activities cannot be performed. Hence, without adequate systemic regulation, the banking system is very vulnerable to disturbance. Systemic regulation is needed when the social cost of a financial institution failure exceeds the private cost. Systemic hazard is triggered by a deterioration in public confidence that subjects banks to runs while a large proportion of the assets of banks are not easily marketable. In fact, systemic hazard can throw solvent banks into insolvency because panic can drive down the actual market value of their assets. Even in the presence of deposit insurance arrangements, the sum of claims covered by the safety net scheme might not be sufficient to cover losses arising from banks’ speculative activities. Therefore, deposit insurance schemes in some countries do not cover a hundred percent of depositor funds to dissuade banks from investing depositors’ funds in speculative investments and to encourage depositors to select and assess the soundness of the bank.
Systemic danger in the banking system, in fact, is a logical consequence of the application of debt-based liabilities. The real value of the banks' liabilities is determined by the value of the banks' assets, whilst the contractual value of the banks' liabilities is invariant to the real assets' value. The failure of any financial institution, especially in the banking system, may affect adversely the stability of the whole banking system. On the contrary, financial institutions which have equity based liabilities will not create systemic danger in the financial system since the value of the banks' liabilities is not invariant to the real assets' value.

The regulations set by the government have to be capable of maintaining the safety and soundness of financial institutions and should also prevent any adverse behaviour by bankers. The banking regulatory authority and banks' management should have close co-operation to build a robust financial system. Generally, the prudential regulation implemented should cover a range of financial aspects, including liquidity, solvency, risk exposure and the soundness of individual institutions and the whole market. Prudential regulation is needed to deal with imperfect consumer information and agency problems where they exist. In fact, prudential regulation is needed not only by the customers, but also by the institutions that provide the safety net scheme, especially in determining the appropriate levels of premium levied. Llewellyn (1999a) mentions three particular elements for robustness while referring to the ability of the financial system to remain stable and efficient under a wide range of market condition and shocks. First, the financial system should be able to accommodate any change in the system as the market alters (flexible). Second, the financial system should have a capability to overcome any financial turbulence caused by external shocks, including macroeconomic instability (resilient). Third, the financial system should also have internal stability. He also mentions some factors causing instability in financial markets, such as macroeconomic instability, the financial system's poor infrastructure, market indiscipline and the poor quality of regulation and supervision. Different countries with different levels of macroeconomic stability face different levels of systemic risk. Therefore, countries having undeveloped and unstable macroeconomic environments should consider a more
stringent prudential standard for banking operations compared with developed countries.

Information disclosure supported by sound legal arrangements and a sound auditing system in the financial system are also crucial concerns that should receive attention from all the players in the system. Information disclosure should include ex-ante risk assessment and ex-post asset valuation, so that the related parties, especially the depositors, will be fairly informed. It has been evident that financial crises were initiated by inadequate internal risks analysis and control systems (Greuning and Bratanovic, 1999). Moreover, poor financial risk analysis can possibly introduce disincentives to conduct prudent practices within the financial system. Financial institutions, depositors and banks (managers and owners) are all involved in the process of financial intermediation, hence their actions affect the incidence of systemic risk (Stanton, 1995). The regulator, on behalf of depositors, acts to limit excessive risk-taking by banks. Regulations set must be optimal in shaping the responsive behaviour of every agent within the regulatory framework. In the condition where the social cost of systemic risk is very high (e.g. large deposit insurance fund losses), a financial system cannot fully rely on pure market forces.

In implementing regulation, there are some informational problems faced by regulators (Goodhart et.al. (1998)). First, they do not know exactly the quality of a bank’s internal risk management. Second, once they have put regulations in place, they cannot fully observe the compliance of banks with the rules imposed. Finally, there is no perfect model to measure risk precisely. There must be some residual risks. The managers of the banks have to make adequate effort to keep portfolio risks under control. Appropriate regulation allows banks to operate within their risk-taking capacity that accords with its portfolio investments. Since banks have various portfolio investments, the supervisor can solve this problem either by examining its risk management systems or by letting the banks choose their own examination methods. If the incentives are right, the banks will self-select into the appropriate category of the regulation set. On
the contrary, if the incentives are not right, the banks will be forced to adversely select the options (Kupiec and O’Brien (1997))\(^7\). In some extreme cases, the incentives set should be able to limit moral hazard problems that arise when banks are tempted to make risky investments in order to recover any initial losses. In the case of Barings, the downfall of the whole bank in February 1995 was caused by a single trader who decided to ‘gamble for resurrection’ by hiding the losses and by taking on positions more aggressively in order to recover initial losses. The absence of adequate internal control mechanisms also rendered the bank unable to control its risky investments (A complete review about the collapse of the Baring, the chronology and analysis, can be found in Hall, 1995a, 1995b, 1995c, 1996a and 1996b). As a matter of fact, the behaviour of every employee in banks is mostly shaped by incentive schemes set by the institutions. If the management is given a significant reward for risk-taking, they tend to behave more aggressively. Contrariwise, they tend to be risk averse if the schemes discourage risky actions.

There are a number of reasons why banking regulation should be put in place. First, the customers need a degree of comfort and confidence that can be provided by regulation. The customers face a potential adverse selection problem in a situation where they know there are good and bad products, but, because of insufficient credible information, they are unable to distinguish them at the point of purchase. In an imperfect financial market, the costs of intermediation are also high. Second, there is a possibility of the bank being tempted to adopt short-term strategies to maximise return. In this situation, other firms might be driven out of business because they cannot compete (adverse selection). Another possibility is that other firms are induced to behave badly when they either see bad behaviour in others, or have no assurance that the competitors will behave well (moral hazard). Therefore, there is a need for continuous monitoring of the behaviour of financial firms. The existence of deposit insurance arrangements and a

\(^7\) Using the assumption that the management of a bank will always seek to maximize shareholder value, Merton (1977) discusses the option value effect of the bank as the main reason for the 'gamble for resurrection' strategy adopted by banks as the result of the application of flat rate premium deposit insurance arrangements.
CHAPTER 2 FINANCIAL REGULATION

lender of last resort facility might create more intense moral hazard problems for both consumers and financial firms. Third, the failure of an individual bank may have contagious effects on other banks.

According to Llewellyn (1999a), regulatory agencies generally apply two types of regulation: prudential regulation and conduct of business regulation. Prudential regulation is applied to assist the customers when facing asymmetrical information problems where customers are not in a position to judge the safety and soundness of banks. The banks perform fiduciary roles for depositors. After a long-term contract has been taken out, no one can guarantee the post-contract behaviour of the bank. Besides prudential regulation, regulators may also apply conduct of business regulation that focuses upon how financial firms conduct business with their customers. It includes information disclosure, the honesty and integrity of firms and their employees, the level of competence of firms, fair business practices etc. This kind of regulation will induce financial institutions to behave appropriately in dealing with their customers. Considering the amount of money at risk and that the opportunities for principal-agent conflicts of interest are generally high, problems of customer protection within the financial service area are more severe than in other businesses. Several attempts have been made to reduce the probability of principal-agent conflict of interest, like setting standard entry qualifications and standard good behaviour requirements and ethics to avoid moral hazard.

2.3. Banking Regulation

The soundness of banking systems in every country depends on the establishment of appropriate banking regulation. Banking regulations can be viewed as a set of incentives to shape the behaviour of banks’ managers and the specific characteristics of the

---

8 In the money market, a bank interacts with other banks to optimize its portfolio management. In a very liquid money market, the volume of inter-bank transactions may reach a big amount; therefore banks may have intensive connected liabilities. The collapse of a bank may adversely affect other banks in the system.
banking industry. As a matter of fact, the government and the public have the same interest to the establishment of an efficient and sound banking system. The government needs the participation of the public for savings mobilisation, and at the same time, the public needs safe financial services (see exhibit 2.2).

**Exhibit 2.2**
A regulatory framework for the banking system

---

2.3.1. Regulation and governance

As discussed earlier, the banks are faced with new risks and challenges. The globalisation process, the volatility of financial markets and competition among financial institutions has forced the banks to be market oriented in order to remain competitive. The regulators and supervisors also have to change their approaches to regulation and supervision; however, they have to realise that they are not the only parties involved in maintaining banking soundness. As the complexity of banking activities increases from day to day, the risk management process has become very important. There are several key players who should be involved in the risk management process in ensuring the safety and stability of both individual banks and the banking system as a whole (see Exhibit 2.3). All the players in the financial system
should have the right incentives to motivate them in supporting good governance in the banking system. Financial regulations can be viewed as a tool that involves creating incentive-compatible constraints, directing prudent financial operations and shaping responsible behaviour of the players.

Exhibit 2.3
Key players supporting good governance in a banking system

<table>
<thead>
<tr>
<th>Regulatory environment that supports the enhancement of every party’s role in the banking system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal auditors</td>
</tr>
<tr>
<td>Day-to-day control on the policy implementation process</td>
</tr>
<tr>
<td>Board of directors</td>
</tr>
<tr>
<td>Voice, increasing shareholders’ value</td>
</tr>
<tr>
<td>Shareholders</td>
</tr>
<tr>
<td>Increasing shareholders’ value</td>
</tr>
<tr>
<td>Replacement</td>
</tr>
<tr>
<td>Policy implementation</td>
</tr>
<tr>
<td>Voice, replacement &amp; exit</td>
</tr>
<tr>
<td>Public, including financial analysts, rating agencies and stock brokers</td>
</tr>
<tr>
<td>Executive management</td>
</tr>
<tr>
<td>Independent opinion on the fairness of bank’s financial statements</td>
</tr>
<tr>
<td>External auditors</td>
</tr>
</tbody>
</table>

The roles of the regulatory and supervisory authorities
As mentioned earlier, the banks face a broad spectrum of risks in their operations. The traditional prescriptive regulatory approach seems to be incapable of coping with modern banking operations because of its limited scope. On the other hand, the regulatory and supervisory authorities have to realise that they cannot solely prevent bank failures. The main role of the regulatory and supervisory authorities is to facilitate the risk management process and to monitor its compliance with the statutory

---

9 Every economic individual will always maximize his utility (monetary) subject to some constraints, including regulatory constraints. Those regulation constraints should be able to harmonize the different
framework in which the risk management process is undertaken. Llewellyn (1999b) states that there should be incentives for the regulatory and supervisory authorities that ensure the regulators/supervisors supervise the banks’ risk analysis and ensure that the banks’ risks do not move outside the range which can effectively be covered by banks’ internal insurance funds. According to Greuning and Bratanovic (1999), a more appropriate mission for the regulatory and supervisory authorities today would be:

‘To create a regulatory and legal environment in which the quality and effectiveness of bank risk management can be optimised in order to contribute to a sound and reliable banking system’

A market oriented regulatory approach emphasises risk assessment and risk management without unnecessarily applying detailed rules and recommendations on the banks. Moreover, the regulatory and supervisory authorities should be capable of influencing the other key players in the banking system to establish a free market attitude towards bank supervision and professional supervisory functions, as well as to facilitate public understanding of the bank management’s responsibility in the risk management process. In order to achieve an optimal result, the regulator should also maintain its consistency in regulating the system by sending consistent signals to the market. These arguments show the pivotal position of the regulatory and supervisory authorities; hence, they play important roles as the main initiators to optimise and monitor risk management within the banking system.

The role of shareholders
Shareholders play a very important role in shaping good governance in bank operations since they have a right to appoint the board of directors. The board of directors, in turn, determines the direction of a bank. Entry regulation may be the first checkpoint in establishing a sound and prudential banking system. If the regulator succeeds in the screening process, a half way shaping of responsible behaviour by the banking system objectives of the players in the system.
has been achieved since entry regulations are also aimed at preventing 'bad' players from entering the banking system. Besides behavioural aspects, entry regulation is also important for determining a favourable/optimal level of competition in the banking industry. In some countries, major shareholders of a bank must fulfil 'fit and proper' requirements requested by the banking authority as an entry barrier to the banking system. According to Kendal et. al. (1998), there are at least four benefits gained from the implementation of good governance at the corporate level, such as: competitive advantage in the market place, improving efficiency and effectiveness, increasing shareholder value and, subsequently, increasing market value. A similar opinion is voiced by Llewellyn and Holmes (1997).

Generally, the shareholders have three options to control the company, i.e. making their voices heard, management replacement and exit. Making their voices heard is the way to approach management directly and to inform them about their opinions on the appropriate way to run the business. The shareholders can also replace the management committee if they think that the management is not able to fulfil their requirements. If the shareholders, especially the major shareholders, do not agree with the way the company is run, they can simply sell the company's shares on the stock market. The selling of the shares will initiate a share price fall in the stock market and acts as a signal to managers to improve their performance. A modern market oriented approach to bank regulation emphasises the fiduciary responsibility of shareholders, which has increased significantly. Shareholders will suffer monetary loss if the bank neglects general guidance for prudent banking operations; therefore, the shareholders have to be assured of the appointment of proper persons for good governance in the bank. The shareholders should suffer from any costs resulting from any restructuring process taken by the supervisory authority before levying those costs on the government and ultimately the taxpayers. In the United States banking system, the shareholders are very diffused since almost all companies have been listed on the capital market. The most preferable option for the shareholders to express their disagreement in such a system is exit. To overcome the lack capability of controlling diffused shareholders, the US
banking authority applies ‘prompt corrective action’ to immediately discipline any banking institution that neglects its fiduciary roles and prevent unnecessary damage public confidence in the banking system (Fries et al., 1997).

The role of the board of directors
Ultimate responsibility for the success of banking operations is typically placed with the board of directors. It has been evident that 60% of failed banks in US had board members who were incapable of dealing with the banking affairs (Greuning and Bratanovic, 1999). The boards of directors can be viewed as contracting parties who will carry out the business on behalf of shareholders and will increase shareholder value in the future. Therefore, the board of directors should have a sound understanding of the nature of the bank’s business activities and associated risks. The shareholders (through votes) hold control rights in the internal management of the bank. Through the implementation of the right incentives, the management of the bank is expected to always increase the value of shareholder claims. On the contrary, if the incentive schemes do not effectively drive the management to perform well, poor management performance might result in decreasing shareholder value. At the policy level, the board of directors should clearly define the direction of the bank, monitor and assess the risk-based policy, and assure that the implementation of the policy is working effectively. Although the daily activities of the bank are delegated to the officers and employees, the ultimate responsibility for survivability lies fully with the board of directors.

The role of executive management
It is worth noting that not all banks in a depressed environment fail; in fact, the banks with weak management are the ones that give up when times become difficult. The survivability of a bank depends also on the quality, experience and integrity of the individuals in the management team. The management of the bank receives monetary incentives as well as non-monetary incentives (such as esteem) in order to motivate higher achievement.
Llewellyn (1999b) mentions the importance of the implementation of the right incentives in shaping prudent behaviour by the banks’ management. The management should loose if the bank fails due to a lack of professionalism in managing banking businesses. Consequently, the managerial incentive scheme should put strong emphasis on effective risk analysis, management and control systems (ex-ante risk assessment and ex-post asset valuation). This issue also emphasises the need for the control units be fully equipped with effective risk assessment tools and auditing and accounting standard. The presence of internal audit procedures, internal audit committees and effective supervision (by banking supervisor) can build up effective internal control mechanisms. As reviewed earlier, effective banking supervision may create a higher level of risk-aversion, since the bank and the management are under the threat of loosing their future cash inflows.

Poor performance by the banks’ management will finally trigger outside intervention because of high gearing levels and their fiduciary role. The regulators usually determine a minimum solvency ratio (i.e. a minimum capital adequacy ratio) as a trigger point for intervention that may result in transferring management control from shareholders to creditors. Garber and Weisbrod (1992) mention the importance of implementation of ‘cease and desist’ powers in order to prevent asset deterioration that might impact on systemic stability. Dewatripont and Tirole (1999) also discuss about the ‘optimal stopping time’ for intervention in the case of poor management performance.

Management performance of a bank is normally assessed through asset performance. In fact, not all assets can be assessed accurately. Bank assets are generally classified into verifiable assets and unverifiable assets. Verifiable assets consist of short-term debt-based assets that can be accurately assessed. Unverifiable assets consist of long-term assets that can only be assessed through the assessment of market signals.

---

10 The application of the fixed and variable salary mix has been a common practice in the finance industry. The higher the performance of the managers, the higher the total salary will be.

11 In their model, Dewatripont and Tirole (1999) assume that the manager only cares about his private benefit. If the controlling party chooses ‘being passive’, the manager will receive benefit. On the contrary, if the controlling party chooses to ‘interfere’, the manager receives nothing. The optimal incentive
The regulators, acting on behalf of depositors, are in a position to evaluate management performance and to decide the next action to take. Often, regulators need to make a decision before the realisation of unverifiable assets. There are two possible actions to be taken by regulators i.e. stopping/intervening or continuing/passive. This approach basically combines the traditional concept of supervision and sophisticated asset valuation techniques. Modern banking supervision, as a matter of fact, has implemented this approach by adopting various sophisticated risk assessment techniques (such as Value at Risk for assessing market risk, and credit risk metrics for assessing credit risk) as fundamental in determining capital adequacy requirements. If the result of the risk assessment process (through the assessment of market signals) says a bank has a high level of market risk, the shareholders should increase the capitalisation level in order to maintain its solvency sound; otherwise, the insolvency of the bank may result in interference from the outside.

The management team needs also to be supported by adequate systems to monitor and control the bank’s material risks. Bank supervisors also typically include management quality in components of bank early warning systems to determine the soundness of a bank’s operations.

The role of auditors (internal and external)

Internal as well as external auditors can be regarded as an extension of the board’s risk management function. The auditors, on a regular basis, report the level of compliance of the technical implementation with the policy set as a form of feedback to the board of directors (see exhibit 2.4).

---

scheme in the general case is obtained by minimising the ex-post inefficiency while preserving managerial incentives.

12 Traditional banking operations involve mainly saving and lending activities. The assessment of the asset is normally conducted through a creditworthiness assessment process. Recent banking operations involve more sophisticated operations, like trading activities, which need more sophisticated techniques.
Exhibit 2.4  
Feedback by auditors

Internal auditors

Internal audit is a valuable tool for the board of directors to identify and handle risks. It provides independent appraisal on the effectiveness of policy implementation, and compliance with laws, policies and operating instructions.

External auditors

The main task of external auditors is to give an opinion on whether or not the bank’s financial statements fairly reflect its financial condition, and to state the results of the bank’s operations for a given period. Apart from its externality, external auditors have to be considered as an integral part of the risk management partnership since they have a specific role to fulfil in the risk management process. Greuning and Bratanovic (1999) examine the responsibilities of external auditors. These include reviewing management’s adherence to board policies and procedures, reviewing the information supplied to the board, shareholders and regulators, reviewing adherence to statutory requirements and reporting to the board, shareholders and regulators on the fair presentation of information submitted to them.

The role of Customers/the general public

The customers are the parties who will ultimately be concerned about the safety of their investments. The customers are simply investors acting as principals who invest their funds with the financial intermediaries acting as agents. If the customers (public) can clearly understand about the risk that investment entails (through an adequate

---

for asset valuation. The assessment of unverifiable assets (such as the assets assessment for trading activities) is conducted through assessing market signals.
information disclosure process), they will always require the financial intermediaries to conduct prudent behaviour in order to assure financial safety. The financial intermediaries, in turn, are given less chance to abuse their fiduciary roles. Recent definition of the public has become broader to include the financial media and analysts, such as stockbrokers, other advisers and rating agencies.

2.3.2. International convergence of banking regulation

Due to the globalisation process in the financial system, it seems to be unavoidable for the banks to expand their operational exposures internationally. However, the banks operate business across countries with different standards of regulations. Besides the benefits that can be gained from the globalisation process, a wider systemic problem may also occur as a result of the contagion effect of bank failures in a particular region; therefore, global financial stability depends on regional financial stability. Financial turbulence in one region can spread rapidly to other parts of the global financial system (Basle Committee, 2000c). As a matter of fact, the needs for international regulatory convergence have been recognised since the mid-seventies. The Basle Committee was set up in the crisis atmosphere of the 1974 bank failures, including the Herstatt Bank in Germany, The Franklin National Bank of New York and the British-Israel Bank of London. The committee was established by the group of ten countries as the Committee on Banking Regulations and Supervisory Practices, at the end of 1974. It focused its early attention on the prudential supervision of the internationally operating banks. According to Kapstein (1991), the main purpose of the committee is to close gaps in the supervisory net and to improve supervisory understanding and the quality of global banking supervision. The committee recognised that the supervisory responsibilities of host and parent authorities were both complementary and overlapping. The committee tried to achieve the main purposes in three principal ways: by exchanging information on national supervisory arrangements; by improving the effectiveness of techniques for supervising international banking business; and by setting minimum supervisory standards in areas where they are considered desirable.
The first Basle concordat was introduced in 1975 with the establishment of five principles that emphasise the importance of international standards of supervision\(^\text{13}\). The host and parent authorities should co-operate in promoting the soundness of the internationally operating banks. In 1981, the Basle committee developed the concept of ‘consolidated supervision as a means of giving practical effect to the principle of parental responsibility’ to remedy the complementary and overlapping problem. In 1983, the revised-version of the original concordat was finalised in a document, entitled ‘Principles for the Supervision of Banks’ Foreign Establishments’. The document covers two basic principles: that no foreign banking establishment should escape supervision; and that supervision should be adequate. The guidelines for the consolidated supervision of international banks have been revised several times and the principles of the concordat were reformulated as minimum standards in 1992 after the enforced closure of BCCI (see Hall, 1993a and 1993b).

The Committee released a consultative paper about the core principles for effective banking supervision that comprise twenty-five basic principles (Basle Committee, 1997). Those principles include preconditions for effective banking supervision, licensing and structure, prudential regulation and requirements, methods of ongoing banking supervision, information requirements, formal powers of supervisors and cross-border banking. The Basle Committee believes that achieving consistency with the core principles by every country will be a significant step in the process of improving financial stability domestically and internationally. Until recently, the principles agreed by the Basle Committee have been widely disseminated by many countries. The agreed principles are designed to increase the level of supervisors’ consciousness of their mutual interdependence where the international active banks within their jurisdictions are concerned. As the 1988 Accord (Basle Committee, 1988) has been a corner stone of the current financial structure, it has helped to strengthen the soundness and stability of

\(^{13}\) The five principles include joint responsibility for adequate supervision, liquidity, solvency and practical co-operation that would facilitate transfer of information between host and parent authorities.
the international banking system and enhanced competitive equality among internationally-active banks.

2.3.2.1. Supervisory review and market discipline

The supervisory review process
The supervisory review process, in fact, is a continuous process that minimises the difference between the actual financial conditions and the preferred financial condition (regulatory standards). The supervisory standard was, firstly, released in 1997 (Basle Committee, 1997a). Supervisors should always ensure that the bank management develops an internal capital assessment process, setting capital targets that are commensurate with the bank's risk profile and control environment. The supervisors should seek to intervene at an early stage to prevent the capital of the bank from falling below the minimum required level through an evaluation of the banks' internal capital adequacy assessment and strategies, and their ability to monitor and ensure their compliance with regulatory capital ratios. (see Basle Committee 1999g, 2000b and 2001f). It has been evident that poor performance of supervisory function led to some financial crises (Basle Committee, 1999d).

Market discipline
Transparency is very important in the banking supervision process. Banking supervisory and regulatory authorities have used information disclosure to increase systemic stability in the banking systems. Adequate information disclosure would enable market participants to comprehensively evaluate banks' financial risks, especially in the increasingly volatile financial markets. Any negative information or misleading information to a public may possibly damage a bank and even cause systemic instability in the banking system. A proper disclosure process may moderate the responses of market participants to bad news by helping market participants assess negative information and mitigate panic; hence, improved transparency through better disclosure may reduce the chance of systemic banking crises. The information disclosed usually
involves qualitative and quantitative information in annual financial reports, supplemented by biannual or quarterly financial statements and other important information. Through the high quality of information provided, banks will be able to always improve their reputation. Information disclosure involves not only providing the financial information, but also reporting the decision-making process through a timely reporting system. Information disclosure, as a matter of fact, would improve accountability in conducting fiduciary roles. Market participants, including banking supervisory and regulatory authorities, have wider opportunities to justify actions taken by the banks and accept responsibility for both decisions and results. Information disclosure would improve the predictability and subsequently the efficiency of policy decisions. Moreover, it would improve internal discipline and better governance (Basle Committee 1998d). According to Greuning and Bratanovic (1999), transparency and accountability are mutually reinforcing. Transparency emphasises a proper monitoring process that will enhance accountability. Contrariwise, accountability that is represented in a reporting process will give an incentive to other market participants ensuring that their actions are properly disclosed and understood.

One important aspect in the information disclosure process is a realistic asset valuation process, including sensitivities to future events and adverse developments. This issue addresses the importance of the evaluation of a bank's entire risk profile, including future solvency risks since all regulatory requirements are normally prepared under the assumption that the banks will continue to operate as a going concern. Insufficient information provided will potentially mislead other key players in the banking system and, more importantly, banks may not be aware of the true financial conditions. Through the ongoing process, the banking supervisory and regulatory authorities will always minimise risks in the banking system. The banking supervisory and regulatory authorities, as a matter of fact, should be fully equipped by skilled staff and have

14 The supervisory process is usually conducted via the following particular actions: issuance and withdrawal of banking licenses; issuance and enforcement of prudential regulations and standards; prescribing covenant reports such as establishing off-site and on-site inspections; assessing penalties and initiating emergency actions; and, liquidations.
adequate financial backup and technology so that they will be able to always deal with recent developments in the financial system. The financial risks faced by the banks will be different from time to time. Bank supervisors cannot guarantee (nor should they) that banks will not fail, the potential for banking failure is an inherent part of risk-taking process. The main objective of the supervisory and regulatory process is to maintain stability and confidence in the banking system that could facilitate the exit of problem banks without causing contagion effect to other banks i.e. minimising disruption to the system. The supervisors as well as the banks should be able to recognise, monitor and control risks inherent in the banking operations. To address this issue and through the prudential guidelines, most banking regulators regulate some financial risks resulting from a particular type of banking risk exposure. Sophisticated statistical models have even been implemented widely by banking supervisors to fairly assess asset quality in a dynamic approach (Value at Risk (VaR)). Ultimately, effective financial risk management, close monitoring of risk exposures, and compliance with prudential guidelines set by effective banking regulations are essential ingredients in forming an effective banking supervision process. The standards for minimum market discipline has, recently, been formalised in the third pillar of the New Capital Accord (Basle Committee, 2001g).

2.3.2.2. Risk-based capital regulation

A. The role of bank capital
One of the important issues included in the core principles for effective banking supervision is the capital adequacy framework. However, during the considerable economic turbulence, the Accord’s capital ratio, sometimes, does not represent the bank’s actual financial condition. The Committee has always been trying to design a new framework to better align regulatory capital requirement to underlying risks, and to recognise the improvements in risk measurement and control (Basle Committee 1999a and 2001a). Introducing the proposal of the new capital accord, McDonough, Chairman of the Basle Committee, notes:
'This new capital framework consists of three pillars: minimum capital adequacy, which seek to develop and expand on the standardised rules set forth in the 1998 accord; supervisory review of an institution's capital adequacy and internal assessment process; and effective use of market discipline as a lever to strengthen disclosure and encourage safe and sound banking practices. The Committee that, taken together, these three elements are the essential pillars of an effective capital framework.'

Capital has been a source of great concern since the large increase in the number of bank failures during the mid-1980s and in the 1990s. Wesson (1985) states the capital role is related to capital resources and the maturity structure of assets and liabilities. Viability depends not only on depositors being confident that the maturity transformation in bank balance sheets is not excessive in relation to capital resources but also that this confidence extends to all risk exposures which exist in banking assets. Risk-based capital formulas have been used in the past by rating agencies and by insurers themselves for internal management purposes and now, under the Basle capital accord, risk-based capital provides a uniform regulatory standard for the banking industry (Weinberger, 1992). Most regulators want banks to hold higher capital levels to give more protection to depositors of individual banks and reduce potential systemic risk in the banking industry. Since the banking industry plays a very important role in fostering economic activity, a crisis in this industry will potentially affect adversely every economic sector. Regulators do not have many options besides making efforts to shape a sound banking system by imposing an appropriate set of prudential regulations, including demands that the level of capital is capable of absorbing losses without reducing efficiency and competitiveness.

Levitt states that there are four salient functions of bank capital\(^\text{15}\). First, capital protects uninsured depositors in the event of insolvency and liquidation. Second, it absorbs

\(^{15}\) Reported by Alex J. Pollock in: Gradual changes become fundamental changes: The evolution of the American banking system in Global Risk-based Capital Regulation: Management and Funding Strategies, edited by Charles A. Stone and Anne Zissu. IRWIN.
unanticipated losses with enough margin to enable the bank to continue as a viable
entity. Third, it allows for infrastructure development and service expansion. Fourth, it
functions as a regulatory constraint on unjustified asset expansion.

According to Llewellyn (1997b), the role of capital covers internal as well as external
factors. First, the capital absorbs operating losses (risks and shocks). The banking
industry is not quite the same as any other industry. Most of its assets are financed by
very short-term liabilities. The bank has to keep to its promise to repay all of its
liabilities at the due dates. Hence, the bank has to keep its net-worth position sound by
holding a level of capital that is sufficient to absorb possible losses generated by market
shocks or by any market distortions (especially its availability to cover risks within the
business that cannot be insured in the external insurance market). Nevertheless, holding
an adequate level of capital in this sense does not guarantee that the bank will not fail.
The bank still needs good management to assure internal governance works well.
Second, bank capital maintains the confidence of depositors. A well-capitalised bank
gives a signal to depositors that the bank has a capability to repay all its liabilities when
they are called. Even in the absence of deposit insurance arrangements, the depositors
will have confidence to put their money in the bank if the bank is adequately capitalised.
Depositors have to be assured that there is a group of specialist risk-takers prepared to
underwrite the risk inherent in the nature of banking business. Third, bank capital can
support long-term funding (supporting infrastructure). Ideally, capital has unlimited
maturity. It is usually used to finance fixed assets, like the infrastructure of the bank
(such as buildings and office equipment) and service expansion. Finally, bank capital
may prevent deterioration in asset quality. An adequate level of capital is able to
potentially reduce the danger that a bank becomes a captive of its bad debtors.
Naturally, the capital holders will act to prevent losses generated by excessive risk-
taking because they are also exposed to possible losses. Subsequently, an adequate level
of capital is capable of alleviating the danger that potentially good future loans are
crowded out by bad loans.
Dewatripont and Tirole (1999) discuss how the insolvency condition is used as a trigger point for transferring management control from equity holders to debt holders when the bank's performance is not satisfactory. Depositors and shareholders, basically, have different attitudes towards risks for several reasons. If a bank is adequately capitalised, the shareholders enjoy any monetary surplus from any increase (solvent region) or suffer from any decrease in the bank's asset value. For this reason, shareholders have a control right over the bank management. But, if a bank is undercapitalised (insolvent region), the shareholders will make money if, in the future, the income is high enough to cover the insolvency and to give them additional monetary surplus. This condition will induce them to gamble since the shareholders, in this position, have nothing to lose. On the contrary, depositors become almost like shareholders when the bank is undercapitalised since the value of the liabilities is not buffered by the equity. Fluctuation in asset value will directly determine the value of liabilities; hence, the depositors are directly facing the risks. In the presence of deposit insurance arrangements, the governments/banking regulators are, in fact, the ultimate guarantors for any insolvency events; therefore, it is a logical consequence that the regulators should be in a position to control the banks' management. In order to assess fairly the net asset value of the bank, the bank supervisors should be adequately equipped with appropriate tools for asset valuation and risk assessment.

The idea of risk based capital is illustrated in Exhibit 2.5. As illustrated below, the present value (PV) of the future return of a bank is assumed normally distributed \( N(\mu, \sigma) \). However, every bank will have its own distribution, with a different mean and variance, depending on its own portfolio. Under the normality assumption, we can calculate the loss expectation of the bank by multiplying the probability of a negative return by the total value of the portfolio. In the illustration below the probability of a negative return is represented by the area under the normal distribution curve between \(-\infty\) and 0 (x percent).
The regulators have their own reference cut-off number that is considered sufficient to maintain banks’ solvency in daily operations. If a bank has excessive risky assets (in this case, the probability of a negative return exceeds the number required by the regulator) the owner should provide a greater amount of capital in order to maintain the expected loss within the limit (Weinberger, 1995). One of the advantages of risk based capital requirements is correcting the disincentive to hold capital. Risk-based capital requirements are implemented in order to force risky banks to hold more capital without forcing safe banks to hold excessive capital. There have been several attempts to measure the precise amount of risk relating to the quality of assets. The riskier the asset, the more capital has to be allocated by the owner.

**Shareholder value and capital adequacy in a dynamic analysis**

As reviewed earlier, banks’ shareholders play a very important role in conducting good governance in banking operations; hence they have to have the right incentives so that they will be encouraged to be positively involved in monitoring activities. The shareholders are basically concerned with their monetary incentives (net worth value and future/expected monetary surplus). As a matter of fact, there have been several concepts explaining shareholder value. A traditional approach towards the cost of
capital and optimal capital structure assumes that the objective of the firm is to maximise the market value of the firm and there exists a perfect capital market. The total market value of the firm is the sum of the market value of debt and the market value of equity. In the traditional approach, it is assumed that the value of the firm is maximised when the weighted-average-cost of capital (WACC) is minimised. This value maximisation produces a U-shape for the WACC; hence, the optimal capital structure corresponds to the minimum cost of capital. Modigliani and Miller (1958) deliver a different view towards an optimal capital structure. They argue that, assuming a perfect capital market and no taxes, both the value of the firm and the capital cost are constant since they are independent of the firm's capital structure. However, Modigliani and Miller's theory assumed that all firms have similar risk, which is not practically accepted. When firms have limited liability, shareholders would prefer the firm to be more highly geared since they do not have to bear the negative cash flows in those states where the firms goes bankrupt (Eichberger and Harper, 1997). Similar opinions have also stated in Shrieves and Dahl (1992), Park (1997), Calera and Rob (1999), Blum (1999) and Basle Committee (1999e).

Milne and Whalley (1999, 2001) address the basic analysis of moral hazard within a dynamic setting in which there are constraints on the issue of equity capital and a random regulatory audit. Bank capital is considered as a form of self-insurance against

\[ dA_{NAV} = (RA - d)dt + \sigma dz \]

where \((RA-d)\) is a drift parameter, \(\sigma\) is a variance parameter and the bank pays dividend at rate \(d\). It is assumed that \(d \geq 0\). If, in the audit that is held randomly, it is found that the net asset value of the bank falls to a negative value, the bank might face a take-over or even liquidation by the regulator/ supervisor. In the liquidation, the savings account and current account holders are paid in full \((D)\), the remaining asset value \((A-D)\) is paid to investment deposit holders while shareholders get nothing. Let us assume that the audit process directly applies a Poisson specification with parameter \(q\), indicating that in each period \(\delta t\), there is a probability of \(q\delta t\) of an audit being carried out as modelled in Merton (1978). The bank must balance two conflicting objectives: (i) keeping sufficient resources inside the firm to reduce the probability of future liquidation, (ii) paying out resources to satisfy shareholders. The firm is also facing
poor asset returns. Critically-under-capitalised banks under immediate threat of closure are concerned only with survival, leading to a short-sighted risk-loving behaviour. In contrast, a moderately-under-capitalised bank performs risk-averse behaviour to protect future profit (charter value). Campbell, Chan and Marino (1992) formalise the notion of substitutability between capital requirements and monitoring in controlling the behaviour of bank managers. In the condition where the monitoring of banks’ assets is not efficient, the regulator may use capital requirements to prevent excessive risk-taking by the banks. At a high level of capital, the shareholders face the threat of loosing higher monetary benefits, therefore they will be more risk averse. In a condition where asymmetric information is less likely between banks and the regulator, monitoring activities are feasible. The regulator in that condition may apply less stringent capital requirements since the regulator is able to observe a more ‘real-time’ condition of asset quality of the banks. In different regulatory regimes, the regulator might even place some part of regulatory monitoring responsibility on the bank.

The basic assumption of the analysis is that shareholder value (as an option value) can always be increased by a widening of the distribution of returns. Hence, if the variance can be increased without reducing expected returns, the bank increases this variance to the maximum degree possible. If a bank always maintains its profitability and solvency, its future earnings (charter value), represented by positive present discounted value, act as a self-insurance. If the charter value is significant, the shareholder will have incentives to avoid asset deterioration that may result in liquidation. Marcus (1984) states that charter value is capable of restraining moral hazard in banking. Keely (1990) states that new entry and other erosions of charter value are reasonable explanations of the increased level of bank failures in the United States during the 1980s.

an exogenously imposed liquidation trigger. The value of the bank to shareholders satisfies the ordinary differential equations:

\[
(p + q)V = \max_{d, \sigma \in [\sigma_1, \sigma_2]} \left[ d + (RA - d)V_N + \frac{1}{2}\sigma^2V_{NN} \right], \quad A_{NAV} < \bar{A}_{NAV}
\]

\[
\rho V = \max_{d, \sigma \in [\sigma_1, \sigma_2]} \left[ d + (RA - d)V_N + \frac{1}{2}\sigma^3V_{NN} \right], \quad A_{NAV} > \bar{A}_{NAV}
\]
Apart from a desire to preserve the charter value of the bank, effective monitoring by banking supervisors will affect the attitudes of shareholders toward risks. From the simulation shown below, it can be seen that the higher the probability the supervisor will detect the asset deterioration, the lower the asset value expected by shareholders (see Exhibit 2.6). The dotted line refers to the case where there is a higher probability of the regulator detecting undercapitalised banks and promoting the take-over or liquidation process.

**Exhibit 2.6**
The value of the firm

Intuitively, the higher the probability of the regulator detecting undercapitalised banks, the lower the incentive for excessive risk taking. If the bank is well capitalised, shareholders are more risk neutral since there is only a small probability of liquidation. Therefore, the shareholders seek to self-insure against the possibility of liquidation triggered by asset deterioration since they do not want to loose the expected future cash in-flows. In Milne and Whalley’s work, the mean-variance trade-off is determined by

\[-V_{xx}/V_x^{17}\]

17 Milne and Whalley (1999) assume that the portfolio decision impacts both on expected return and on the variance of returns where $V_{xx}$ and $V_x$ are the second derivative and first derivatives of the value of the firm respectively.
Exhibit 2.7 shows different levels of risk aversion as a result of different probabilities of liquidation. The dotted line implies higher probabilities of liquidation that result in a higher level of risk aversion. This analysis addresses some important issues in shaping proper risk taking behaviour. Besides prescribing an adequate level of capitalisation, the regulator has to be capable of detecting undercapitalised banks at an early stage.

Exhibit 2.7
Absolute risk aversion

The regulators (government) set up safety net schemes (deposit insurance) to maintain systemic stability. However, the implementation of deposit insurance may create moral hazard since the systemic cost will fall, ultimately, on the tax-payers. Often, the bank supervisors and regulators are in a difficult position to make a decision whether to close the ailing banks early or to be more ‘patient’ in order to give chances to the banks to improve their financial positions\(^\text{18}\). In the early closing approach, bank supervisor may require a bank to reorganise itself or even to liquidate a bank while it still has a positive net asset value. This, intuitively, will create incentives for the banks’ shareholders to inject more capital to prevent the loss of future cash-inflow; therefore, the willingness of

\(^{18}\) Fries et.al. (1997) report a different approaches taken by the US banking supervisory authority that apply ‘a prompt corrective action’ and the Japanese bank regulator that has opted for a more patient approach towards banks weakened by the collapse of the asset price bubble, allowing them the chance to earn their way out of difficulty.
the shareholders to inject more capital to avoid insolvency constrains banking policy. On the contrary, in the late closing approach, shareholders may be reluctant to inject more capital to the bank since there is not a threat of prompt liquidation in the case of insolvency (the shareholders can still expect future cash-inflow). In the late closing approach, the regulatory authority is always prepared to subsidise the banking system and even to face a huge systemic bankruptcy cost. In order to reduce moral hazard, it is suggested that the banking supervisory authority should introduce risk-sensitive deposit insurance premium. Fries et.al. (1997) study a series of different possible closure rules and subsidy policies that bank regulators may apply. The actuarially fair premium rate has to make shareholders feel indifferent between applying the deposit insurance scheme in the banking operation and holding unlimited liability claim to the bank’s net cash flow with a zero premium rate. The banking regulator, acting as social planner, should minimise the discounted, expected lump-sum bankruptcy and monitoring costs, ignoring the additional cost to the insurance corporation of taking on the bank’s portfolio of deposits and loans.

B. Risk spectrum of banking operations

As an intermediary institution, risk management is a major activity of the bank. Any financial institution, including a bank, has to control and select the risks inherent in the management of deposits, loan portfolio and off balance sheet contracts. Risk itself can be defined as the uncertainty of outcomes of the business. The idea of not putting all the eggs in one basket is the earliest basic understanding of portfolio risk analysis and diversification. This idea was firstly formalised and applied to financial instruments by Markowitz (1959). There are a number of classification systems used by economists

19 The model explores the potential response by a bank’s shareholders in anticipating banking policy implemented by the banking regulators. The higher the subsidy given by the regulator, the higher the option value experienced by the shareholder (the late closing approach). Contrariwise, the more stringent the closing procedure that has been applied, the lower the option value experienced by the shareholders. The basic assumption for the models is the same as the assumption for the shareholder value model by Milne and Whalley (1999). The expected cash-inflow for the shareholder is assumed to follow geometric Brownian motion as the expression of the stochastic process in determining the shareholder value from time to time.

20 Based on the assumption that each portfolio construction can be structured as a function of expected mean and standard deviation of the portfolio return, he concludes some basic ideas. First, portfolio risk
relating to the activities engaged in by banks. An early definition of risk is given by Mullin (1977) who classified risk into management and operations risks. The definition and classification evolved as the complexity of bank operations increased from day to day. Gardener (1986) states that banks face general risk, international risk and solvency risk. General risk is also known as fundamental risk, comprising liquidity risk, interest-rate risk and credit risk. More generally, Jorion (1997) states that banks are exposed to three types of risks i.e. business, strategic and financial risks. Business risk is associated with corporate competitiveness and value added for shareholders. This includes product innovation, product design, and marketing that improves the possibility of meeting customer needs among similar products or other substitute products. Strategic risk results from the shifting economic or political environment. As a matter of fact, the fundamental economy of a country depends on other factors, like the political environment and radical technological inventions. Since external factors, like the political environment and technological inventions, are not easily predicted, it is very difficult to hedge this kind of risk. The only way to limit strategic risk is to diversify the business. Financial risks relate to possible losses in financial markets.

The possibility of experiencing losses arises because of movements in financial market variables, such as interest rates and exchange rates. If financial managers understand about financial risks, then exposure can be controlled. Risk management is needed to identify, measure and control various risk exposures, therefore it has become an essential tool for the survival of businesses. Generally, financial risks are classified into market risks, credit risks, liquidity risk, operational risk and legal risk. Greuning and Bratanovic (1999) describe the risk exposures of a bank that can be classified generally into four categories i.e. financial risks, operational risks, business risks and event risks, as illustrated in Exhibit 2.8.

will typically be less than the weighted-average of the individual assets’ risks. Second, the lower the correlation between asset returns, the lower the portfolio risk. Third, assets risks can be divided into diversifiable risks (risk that can be eliminated/reduced through a judicious combination of this asset with other assets) and undiversifiable risks (risk that cannot be eliminated/reduced through a judicious combination of this asset with other assets).
Exhibit 2.8
Banking risk spectrum

Market risk

Along with the rapid development of the financial system, trading activities have become dominant in banking operations. International trading activities have become more intense and various financial instruments have enhanced financial market efficiency. The intention by the Committee has been formalised in various papers (Basle Committee 1993, 1995 and 1997b). Those phenomena have attracted banks to involve in such activities and require the banks to pay more attention to the market mechanism. By definition, market risk is the risk of losses in on and off-balance sheet positions arising from movements in market variables, such as interest rates, equity prices, exchange rates and commodity prices. Market risk is not only reflected in the trading book position, which is intentionally held for short-term resale, but also in banks’ total trading and non-trading positions. Market risk can be measured in terms of currencies (absolute risk) or by comparing the loss potential to the benchmarks that are usually denoted by financial indexes (relative risk).
Until recently, various techniques have been developed in order to obtain more realistic models that are able to represent market behaviour more precisely. To have an easy-to-understand method for calculating and controlling market risk, they are turning to Value at Risk (VaR). The main purpose of a VaR system is to quantify market risk in a way that enables management to take prompt remedial action in case of losses or unusual exposures. Kupiec and O'Brien (1997), as called for by the Basle Committee (1996) break down market risk into two components: general market risk and specific market risk. General market risk relates the fluctuations in asset value to broad-based movements in securities prices and to changes in exchanges rates and commodity prices. Specific market risk relates the fluctuation in asset value to idiosyncratic developments. So far, development in market risk assessments has been impressive. Banks have implemented various sophisticated techniques to assess their exposures more precisely. Through the application of advanced statistical (econometrics) techniques, such as ARCH/GARCH, the volatility (variance) of the market can be predicted more precisely21.

Market value at risk modelling allows us to predict expected return gained from various investments in financial markets. The maximum expected loss (or worst loss) over a target horizon is calculated within a given confidence interval. For example, the Basle Committee requires banks to observe a 99 percent confidence interval \((1-\alpha)\) over 10 days that presumably reflects the trade-off between the desire of regulators to ensure a safe and sound financial system and the adverse effect of capital requirements on bank returns22 (Basle Committee, 1996). Value-at-risk valuations depend on the predictability of the volatility of market variables, like interest and exchange rates. An increase in

---

21 The (General) Auto-regressive Conditional Heteroscedastic ((G)ARCH) model is a time-series econometric model that is generally used to model the pattern of the volatility of market variables (i.e. exchange rates, interest rates, commodity prices etc.) in a particular time period. For example, the general form of GARCH (1,1) is given by: \(GARCH(1,1) : h_t = \alpha_0 + \alpha_1 r_{t-1}^2 + \beta h_{t-1} \); where \(\alpha_0\) is a constant coefficient of market volatility and \(\alpha_1, \beta\) are the historical effects (lag 1 period) from market value and market disturbance respectively.

44
their volatility will affect the valuation because the values of assets are directly dependent on the volatility. Finally, in a rational market, equilibrium asset prices will be affected by changes in volatility. Investors who can reliably predict changes in volatility should be able to better control financial market risks. A number of time-varying risk models have been developed to capture parametric time series information. Besides time varying models, there are also other methods available to forecast risk, like stress testing and Monte Carlo Analysis that are known as scenario analysis. The main objective of these methods is to obtain the most relevant model that is able to represent the 'real' Value at Risk of the portfolio. Through the advance knowledge about the market dynamics, one can estimate the frequency distribution of an event (e.g. Sterling against the US Dollar or behaviour of interest rates). The value at risk is then computed as a product of profit distribution schemes and the probability derived from empirical frequency distributions.

The value at risk approach gives some benefits to the establishment of a robust risk management system. It gives the risk managers more information about normal market dynamics that leads to better risk management. It also provides more transparency in risk management, which could prevent fraudulent practices and human error from going undetected since value at risk provides a consistent and integrated treatment of risk across the institution. However, value at risk is not everything since the managers should avoid two big traps in implementing this approach within the risk management process. Econometric models are sometimes very biased since they are backward looking. Assumptions are necessarily made about the approximations of some parameters of a chosen time series period. Based on those assumptions, the managers predict the market dynamics. If the risk managers rely heavily on this approach, they may become targets for speculative attacks by speculators who may shake the market to gain profits from arbitrage. Moreover, econometric models only respond to small changes in the normal market mechanism whilst it has been evident that most banking crises were caused by economic turbulence. Despite these advantages and

22 This means that we believe that there is a probability of (α) the portfolio will result in negative cash
disadvantages, value at risk is still an important complementary tool in promoting a sound risk management process although it can never substitute for market information. Moreover, value at risk will be very powerful if combined with a good audit and control system and well trained risk managers.

Credit risk

Credit risk is related to the capacity of the counterparties to fulfil their financial contractual obligations in accordance with the agreed terms. Recently, credit risk assessment has been one area to be developed since a lot of evidence shows that underestimating credit risk can be very dangerous for financial businesses. Since credit risk is inherent in the entire portfolio, the bank should always maximise risk-adjusted rate of return by maintaining credit risk exposures within acceptable limits. A sound credit risk management is essential to support sustainability in the banking operations in the long run. Therefore, the importance of having a sound credit risk management has attracted international organisations, such as the Basle Committee and the International Monetary Fund, to pay attention to this matter by issuing documents in order to encourage banking supervisors globally to promote sound practices for managing credit risk. These documents also promote good co-operation between banks and their supervisors so that they will be able to draw useful lessons from past experiences.

In July 1999, the Basle Committee issued a consultative paper on the principles for credit-risk management. The paper emphasises four important areas: the importance of establishing an appropriate credit risk environment; the importance of a sound credit granting process; the importance of maintaining an appropriate credit administration, measurement and monitoring process; and, the importance of adequate control over credit risk. Sound credit risk management is closely related to the assessment of asset quality, the adequacy of provisions and reserves, and the disclosure of credit risk, as also suggested in other Basle Committee documents23 (Basle Committee 1998c). In a

---

23 See also Sound Practices for Loan Accounting (July 1999) and Best Practices for Credit Risk Disclosure (July 1999).
traditional bank, the extension of loans is the prime activity. Lending activities require banks to make judgements relating to the credit worthiness of borrowers; however, these judgements do not always prove to be accurate and the credit worthiness of a borrower may decline over time due to various factors. Therefore, in a traditional bank, a major risk is the failure of counter-parties to perform according to contractual arrangements. Traditional approaches took the probability of losses into account, based on the likelihood of default by more rigorous enforcement of traditional credit processes, such as stringent underwriting standards, strict enforcement and counter-party monitoring.

Along with the rapid development of financial markets, asset securitisation is a really new phenomenon for the banking industry since the banks have opportunities to enhance their liquidity positions by securitising their illiquid assets into marketable securities. Therefore, the argument stating that the role of banks is to transform the terms of contracts is no longer valid. The understanding of credit risk has gradually shifted from traditional loan assessment to the market oriented credit risk assessment.

24 An accounting analytic approach is used by most rating agencies. This method uses financial ratios to estimate firm specific credit quality as a fundamental analysis and puts emphasis on leverage and coverage measures, connected with quality and stability of earnings and cash flow. The result of this approach is a list of discrete ordinal groups that label firms by credit quality. The difference between an accounting analytic approach and a statistical approach relates only to the determination of financial variables to analyse. An accounting analytic approach usually uses financial ratios only (such as Return on Investment, Return on Assets, leverage ratio, sales, etc) in predicting default, while a statistical approach may use other non-financial information. Through the development of statistical models, future defaults are predicted. As noted earlier, statistical models may use other non-financial information in developing the model. Altman and Narayanan (1997) summarise the efforts to identify significant factors that affect default rates in many countries. They use also qualitative information (such as quality of management, leadership, etc) as their significant factors. In regression analysis, the dependent variable is often influenced by variables that are essentially qualitative in nature besides variables that can be readily quantified on some well-defined scale. Since such qualitative variables usually indicate the presence or absence of a quality, one method of qualifying such attributes is by constructing a dummy variable that takes on the value of 1 or 0. The dummy variable so constructed represents two different conditions, like a bankruptcy and non-bankruptcy condition; and this approach can be extended to multilevel dummy variables to estimate multilevel conditions. There are four basic statistical approaches to building credit quality estimation models that seek to predict future default: linear probability models, linear 'discriminant' models, and the 'probit' and 'logit' models (JP Morgan, 1997).

25 Duffie (1994) and Jarrow and Turnbull (1995) proposed an option theoretic approach to predicting the default of a company. This method assumes that a firm has a market value that evolves randomly through time as new information about the future prospects of the firm becomes known. A particular firm is considered not to have the capacity to fulfil its financial obligations when the value of the firm falls so
In order to cope with a more dynamic market environment, risk managers are increasingly seeking to quantify and integrate the overall credit risk assessment within a value at risk statement which captures market variables, such as price movements, rating changes, and default risk. JP Morgan (1997), for example, has introduced a new methodology for market-based credit risk assessment. Market-based credit risk is generally assessed on three factors: probability density functions; correlation between variables; and individual exposures to market volatility. The probability density functions are derived by obtaining the probability of credit instruments migrating from one rating level to other rating levels and the forward market values for each rating empirically. Portfolio VaR is then obtained by combining the probability density function with correlations between variables and market volatility (expected values) (see also Basle Committee, 1999e for current practices and applications of credit modelling). Like value at risk applied in market risk assessment, risk managers should not fully rely on statistical models, since econometric models just use approximated parameters derived from some assumptions in a particular time series period.

**Liquidity risk**

Liquidity risk management is one of the most important activities conducted by the banks since the ability to fund increases in assets and to fulfil financial obligations promptly is crucial to the ongoing viability of any banking organisation. Moreover, the liquidity failure of a bank may adversely affect the system. The banks are required to have the ability to manage their liquidity positions not only on an ongoing basis but also to examine how funding requirements are likely to evolve under various scenarios. The level of sophistication of the process, in fact, depends on the size and sophistication of the bank as well as the nature and complexity of its activities.

Liquidity risk generally takes two forms: market/product liquidity risk; and cash flow/funding risk. Market/product liquidity risk arises when a cash transformation low that the firm's assets cannot cover all its liabilities. This approach is considered richer since the probability of failure is not exogenous; it depends, in particular, on the indebtedness of the firm. The market pricing of risk is also taken into account; and the liquidation value of the firm is not zero.
cannot be conducted at prevailing market prices due to insufficient market activities, like illiquid over-the-counter contracts and when dynamic hedging is applied. Cash flow/funding risk arises when a bank is unable to meet cash flow obligations, which may force early liquidation, thus transforming 'paper' losses into realised losses. The Basle Committee, in February 2000, issued a paper that focuses on developing a greater understanding of the way in which banks manage their liquidity on a global consolidated basis. The paper emphasises several fundamental pillars required for a sound liquidity risk management. First, the bank has to have a well-defined structure for measuring, monitoring and controlling liquidity risk. The strategy should be maintained daily and relayed to senior management and appropriate personnel whose decisions may impact on liquidity positions. The liquidity monitoring should be arranged to cover all possibilities, including funding requirements for off-balance sheet commitments and exposures in foreign currencies. The responsibility for maintaining a sound liquidity position does not fall only on the treasury function since new products can also have a substantial impact on liquidity risk. One basic aspect that is needed in managing liquidity risk is an assessment of all possible future funding needs. Therefore, all bank staff that are responsible for maintaining sufficient liquidity have to be aware of any information that could have an impact on market and public perceptions about the soundness of the institution. Theoretically, liquidity risk can be managed by setting limits on cash flow gaps and by diversification. By constructing maturity ladders, banks allocate each cash-inflow or outflow to a given calendar date from a particular starting point. However, the funding position is sometimes difficult to keep matched as a result of the presence of uncontrollable variables. Second, the banks have to be able to maintain 'good access' to various sources of funds so that they are able to obtain alternative sources of funds to overcome liquidity mismatches. Alternative funds sources may include trading counterparties, correspondent banks, corporate customers and financial markets. The banks should measure the level of readiness of expected financial access and compose the most efficient alternative funds sources in both normal conditions as well as adverse conditions. Reliable contingency plans are required to assure the viability of the banks in the long run. Third, the banks should also have
effective internal control systems to assure that all policies and strategies are fully implemented. Supervisors also have significant roles as external controllers to measure the level of compliance by the management with prudential regulations stipulated by the supervisory authority.

Operational risk

The finance industry, including banking, has become a technology-based industry. Informational advantage is managed using very sophisticated hardware as well as software to deliver more varied and more efficient financial services to customers. On the other hand, the banking industry continues to show an increasing dependence on the reliability and continuity of their electronic data processing (EDP) system. Although a lot of benefits have been gained, the banking system is facing a big potential problem caused by the heavy dependence on those electronic appliances. A systemic problem caused by errors and fraudulent practices may rapidly spread in the computerised settlement system and inter-bank lending relations that have been established fully in a global computing network. The Basle Committee has issued a paper (July 1989) to alert the supervisors to this potential risk. Besides the hardware problem, operational risk is also arising from the failure of internal systems. This highlights the importance of good corporate governance in managing banking business. Other aspects of operational risk may also come from uncontrollable factors, such as major fires or other disasters. The Committee has, recently, formalised a document as a supporting document to the New Basle Accord (Basle Committee, 1998b and 2001h).

Legal risk

Banks are subject to various forms of legal risk. This can include the risk that assets will turn out to be worth less or liabilities to be greater than expected because of inadequate or incorrect legal advice or documentation. In addition, existing laws may fail to resolve legal issues involving a bank; a court case involving a particular bank may have wider implications for banking business and impose costs on it and many or all other banks; and, laws affecting banks or other commercial enterprises may change. Banks are
particularly susceptible to legal risks when entering new types of transactions and when the legal right of a counter-party to enter into a transaction is not established.

C. Current approach to capital adequacy assessment

One of the topics that has been developed by the Basle Committee is capital adequacy assessment, which has been a concern since the early 1980s. The differences in national capital requirements between member countries pushed the Committee to work towards greater convergence in the measurement of capital adequacy. In 1988, the member countries approved the Basle Capital Accord, which implements the framework with a minimum capital standard of eight percent of risk-weighted assets by end-1992. Most international active banks adopted the capital framework.

The capital adequacy framework of 1988 has evolved over time to adapt to developments in the market (see Hall, 2001). There have been two amendments to the capital accord. First, in 1995, an amendment recognised the effect of bilateral netting of banks' credit exposures in derivative products and expanded the matrix of 'add-on' factors. Second, in 1997, an amendment incorporated within the accord the market risk arising from banks' open positions in foreign exchange, traded debt securities, equities, commodities and options. Since the Basle Accord has been internationally accepted by numerous countries outside the G-10 region, it helps to stabilise the international banking system and to minimise the competitive anomalies that arise as a result of the differential application of capital requirements (Hall, 1997). This method was primarily concerned with the credit risk that arose from banking book activities. Based on the agreement among the G-10 central bank governors, an eight-percent minimum risk asset ratio (RAR) was prescribed. It was believed that the minimum RAR chosen would reflect levels of capital maintained by better capitalised banks at that time and should be attained by the end of 1992. The capital of a conventional bank was divided into two tiers - Tier 1 and Tier 2\(^26\). In accordance with the amendment to the capital accord to

\(^{26}\) Tier 1
(a) Ordinary paid up share capital/common stock
(b) Disclosed reserves
incorporate market risks (Basle Committee on Banking Supervision, 1996) banks are entitled to use Tier 3 capital solely to support market risks. Tier 3 capital consists of appropriate short-term subordinated debt. Tier 3 capital is only appropriate to meet market risks, and the sum of Tier 2, added with Tier 3 capital should not exceed total Tier 1 (see also Basle Committee, 1998a).

A new capital adequacy framework was proposed in June 1999 to replace the 1988 Accord (Basle Committee, 1999a). The new capital adequacy framework set forth three fundamental pillars. First, it restates the need for a minimum capital requirement. Second, it proposes a supervisory review of an institution’s capital adequacy and internal assessment process. Third, it promotes the effective use of market discipline as a lever to strengthen disclosure and encourage safe and sound banking practices.

A more definitive proposal was issued in January 2001, which covers the three pillars (Basle Committee 2001a and Hall, 2001). Under Pillar 1, the new proposal recommends

<table>
<thead>
<tr>
<th>Tier 2</th>
<th>(a) Undisclosed reserved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(b) Asset revaluation reserves</td>
</tr>
<tr>
<td></td>
<td>(c) General provision/general loan loss reserves</td>
</tr>
<tr>
<td></td>
<td>(d) Hybrid (debt/equity) capital instruments</td>
</tr>
<tr>
<td></td>
<td>(e) Subordinated loan</td>
</tr>
</tbody>
</table>

The sum of these capital elements will be eligible for inclusion in the capital base, subject to limits and restrictions as follows:

(i) The total of Tier 2 elements will be limited to a maximum of 100 per cent of the total of Tier 1 elements.

(ii) Subordinated term debt will be limited to a maximum of 50 per cent of Tier 1 elements.

(iii) Where general provision/general loan loss reserves include amounts reflecting lower valuation of assets or latent unidentified losses present in the balance sheet, the amount of such provisions will be limited to a maximum of 1.25 percentage point of risk assets.

(iv) Asset revaluation reserves, which take the form of latent gains on unrealised securities, will be subject to a discount of 55 per cent.

Further deductions are also made under the BIS proposal for calculating the risk asset ratio:

From Tier 1

(a) Goodwill

From total capital

(a) Investments in unconsolidated banking and financial subsidiary companies, and

(b) Investments in the capital of other banks and financial institutions.

27 To be capable of becoming part of a bank’s permanent capital Tier 3 must be available to absorb losses in the event of insolvency. Tier 3 capital must have at least the following characteristics: subordinated and fully paid-up, have an original maturity of at least two years, not be repayable before the agreed repayment date and be subject to a lock-in clause which stipulates that neither interest nor principal may be paid (even at maturity) if such payment means that the bank falls below the minimum capital requirement.
the adoption of a more risk-sensitive standardised approach and its operational requirements, credit mitigation in the standardised approach, the treatment of operational risk, and an Internal Rating Based (IRB) approach for banks with more advanced risk management capability. Pillar 2 expects the supervisors to consider a range of options if the banks do not meet the requirements set. Those options include: intensifying the monitoring of the banks; restricting the payments of dividends; requiring the bank to prepare and implement a satisfactory capital adequacy restoration plan; and requiring the banks to raise additional capital immediately. However, the option to increase bank capital sometimes is not the only interim measure. The supervisors should also pay attention to the quality of systems and controls to improve the banks’ positions. Pillar 3 sets out more specific qualitative and quantitative aspects of disclosure that cover: scope of application, composition of capital, risk exposures assessment and management processes, and capital adequacy.

Standardised approach for the capital adequacy measure

The first step toward risk based capital adequacy measurement is to tie the banks’ capital requirements to their estimated credit risks. The assets and off-balance-sheet credit exposures are classified into four different types of credit risk. Each item is weighted by the risk weight for its category (0, 20, 50 or 100 percent). The risk adjusted ratio (RAR) is defined as the ratio of the adjusted capital base (ACB) to the total of weighted risk assets (TOWRA) (Hall, 1992)\(^{28}\). The equity capital formed by the banks will reflect the financial risk experienced by the banks. Operationally, the banks are also required to classify their loan quality into four categories. The classification is based on the repayment capacity. The lower the capacity of the borrower to repay the loan, the higher the allowance should be allocated. This allowance for earning asset losses will reduce the profitability of the banks. An excessive expected loss (low quality of earning

\(^{28}\) Under the implementation of the amended capital accord on 1 January 1998 to incorporate market risk, the risk adjusted ratio RAR is determined as follows:

\[
RAR(\%) = \frac{ACB}{TOWRA + [12.5 \times MRC]}, \quad \text{(MRC: Market Risk Capital Charge)}
\]
assets) may erode the capital of banks. If the bank capital is insufficient, the shareholders will be required to inject more equity capital to avoid insolvency.

In 1996, the Basle Committee extended the 1988 Basle Accord to include risk-based capital requirements for the market risk in banking activities. There are two alternative approaches for setting regulatory capital requirements for the market risks in bank trading accounts: the standardised measurement method and the use of internal models to measure market risk. Under the standardised method, a set of rules assign risk charges to specific instruments and specify how these charges are to be aggregated into an overall market risk capital requirement (Amendment to the Capital Accord to Incorporate Market Risk, Basle Committee on Banking Supervision, (1996)) (see also Basle Committee, 2001b and Basle Committee 1999f for its performance). The standardised measurement method covers interest rate risk, equity position risk, foreign exchange risk, commodities risk and treatment for options. The standard measurement method expresses the market risk more statically than the internal model does. The standard method uses a ‘building-block’ approach in which specific risk and general market risk arising from debt and equity position are calculated separately. The specific risk is calculated to anticipate an adverse movement in the price of an individual security owing to factors related to the individual issuer, whilst the general market risk is calculated to capture the risk of loss arising from changes in market variables. In calculating general market risk, long and short position of different instruments can be off-set, although it is not allowed to off-set long and short positions in calculating the specific risk since it reflects the individual risk of the instruments inherently. Under the new proposals, the risk weighting process uses the rating system more intensively (External Credit Assessment Institutions [ECAIs]). (see Basle Committee, 2001c)
**IRB approach for the capital adequacy measure**

Under strict requirements\(^{29}\), a bank can use its own estimates of the advanced IRB approach – i.e. in respect of loss given default (LGD), exposure at default (EAD) and the treatment of guarantees and credit derivatives (Basle Committee, 2000a and 2001d). The banks are first required to categorise banking book exposures into six broad classes of assets with different underlying credit risk characteristics (i.e. corporate exposures, bank exposures, sovereign exposures, retail exposures, project finance exposures, and equity exposures). The calculation of risk weighted assets involves three components: LGDs, EADs, and assessment of default probabilities (PDs). The banks are allowed to input the values of PDs, but estimates of additional risk factors (LGDs and EADs) have to be derived through the application of standardised supervisory estimates. Basically, the banks are given a chance to estimate the risk components internally.

The use of internal models to assess market risk internally by the banks is subject to the explicit approval by the banking supervisory authority and the approval is only given if the banks fulfil some minimum requirements. The banks have to prove that they have implemented sound risk management systems with integrity and showed accuracy in measuring risks. The implementation has to also involve a sufficient number of skilled risk management staff. In order to assure accuracy in market risk measurement, the supervisory authority will also insist on periodical monitoring and live testing of a bank’s internal model before the model can be used for supervisory capital purposes. The measurement of the soundness of the risk management system is outlined in qualitative and quantitative standards. The qualitative standard includes requirements for the existence of an independent risk control unit that produces an independent review of the risk management process, regular back-testing and stress testing to ensure the financial capability of the bank to face adverse conditions, and the existence of an efficient management structure. The controlling and monitoring process should be

\(^{29}\) Banks must satisfy the following minimum requirements, both at the outset and an on-going basis. Those requirements are: a meaningful differentiation of risk; completeness and integrity of rating assignments; oversight of the rating system and processes; criteria and orientation of the rating system; estimation of the probability of default, data collection and IT systems; use of internal ratings, internal validations, and disclosure requirements.
closely integrated with the day-to-day risk management process. The quantitative standard still gives flexibility to the banks to construct their models to fit the precise nature of the trading activities in the market. However, some minimum standards have to be followed for the purposes of calculating the capital charge. If it is considered necessary, the supervisory authority has discretion to apply stricter standards. The value at risk has to be computed on a daily basis; hence, a capital requirement is also expressed on a daily basis. The banks have the freedom to determine the most appropriate model to be used as long as it can fairly represent the actual risks faced by the banks since no particular type of model is prescribed. The supervisory authority will require the banks to conduct ‘back-testing’ to assess the quality of the banks’ risk management system. If the predictive quality is not satisfactory, the supervisory authority will add a ‘multiplicative factor’ that will raise the capitalisation required. In this way, the introduction of a multiplicative factor provides a positive incentive to maintain the predictive quality of the model. As a matter of fact, econometric models are constructed on the assumptions of normal market conditions with small changes in market variables, but big market shocks that will create big losses may happen at any time. The banks using internal models for meeting market risk capital requirements still need to conduct stress testing to assure their capability to survive in such adverse market conditions.

Recently, the Basle Committee has been studying the state of industry practice in credit modelling and assessing the potential uses of credit risk models for regulatory purposes, including the proper setting for regulatory capital requirements. To match developments in the credit market, a new approach for credit risk modelling can reduce the incentive for a bank to conduct regulatory capital arbitrage since a model-based approach may bring capital requirements into closer alignment with the perceived riskiness of underlying assets. The credit risk model may also produce estimates of credit risk that

30 Value at Risk will be computed based on uniform inputs (10 trading days or two calendar week time horizon, 99 percent confidence level, observation period is based on at least one year of historical data and updated at least once a quarter).

31 The banks may choose variance-covariance matrices, historical simulation or a Monte Carlo simulation process.
reflect the actual composition of each bank's portfolio. As with the implementation of market risk modelling, the implementation of credit risk modelling must also be concerned with other supporting factors. The regulator has to be confident that the credit risk models are not only well integrated with the day-to-day risk management system, but also conceptually sound and empirically validated. However, the supervisory recognition of portfolio credit risk models in the near future seems to be unlikely due to two significant hurdles i.e. data limitation and weakness in model validation.

D. A possible alternative approach

Although the use of internal models was designed to improve upon the accuracy of the standardised approach, Kupiec and O'Brien (1996) claim that internal models have so far failed to measure accurately market risk in the trading account because of different time frames. Internal models extrapolate a long-horizon exposure estimate from a bank's internally generated 1-day market risk exposure estimate. Moreover, the accuracy of an internal model needs to be validated case by case while assessing the precision and merits of the model is very difficult. They claim that there is a significant probability that regulators will be unable to detect poorly performing risk management models.

A different approach, named the Pre-Commitment Approach (PCA) and developed by research economists of the US Federal Reserve, would shift the responsibility for setting market risk capital charges to the banks themselves. Kupiec and O'Brien introduced the concept of PCA in 1997. The behaviour of a bank that focuses on the interaction between the incentives created by fixed rate deposit insurance and a bank's choice of its loan portfolio and its portfolio of market-traded financial assets is modelled. Under PCA, the regulator allows a bank to set its own market risk capital requirement. If the bank generates subsequent losses that exceed its market risk capital 'pre-commitment', regulatory penalties will be imposed. Hence, PCA attempts to supplant regulatory capital requirements that are based on ex ante estimates of bank risk. In PCA, it is assumed that in making investments and deciding financial options, a bank will always
maximise the net present value (NPV) of its shareholders’ claims on future bank cash flow. The NPV of initial shareholders’ claims is determined by several components: the bank’s loan portfolio; the bank’s end-of-period franchise value; deposit generated fee income; the value of the net deposit insurance guarantee of premium paid; the initial value of contingent-liability generated by end-of-period distress cost; and the outside funds raised. The bank management is assumed to always try to maximise the NPV of the initial shareholders’ claims. Since the market risk in trading accounts is equivalent to the risk in the bank’s risky market traded securities portfolio, the banks should pre-commit to maximum losses in trading activities determined by their own capacity. Therefore, the bank is assumed to pay an *ex-post* deposit insurance premium for every excess loss. Through this approach, the bank’s supervisor expects that the banks will carefully assess their own risk taking capability in their operations. It is clearly seen that the supervisor wants to give the responsibility back to the banks instead of the supervisors. In fact, in order to maximise the NPV of shareholder value, the manager will maximise every factor mentioned above. If one portfolio (the loan portfolio for example) cannot be expected to give positive returns, the management might possibly maximise the returns from other portfolios (non-loan portfolios). If the NPV of the loans is negative, the bank will maximise its non-loan portfolio investment either by choosing risk free securities or by undertaking a ‘go-for-broke’ high-risk strategy. Since all of its deposits are guaranteed, an optimal go-for-broke strategy under a negative NPV of the loan portfolio will entail using only risky market-traded securities to maximise the value of deposit insurance. This is the main reason why PCA is only effective for a bank that has a positive NPV for its loan portfolio. If the NPV of the loan portfolio is positive, a bank will avoid excessive holding of high-risk securities to avoid monetary penalties that will finally reduce shareholder value.

2.4. Summary

A sound financial system is essential in supporting sustainable economic development because of its massive contribution to both microeconomic as well as macroeconomic
levels of activities. Instability in the financial system will adversely affect the whole economic development process, possibly imposing very high social costs as a result of economic turmoil. For these reasons, the financial system, including the banking system, has to be efficient, stable and robust so that it has the capability to overcome any economic disturbances. As we have noticed, economic disturbances may come from various factors, including macroeconomic instability, inefficient financial system infrastructure, distortions in market discipline and a lack of quality in regulation and supervision.

The financial regulators cannot fully rely on market forces and let the system regulate itself due to the social costs that could result. The successful implementation of financial regulation has to address some important issues. First, due to the importance of the financial system to everyone, regulators should avoid any monopolistic exploitation. Second, the financial system has to be able to give a minimum level of financial protection to dispersed and unsophisticated depositors. The existence of a banking system is very important to the dispersed and unsophisticated depositors for a number of reasons, including reduced transaction costs, liquidity insurance, information-sharing and delegated monitoring advantages. Ultimately, regulators have to assure systemic stability in the long run.

Financial regulations employed should address not only prudential financial regulation but also business conduct regulation to shape good behaviour by key players. Therefore, financial (banking) regulation should provide the right incentives to promote good governance in the banking system. Nowadays, banking regulations have moved to risk-based banking regulations that are believed to create the right incentives within the banking system. One of the central preoccupations in risk-based banking regulations is capital regulation for banks. It is clear that bank capital should not only provide a static financial cushion, but also be able to create prudent behaviour by the shareholders. Dynamic analysis of shareholder value has been developed to explain the relation
between moral hazard and uncertainty when implementing banking regulation including in the analysis of deposit insurance arrangements and closure policy.

Risk-based capital regulation requires the operation of both a sophisticated risk assessment process \((\textit{ex-ante})\) and asset valuation process \((\textit{ex-post})\) so that the capital level required reflects the potential losses faced by the banks. The attempt to improve the capital adequacy assessment has never stopped. The possibility of incorporating portfolio credit risk model within capital adequacy assessment is being considered. The more accurate the risk assessment, the more reliable the capital adequacy assessment will be.
CHAPTER 3

ISLAMIC BANKING: CONCEPTS AND APPLICATIONS

3.1. Introduction

Financial systems play an important role in sustaining every business activity, whether the business operates in the West, Middle East or in any particular community. Every community is faced with the same set of financial challenges. Productive assets, such as natural resources, labour forces and economic development programs must be financed to maintain and improve the quality of living; hence, the financial system becomes one of the most important elements to support sustainable development in the community.

Every community, in fact, has its own values, which are different from the values of the other communities. These values, which are generally affected by various factors, such as culture, demography and religion, determine the types of needs, which arise. Muslim society, conceptually, has a typical set of financial needs which are derived from Islamic values. According to Islamic teaching, the existing western banking activities are not Islamic because they accommodate certain financial activities which are prohibited. One of the central preoccupations in examining Islamic finance is to understand how Islamic religious rulings affect business operations in a commercial setting (Ahmed, Iqbal and Khan, 1983). The recent development of Islamic banking indicates the awareness of Muslims to have their own financial system that incorporates religious rulings in their financial activities. Islamic banking has been growing rapidly in the last two decades. It has been developing not only in the Middle East region but also in many other parts of the world.

However, the religious aspect is not the only factor to be considered in building a sound and efficient economic base in a commercial setting. The Islamic financial institutions must still be able to meet with reasonable economic efficiency the basic requirements of
both the commercial enterprises and the investors who supply its financial resources. Market players, including investors and depositors, need an advanced financial environment that allows them to conduct economic activities efficiently. Moreover, stability of the financial system is required to support the soundness of the economic environment. This poses a challenge to the financial regulators that allow Islamic banks to operate under their supervision since they have to assure the soundness of the new banking system. Instability in one element of the financial system might adversely affect the whole financial system.

3.2. Islamic Finance: Concepts and Applications

3.2.1. Islamic principles in financial activities

Every individual in his life must determine the presence of satisfaction according to his own criteria. In economics, individual satisfaction is usually measured in terms of utility. The utility, in turn, motivates all economic activities\(^1\). In Islam, the concept of utility is certainly inspired by the concept of welfare (maslaha). According to Shatibi (1987), welfare is built on five fundamentals: life, property, faith, reason and posterity\(^2\). A similar fundamental concept of Islamic economics, which is mentioned by the International Association of Islamic Banks (1996), includes ownership, justice, wealth distribution and the prohibition of interest. Chapra (2000) restates the expression of al-Gazali (1111 A.D) about the objectives of sharia:

\[ \text{The objective of the sharia is to promote the well-being of all mankind, which lies in safeguarding their faith (din), their human self (nafs), their intellect ('aql),} \]

---

\(^1\) An individual would engage in an economic transaction if he could obtain at least a minimum level of satisfaction from the transaction. On the contrary, if the transaction cannot give a minimum satisfaction to the transacting parties, the economic transaction will not happen.

\(^2\) In Islamic concepts, the individuals should harmonize their needs with the concept of maslaha that has been determined in the Islamic teaching. Economic efficiency is not the prime concern since the objectives of the economic process have to be in accordance with the five fundamentals of maslaha.
their posterity (nasl) and their wealth (maal). Whatever ensures the safeguard of these five serves public interest and is desirable'.

Any action undertaken has to promote these five elements in order to provide maslaha for human beings. Islamic banks and their operations are considered to be an integral part of a complete Islamic economic system, and must align with injunctions outlined in the holy Qur'an and the tradition of the Prophet Muhammad (peace and blessing of God be upon him).

Ahmed (1986) states the three basic principles outlined by Islam. First, a human being is not the absolute owner of any resource since they are only the trustees of the God. There are social obligations to be undertaken within the limits set for it. Therefore, Islam always discourages wealth concentration within just a few hands. Second, there is moral or religious guidance in pursuing the acquisition and development of resources (i.e. the economic aspect of man's life). Third, the final focus of the economic activities should be on achieving prosperity for the community, although individuals are allowed to 'own' wealth. Social solidarity is the justification and aim of an Islamic state, so that

---

3 The expression of the absolute ownership is revealed in the Qur'an (3:189) as: 'To Allah belongeth the dominion of the heavens and the earth; And Allah hath power over all things.' However, the bounty of the resources is provided for the prosperity of the whole of human society (2:29): 'It is He who hath created for you all things that are on earth; then He turned to the heaven and made them into seven firmaments. And of all things He hath perfect knowledge.'

4 The importance of acquiring wealth lawfully is revealed in the Qur'an (4:29-30) as: 'O ye who believe! Eat not up your property among yourselves in vanities; but let there be amongst you traffic and trade by mutual good-will; Nor kill (or destroy) yourself: for verily Allah hath been to you most merciful. If any do that in rancour and injustice — soon shall we cast them into fire: and easy it is for Allah'. Islamic teaching also demands all Muslims to spend their money for the welfare of the people and not on wasteful or pleasurable activities (2:219): 'They ask thee concerning wine and gambling. Say, "In them is great sin, and some profit, for men; but the sin is greater than profit." They ask thee how much they are to spend; say "What beyond your needs." Thus doth Allah make clear to you his sign; in order ye may consider.' In conducting the business, the Qur'an also outlines the right conduct for Muslims (4:36) as: 'Serve Allah, and join not any partners with Him; and do good to parents, kinsfolk, orphans, those in need, neighbors who are near, neighbors who are strangers, the companion by your side, the way-farer (ye meet) and what your right hands possess; for Allah loveth not the arrogant, the vainglorious.' and also (4:139) : 'O ye who believe! Stand out firmly for justice, as witnesses to Allah, even as against yourself, or your parents, or your kin, and whether it be (against) rich or poor: for Allah can best protect both. Follow not the lusts (of your hearts), lest ye swerve, and if ye distort or decline to do justice, verily Allah is well-acquainted with all that ye do.'

5 Islamic teaching emphasis the importance of fulfilling social obligations as revealed in the Qur'an (51:19): 'And in their wealth and possessions (was remembered) the right of the (needy), Him who asked,
Muslims, freed from the pressures of material need, would find it easier to fulfil the aims of their life in worshipping God.

Chapra (2000) states that the Islamic perspective toward economics puts emphasis on the socio-economic dimension, where the goals include not only economic well-being but also human brotherhood and socio-economic justice, sanctity of life, prosperity, individual honour, mental peace and happiness, and family as well as social harmony. Maximising wealth and consumption is not the only goal in the life of an individual since there are still social obligations to fulfil. According to Islamic teaching, a society may only achieve a short period of economic prosperity if it neglects the moral fibre of individuals and society since the moral fibre is very essential in forming positive norms within the society and influencing consumer behaviour. A balance between earning and spending and mutual benefit for the whole community should be achieved as it also prohibits unlawful means of acquiring wealth.

Islamic principles in financial activities basically represent moral guidance in running the business. Haron and Shanmugam (1997), as well as in Siddiqi (1986), summarise the basic principles of business according to Islam as:

The principles of Islamic business comprise of honesty, and trade is to be conducted in a faithful and trustworthy manner. Islam conceives trade as an honest effort, an earnest endeavour, and a human striving for earning one's rightful livelihood. Trade manipulations and malpractices aimed at earning unfair profit through operations like hoarding, black-marketing, profiteering, short-weighting, hiding the defective quality of merchandise, and adulteration cannot be regarded as honest trade.

and him who (for some reasons) was prevented.' Islam also emphasizes the remembrance of putting aside self interest in order to support social welfare (180:3): 'And let no those who covetously withheld of the gifts which Allah hath given them of His Grace, think that it is good for them; nay it will be the worse for them; soon shall the things which they covetously withheld be tied to their necks like a twisted collar.'
This moral guidance is adopted when formulating any business instruments that are considered permissible (halal). A modern reinterpretation of the Islamic law of finance has been undertaken by famous Islamic lawyers. They are Al-Khafif, Al-Sanhuri, Zahra, Zarqa, and others\(^6\). The basis of the reformulation of the classical law is simplification and rationalisation with respect to the rapid development in financial activities.

In accordance with the basic principles, any Islamic financial product developed has to accord with those principles. The general rules of Islamic banking and finance have involved simplification of the complexities of the classical religious teaching (fiqh) into a few basic rules or principles. Haron and Shanmugam (1997) identify the general objectives for the existence of banking institution from an Islamic point of view\(^7\). First, Islamic financial institutions can help Islamic society execute financial dealings in respect of the ethical individual values and social values of Islamic teaching. Second, Islamic financial institutions may enable Islamic society to mobilise and utilise financial resources in order to foster economic development and prosperity within the principles of Islamic teaching that assure the rights and obligations of both the individual and the community. Third, Islamic financial institutions are expected to strengthen the fraternal bonds through mutual benefit by promoting economic development. Basically, Islamic financial institutions try to incorporate financial profit and morality as ultimate objectives simultaneously.

According to Khan (1983), the main principles of Islamic banking operations are:

i. Prohibition of the payment of usury in all forms of transaction\(^8\);

---

\(^6\) These Islamic lawyers are recognized by the AAOIFI (Accounting and Auditing Organization for Islamic Financial Institutions, Manama, Bahrain).

\(^7\) The conclusions relate to the Dar Al-Maal Al-Islamic Trust which holds 25 business and financial companies in 15 countries.

\(^8\) In the Islamic concept, capital holder is not allowed to ask for predetermined returns on his capital since the borrower may not achieve the required level of productivity to fulfil his promise; hence it is considered unjust. The prohibition of usury is explicitly revealed in the Qur’an: ‘But Allah hath permitted trade and forbidden usury...’ (2:275). A further discussion about usury and the Islamic perspective toward the application of usury can be found in Antonio (1999), Mills and Presley (1999), and Vogel and Hayes (1998).
ii. Undertaking business and trade activities on the basis of fair and legitimised (halal) profit⁹;

iii. Fulfilling the obligation of giving to charity (Zakah)¹⁰;

iv. Prohibition of monopoly;

v. Co-operation for the benefit of society and development of all religiously legitimised (halal) aspects of business trade and investment that are not prohibited by Islam;

Iqbal (1999) states that modern Islamic banks mostly perform the same function as conventional banks but with some distinguishing features. First, Islamic banks always promote the profit and loss sharing concept to investors as well as borrowers¹¹. Second, there are some moral restrictions imposed on financial activities. Islamic banks are prohibited from financing activities that are not in accord with Islamic teaching, including those that are known to be harmful to society.

The prohibition from accepting or paying usury comes from two main sources i.e. the Qur’an and the tradition of the Prophet. According to Haron and Shanmugam (1997), usury can be divided into two categories i.e. increased usury and delayed payment usury. Increased usury occurs when there is inequality either, in terms of quantity or quality of goods, which are involved in a process of exchange. Delayed payment usury occurs when there is an increase in the values as a result of deferred payments.

Presley and Sessions (1994) state that the prohibition of interest in economic activities may create a number of problems. First, an individual is not automatically entitled to a financial reward for abstinence. Second, there is no moral foundation for the application of interest. Third, money is not equated with capital since a transformation of money to

⁹ Unlegitimised investments consist not only of pork and alcohol-containing food industries, but also of all the business that are not in accordance with the social and religious interests, such as casinos, prostitution and environmentally-harmful industries.

¹⁰ In Islamic teaching, it is obligatory for all Muslims to give a certain part of their wealth or income to poor people (2.5 percent of wealth or income) annually. These charity funds are managed either by charity organizations for consumption or by Islamic banks as benevolent loans to increase the productivity of Muslims in general.
capital is required. Money is not fungible by its own. The increase in the value of capital can only be obtained through real business activities. Finally, lenders and borrowers share in business uncertainty. At the macroeconomic level, Chapra (1985) explores the benefits that can be gained by the implementation of an interest-free monetary system (i.e. an equity-based monetary system).

Besides the prohibition of usury, Islamic teaching also prohibits Muslims from risk-trading activities that are considered as gambling or speculative activities. Islamic teaching, as a matter of fact, differentiates speculative activity form searching to uncertainty when conducting business activities. According to Kahf (2000), speculative activities are prohibited because it is not based on real economic activities. Wealth distribution cannot be based on (dominated by) fabricated chances that are created by vain. This leads to the prohibition on conducting gambling-like economic activities, such as zero-sum derivative transactions.

When it comes to the implementation of the Islamic norms in practice, different opinions towards the standard operations of Islamic financial institutions are most likely to appear. In order to support the standardisation of products of Islamic banks, some countries that operate Islamic banking systems established the National Sharia Councils (NSCs). The main objective of the NSCs is to assure the compliance of Islamic banks with the sharia rules. The members of the NSCs are persons who are well-trained and have sufficient knowledge in business and Islamic law to judge the conformity of a particular product of an Islamic bank to sharia rules.

\[11\] As a matter of fact, there are some types of western financial companies, such as mutual funds
3.2.2. Islamic Financial Activities

A. General Banking Activities

In general, Islamic banking operations have adopted western banking tools and procedures (Khan, 1983). Only if there is a contradiction with Islamic principles do they devise their own tools and procedures to accomplish their banking activities. Islamic banks collect depositors’ funds from (dispersed) depositors like western banks do, but in a different way. Deposits in Islamic banks are divided into two different types, based on a commitment to invest.

a. Savings and current accounts (SA)

Current accounts and savings accounts are provided for depositors who do not want to commit for investment. In this type of deposit, although the depositors allow the bank to take the benefit from the deposit, the bank has to guarantee that they get the full amount of their money back when it is called. The reward given to the depositors is discretionary and not obligatory, and is paid only in the case where the bank is earning substantial profit. The depositors get bonuses as a result of cumulative profits during a certain period.

b. Investment accounts

If a depositor commits for investment, the deposit will take the form of an investment account. In this type of deposit, depositors are dealing with investment risks. If the project generates high returns, the depositors will gain the high returns proportional to the share agreed upon. The account holders will get a share of the profits after a minimum agreed period of the investment. The account holders are not allowed to withdraw their money before the minimum agreed period. If they need to withdraw their money before the minimum agreed period, the depositors either forego their share of the profit or they may be entitled to receive some discounted profit.
depending on the duration of the deposit with the bank. There are two types of investment account:

i. Accounts with authorisation (PSIA\textsuperscript{u})

This account is also known as an unrestricted investment account. The depositors give full authorisation to the bank for investing their money in any project chosen by the bank. Repayment to the depositors is based on the returns of the bank as a whole. Therefore, the repayment depends very much on the quality of the assets of the bank.

ii. Accounts without authorisation (PSIA\textsuperscript{r})

This account is also known as a restricted investment account. The depositors may choose any particular projects that have been chosen by themselves or the bank and will receive a share of the profit according to an agreed percentage. In contrast with the accounts with authorisation, in this kind of investment the repayment (principal and monetary surplus) is based on the performance of the particular project.

In raising capital finance, an Islamic bank has fewer alternatives than a western bank. The prohibition of interest has limited their flexibility to access financial markets, especially in dealing with interest-based financial instruments, since the sources of funds for Islamic banks are only based on sharing agreements. Another source of funds for Islamic banks is the capital market. Like other institutions, Islamic banks have access to funds by selling their external equity in the equity market. Stockholders and unrestricted investment account holders will enjoy the same methods of reward, i.e. profit-and-loss sharing-based rewards, except for voting rights (because of the shareholders’ financial involvement for an infinite time horizon).
## CHAPTER 3

### ISLAMIC BANKING

Exhibit 3.1

Sharing-Based Modes of Financing

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLS Mode</strong></td>
<td><strong>Profit and loss sharing</strong></td>
<td><strong>At the core of Islamic banking</strong></td>
</tr>
<tr>
<td><strong>Mudharaba</strong></td>
<td><strong>Trustee finance contract</strong></td>
<td>Three conditions need to be met:</td>
</tr>
<tr>
<td></td>
<td>The bank provides the entire capital needed for financing a project, while the entrepreneur offers his labour and expertise. The profits (losses) from the project are shared between the bank and the entrepreneur at a certain fixed ratio. Financial losses are borne exclusively by the bank. The liability of the entrepreneur is limited only to his time and efforts. However, if negligence or mismanagement by the entrepreneur can be proven he may be held responsible for the financial losses incurred. It is usually employed in investment projects with short gestation periods and in trade and commerce. It affects both the assets and liabilities sides of banks’ balance sheets. On the liabilities side, the contract between the bank and depositor is known as unrestricted mudharaba because depositors agree that their funds can be used by the bank, at its discretion, to finance an open-ended list of profitable investments and expect to share with the bank the overall profit accruing to the bank’s business. On the assets side, the contract between the bank and the agent-entrepreneur is known as restricted mudharaba because the bank agrees to finance a specific project carried out by a specific agent-entrepreneur and to share the profits according to an agreed formula.</td>
<td>1. The bank should not reduce risk by requesting collateral; it bears exclusively the financial risk. Collateral, however, may be requested to help reduce moral hazard, e.g., to prevent the entrepreneur running away. 2. The rate of the profit has to be determined strictly as a percentage and not as a lump sum. 3. The entrepreneur has the absolute freedom to manage the business. The bank is entitled to receive from the entrepreneur the principal of the loan at the end of the period stipulated in the contract, if and only if a surplus exists. If the enterprise’s books show a loss, this will not constitute default on the part of the entrepreneur, except for negligence or mismanagement.</td>
</tr>
<tr>
<td><strong>Musharaka</strong></td>
<td><strong>Equity participation contract</strong></td>
<td>Banks can exercise voting rights corresponding to their share of the firm’s equity capital. Their representatives can sit on the firm’s board of directors. All parties invest in varying proportions, and have the right to participate in the management of the enterprise.</td>
</tr>
<tr>
<td></td>
<td>The bank is not the sole provider of funds to finance a project. Two or more partners contribute to the joint capital of an investment. Profits (and losses) are shared strictly in relation to the respective capital contributions. It is usually employed to finance long term investment projects.</td>
<td></td>
</tr>
<tr>
<td><strong>Muzar’ah</strong></td>
<td>Traditional counterpart of the mudharaba contract in farming. The harvest is shared between the bank and the entrepreneur. The bank may provide funds and land.</td>
<td></td>
</tr>
<tr>
<td><strong>Musaqat</strong></td>
<td>Traditional counterpart of the musharaka contract in orchard keeping. The harvest is shared among the partners based on their respective contributions.</td>
<td></td>
</tr>
<tr>
<td><strong>Direct Investment</strong></td>
<td>The same concept as in conventional banking. The bank cannot invest in the production of goods and services which contradict the value pattern of Islam, such as gambling.</td>
<td>Bank can exercise voting rights corresponding to their share of the firm’s equity capital. Their representatives can sit on the firm’s board of directors.</td>
</tr>
</tbody>
</table>

Source: Kazarian, 1993; Iqbal and Mirakhor, 1987; and Errico and Farahbaksh (1998)

On the assets side, Khan (1995) divides the form of Islamic financing into two types; direct financing (sharing-based assets) and indirect financing (non-sharing-based assets). Direct financing consists of mudharaba (venture capital) and musharaka (joint
financing). The sharing principle is applicable for commercial purposes only; hence, it is not applicable either for consumption purposes or for non-commercial activities that are not profit-generating. Indirect financing consists of trading-based modes, leasing-based modes and service-based modes.

Exhibit 3.2
Non Sharing Based Modes of financing

<table>
<thead>
<tr>
<th>Non-PLS Modes</th>
<th>Non Profit and loss sharing modes</th>
<th>They are used in cases where PLS modes cannot be implemented, for example, in cases of small-scale borrowers or for consumption loans.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qard al-Hasanah</td>
<td>Beneficience loans  These are zero-return loans that the Quran exhorts Muslims to make to ‘those who need them'. Banks are allowed to charge the borrowers a service fee to cover the administrative expenses of handling the loan, provided that the fee is not related to the amount or maturity of the loan.</td>
<td></td>
</tr>
<tr>
<td>Bai' Muajjal</td>
<td>Deferred payment sales  The seller can sell a product on the basis of a deferred payment in instalments or in a lump sum payment. The price of the product is agreed upon between the buyer and the seller at the time of the sale and cannot include any charge for deferring payments</td>
<td>Contrary to contracts based on the PLS principle, modes such as mark up, leasing, and lease purchase have a predetermined and fixed rate of return and are associated with collateral. In fact, banks add a certain percentage to the purchase price and/or additional costs associated with these transactions as a profit margin, and the purchased assets serve as a guarantee. Additionally, banks may require the client to offer collateral. These instruments can be considered to be more closely associated with risk aversion and they do not substantially differ from those used in a conventional banking system, other than in their terminology and in some legal technicalities. They are considered to conform to Islamic principles because the rate of return is meant to be tied to each transaction, rather than to the time dimension. However, some Muslim scholars advocate a stricter utilisation of such a mode.</td>
</tr>
<tr>
<td>Bai' Salam or Bai' Salaf</td>
<td>Purchase with deferred delivery  The buyer pays the seller the full negotiated price of a product that the seller promises to deliver at a future date. This mode only applies to products whose quality and quantity can be fully specified at the time the contract is made. Usually, it applies to agricultural or manufactured products.</td>
<td></td>
</tr>
<tr>
<td>Ijara</td>
<td>Leasing  Lease purchase  A party leases a particular product for a specific sum and a specific period of time. In the case of a lease-purchase, each payment includes a portion that goes toward the final purchase and transfer of ownership of the product.</td>
<td></td>
</tr>
<tr>
<td>Ijara wa iqtina</td>
<td>Service charge  A party undertakes to pay another party a specified amount of money as a fee for rendering a specified service in accordance with the terms of the contract stipulated between the two parties. This mode usually applies to transactions such as consultations and professional services, fund placements, and trust services.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Kazarian, 1993; Iqbal and Mirakhor, 1987; and Errico and Farahbakhsh (1998)
Vogel and Hayes (1996) divide the forms of Islamic financing into two types: equity-like financing and non-equity-like financing. Non-equity-like investments that are provided for the short term consist of working capital financing and leasing. Equity-like investments that are provided for long term financing consist of profit-and-loss-sharing-based loans. The sharing-based modes of financing in Islamic banks are summarised in Exhibit 3.1, while non-sharing modes are summarised in Exhibit 3.2.

Since Islamic banks operate in accordance with different principles, they adopt different basic practices from western banks. Most of the differences result from the application of the sharing concept, either in application on the funding side (i.e. depositors/investors) or the lending side (i.e. borrowers). Errico and Farahbaksh (1998) summarised the comparison of banking framework between Islamic banks and conventional banks in the form set out in Exhibit 3.3.

### Exhibit 3.3
**Comparison of Banking Frameworks**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Paradigm Version of Islamic Banking</th>
<th>Conventional Banking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal value guarantee</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Demand deposits</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Investment deposits</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Equity-based system where capital is at risk</td>
<td>Yes, directly</td>
<td>Yes, indirectly</td>
</tr>
<tr>
<td>Rate of return on deposits</td>
<td>Uncertain, not guaranteed</td>
<td>Certain and guaranteed</td>
</tr>
<tr>
<td>Mechanism to regulate final returns on deposits</td>
<td>Depends on bank’s performance / profit from investments</td>
<td>Irrespective of bank’s performance / profit from investments</td>
</tr>
<tr>
<td>PLS principle is applied</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Use of Islamic modes of financing: PLS and non-PLS</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Use of discretion by banks with regard to collateral</td>
<td>Possible for reducing moral hazard in PLS</td>
<td>Yes, always</td>
</tr>
<tr>
<td>Bank’s pooling of depositors’ fund to provide depositors with professional investment management</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Errico and Farahbaksh (1998)
Basic features of financing techniques

Conceptually, the focus of Islamic modes of financing is on PLS as an alternative to interest-based financing. However, Khan (1995) reports a divergence between theory and practice in the order of preference for these modes of financing. Most Islamic banks depend on mark-up based techniques. To understand this controversy, we need to go deeper into the basic features of Islamic financial techniques. There are five basic modes of finance: principal-agent financing (mudharaba); joint financing (musharaka); leasing (ijara); deferred payment (bay’ al-salam); and mark up (murabaha). All of the Islamic financial techniques, practically and theoretically, are reflected in these five basic models. Each basic model has its own financial characteristic that differs from the others. Mudharaba is the most risky mode of finance since the capital-provider (an investor / bank) does not have control over the management while he has to be responsible for the whole of any financial losses arising from the use of such finance. In contrast with mudaraba, musharaka is less risky since the capital-provider has some control over the business, besides other parties who are also risking their own capital in the business. In the case of bay’ al-salam, although the return has been fixed at the beginning of the contract, there is still uncertainty over the future prices of the commodities involved in the contract. Therefore, the capital provider has to be able to forecast the future price of the commodities. The practice of leasing in Islamic banks is just the same as the leasing techniques adopted by conventional banks. The finance provider puts at stake the whole of his capital investment as well as the opportunity cost of capital for the whole period until the capital is received back. The safest mode of financing in Islamic banking is mark-up. The finance providers bear risk only for the period in which a spot sale is to be made and the goods handed over to the client. Mark up based financing just requires knowledge of the current prices of the goods to determine the financing and return on it. In many cases, if the financial providers do not know the appropriate level of return, they use other financial indexes as a benchmark, like interest rates. The comparative features of Islamic financing techniques are summarised in Exhibit 3.4.
Exhibit 3.4
Comparative Features of Islamic Financing Techniques

<table>
<thead>
<tr>
<th>Nature of financing</th>
<th>Mudharaba</th>
<th>Musharaka</th>
<th>Leasing</th>
<th>Mark up</th>
<th>Bay’ al-Salam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of capital provider in management</td>
<td>Investment base</td>
<td>Investment base</td>
<td>Leasing base</td>
<td>Combination of debt and trading</td>
<td>Combination of debt and trading</td>
</tr>
<tr>
<td>Cost of capital</td>
<td>Nil</td>
<td>Full control</td>
<td>Full control on the use of finance</td>
<td>Full control on the use of finance</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Source: Khan (1995)

B. Other Islamic Financial Activities

The Islamic financial system consists of several elements. Besides Islamic banks, there also exist Islamic insurance companies, securities companies and non-bank investment companies, such as trust companies. However, the development of this industry is still in its early stages. The existence of insurance companies in the Islamic economic environment is relatively new. It has taken a long time for Islamic economics scholars to find legitimacy for insurance in Islam. The prime concern of the debate is because of the prohibition of gambling in economic activities. Conceptually, Islamic economics differentiates between facing business uncertainty and conducting gambling activities; even though, when it comes to daily activities, it is difficult to distinguish between the two. Having had a long debate concerning its religious legitimacy, Islamic scholars have realised that insurance is a basic human need, as accidents and their financial consequences, which require insurance cover, are universal (Siddiqi (1986)). Accordingly, he states that the basic principle of insurance, from an Islamic point of view, is aimed at relieving the deprived and destitute from want and misery so that not a single member of society remains un-provided for in his basic needs. Accordingly, a new form of Islamic insurance arrangement, called takaful, has been widely accepted by religious scholars as well as the financial community. The insurance arrangement is not a bilateral contract transferring a known risk, but rather it is a charitable collective
enterprise by which Muslims pool resources to aid each other in the event of casualty or loss.

Islamic securities markets have, so far, not achieved significant development in Islamic financial markets. Moreover, the development of securities markets in some countries has differed from that of other countries. In some countries, like Malaysia and Indonesia, financial markets are structured using a debt-like contract that is less acceptable to some Islamic financial experts from other parts of the Islamic world, like Middle-east countries. However, attempts to secure convergence in perception have never stopped, especially after the establishment of the AAOIFI. Conceptually, financial instruments in Islamic financial markets must be based on profit-and-loss sharing (mudaraba or musharaka), which is basically like equity participation. There are three common types of equity-based financial instruments. The first type is mudaraba funds. The mudaraba funds mechanism creates opportunities for investors to get involved in large project financing. This form of investment is considered as a direct financing scheme. Funds so pooled can be used to conduct business using lawful contracts. Mudaraba funds are financially similar to mutual funds where investors share in profits and losses. The second type is the common share. This kind of investment has been facilitated by the custom of using conventional companies which issue common stock as fund raising vehicles, which may even substitute for Islamic partnerships. Like other Islamic investment schemes, share companies cannot be formed for Islamically-invalid purposes, such as production of liquor or other harmful goods. The third type is the revenue bond. An existing company can issue revenue bonds (muqarada bonds) and sell them to investors for the purpose of financing a specific prospective project or

12 Malaysia operates debt-based instruments (like bonds) in their Islamic financial markets. The most crucial thing for the Malaysian Islamic financial expert to determine the Islamicity of those instruments is the underlying asset. However, some Islamic financial experts have sought convergence in the use of Islamic financial instruments in order to attract Islamic investors from other parts of the Muslim world. They suggest the implementation of equity-based financial instruments instead of debt-based financial instruments (Rosly and Sanusi, 1999).

13 The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) is established to standardize Islamic banking operations. Through the implementation of the accounting standard internationally, Islamic banks might interact easily. This accounting standard might even give a correct
activity separable from the company’s general activities. The profits of this separate activity are split according to an agreed percentage. The contract may provide (non-binding) for future retirement of the bonds at their then market price, and often provides that a specific percentage of the investor profit share is paid periodically to the holders of the bonds to retire their investment in stages.

The restrictions on the sale of debt for debt prohibit trading activities in mark-up based instruments, like murabaha, al salam, ijara and other mark up instruments, in the secondary market. The sale of debt for debt is discounted trading on fixed-return instruments that yield discounted profit margins. The majority of religious scholars suspect that some of these transactions involve usury (riba). However, there is a major innovation that has now been accepted that sees securities as representing capital interest in mudaraba or musharaka partnerships reflecting not personal partnership interest but shares in the ownership of the enterprise. The advantage of this construction is that co-owners are allowed to sell their interests to third parties without having to seek the permission of other co-owners. This means that the ownership has become tradable. This concept can be applied in equity and equity-like product trading.

3.2.3. Financial risk exposures of Islamic banks

Islamic banks face slightly different financial risks from western banks. According to Beikos (1997) of Capital Intelligence, Cyprus, as also discussed in Errico and Farahbaskh (1998), Islamic banks exhibit higher levels of financial risk than conventional banks do for a number of reasons. First, as most of the investments of an Islamic bank are on a profit-and-loss-sharing basis, the variation of the rate of ultimate return to the bank of its investments is greater. This argument is, however, not fully acceptable since most Islamic banks, currently, are predominated by non profit-and-loss-sharing investments. Second, Islamic banks suffer from liquidity risk since a large proportion of their assets is in non-liquid form. Third, Islamic banks are heavily understanding about Islamic bank activities to other financial institutions outside Islamic banking systems.

76
exposed to the risk of exchange rate movements since they are not allowed to hedge their positions. Finally, Islamic banks are more exposed to the risks arising from changes in government fiscal and monetary policies than conventional banks as they are participating in profit-and-loss-sharing modes with business enterprises.

Homoud (1994) states that Islamic banks are basically exposed to several financial risks i.e. liquidity risk, credit risk, capital structure (solvency) risk and currency risk. He states that the composition (profit-and-loss sharing and non profit-and-loss sharing) of assets and liabilities of an Islamic bank should be maintained in balance. Obaidullah (1998) states a similar classification for financial risks. He also emphasises the role of investment deposits that he assumes to be equal with tier-two equity capital, which performs a function as financial buffer.

i. Credit risk

An effective credit risk management is a critical component of a comprehensive risk management and essential to the long-term success of any banking organisation. An Islamic bank will be able to maximise its risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. A sound credit risk management, therefore, should be implemented for the entire portfolio as well as for the risks in individual credits of transactions. The principles for a sound management of credit risk, outlined by the Basle Committee of July 1999, cover some important areas. First, the bank should establish an appropriate credit risk environment. The boards of directors are required to regularly review credit risk strategy that reflects the banks' risk taking capacity. The position of senior management is critical since they are involved directly in risk-taking activities. At the operational level, the strategy implemented should cover all products and activities that contain credit risk. Second, the bank should operate under sound lending procedures. Sound and well-defined lending procedures are required since a bank always faces adverse selection problems in choosing between potential projects. The sound and well-defined lending procedures should also cover

and give a chance for mutual interactions between those two different systems.
legal lending limits that might prevent a bank from over-concentration in giving loans. Legal lending limits might also prevent moral hazard problems caused by over-financing to related parties. Third, the bank should maintain an appropriate credit administration, measurement and monitoring process. An adequate information system plays an important role in supporting such continuous processes. Information lags and inaccuracy may result in inappropriate decisions being taken by executing management. Forth, the bank should ensure adequate control over credit risk. The credit risk management process will ultimately depend on corporate governance. There should be good communication between the board of directors, the executing/senior management and all parties that are involved in the risk taking process to make sure that the policy set has been fully implemented. Finally, the supervisors should always require that banks have an effective system in place to identify, measure, monitor and control credit risk as part of an overall approach to risk management. As mentioned earlier, Islamic banks have two different types of assets: non profit-and-loss sharing-based (fixed-claims) and profit-and-loss sharing-based of assets (variable-claims).

**Fixed claim types of assets**

Non profit-and-loss sharing assets of the Islamic banks are basically the same as the debt-based assets of western banks except for one thing; according to the sharia principles, Islamic banks are not entitled to collect extra payments for late payment\(^\text{14}\) (Khan, 1983). In practice, it is difficult to differentiate between incapable debtors and capable debtors who are unwilling to pay; hence, an efficient legal system that could provide arbitration to solve business disputes is deemed necessary. Some financial experts state that since Islamic banks do not have a built in mechanism to prevent delay in repayment, Islamic banks are likely to witness a greater incidence of defaults\(^\text{15}\). In order to overcome this complication, there have been several sharia-approved ways to minimise the risk of default, such as holding responsible a financially-capable debtor

\(^{14}\) It is mandated in the sharia law to free the indigent debtors from indebtedness. Delinquency caused by explainable reasons cannot be penalized.

\(^{15}\) The application of interest in giving loans can be viewed as a built in incentive for the borrowers to repay the loans as soon as they can since delaying repayments means paying additional costs.
who delays payment of the loan without any reasonable explanation, and to compensate
the lender for any loss resulting from late payment. In addition, Islamic banks are
allowed to hold collateral to minimise moral hazard.

Technically, Islamic banks can benefit from the recent development of credit risk
assessment techniques by western banks, although Islamic banks seem to require less
sophisticated technical tools for the assessment of credit risk. The application of some
statistical tools to assess financial performance, as a matter of fact, has been carried out
since the early sixties. Numerous studies were devoted to assessing one’s ability to
combine publicly-available data with statistical classification techniques in order to
predict business failure. In his early studies (Altman with his Zeta analysis, 1968) has
provided stimulus to other papers. There have been myriad studies about business
failure classification models done in 21 countries. Altman and Narayanan (1996)
explain that business failure identification and early warnings of impending financial
crisis are very important. Countries throughout the world have been concerned with
individual entity performance assessment. Some recent statistical techniques, such as
multiple discriminant analysis, logit analysis, probit analysis, and bayesian discriminant
analysis, have been applied to construct a failure classification model. Fisher Black and
Myron Scholes and, subsequently, Robert Merton have introduced a different approach
to predicting the future prospects of a firm by using market values, which evolve
randomly through time. The basic assumption of this approach is that when the value of
the firm falls so low that the firm’s assets are worth less than its financial obligations,
default occurs. These statistical approaches would help the Islamic banks and their
supervisors in assessing the quality of the loaned funds.16

16 Banking regulation also requires the banks to classify their earning assets into five categories
depending on the probability of default. The higher the probability of default of the bank assets, the more
the bank should provide for by way of allowances for earning asset losses. The assessment process
includes some determining factors, such as business prospects, financial condition and repayment
capacity. Asset qualities are usually classified as ‘current’, ‘non-current’, ‘doubtful’ and ‘loss’. The
**Variable types of assets**

In the real world, real asset values might be higher or lower than expected, or even negative. In the case where the return is negative, the bank cannot claim even for the principal amount. The expected return of a project depends on internal factors and external factors. Internal factors relate the expected return to individual performance (i.e. effort and skill). External factors relate the expected return to the performance of the industry in which the funds are invested. Accurate information that performs a function as benchmarks can reduce the risk of the adverse selection problem. Often, the financing is given to extend businesses by lending the borrowers additional working capital. Since the business is already established, the banks find it difficult to obtain a 'fair' profit sharing index. Alternatively, Islamic banks use a benchmark to measure the real productivity and compare it with its internal rate of return. Some Islamic banks use industry indexes and some of them use interest rates to determine a desired level of income share.

**ii. Market risk**

Islamic banks are exposed to market risks since they are involved in trading activities. According to Obaidullah (1999), market risks in Islamic banks can be grouped into three major categories i.e. equity price risk, currency risk and commodity risk.

**Equity price risk**

Islamic banks are able to invest their funds in terms of financial participation in a variety of companies through stock buying in the capital market or direct placements. Direct placements - As reviewed earlier, Islamic banks, through profit-and-loss-sharing scheme, are able to conduct equity based financing, either in particular projects or in the companies. In direct placement schemes, the Islamic banks expect future growth of net asset value that is usually realised in terms of dividend payments. Market forces, in this case, do not directly affect the value of investments. Equity market investments - Conducting investment activities through the capital market requires a higher level of classification does not only depend on the delinquency period, but also on other aspects that may indicate
skill by Islamic banks since the value of investments (value of the firm) is not only affected by the financial performance of the companies themselves but also by market sentiment, as illustrated in Exhibit 3.5. There are two kinds of motivation for conducting stock trading activities. Pure investors expect monetary surplus from dividend payments, whilst pure speculators expect monetary surplus from capital gains. Islamic banks should recognise the most dominant market forces and other market characteristics that will potentially affect their investments. In a capital market that has just reached an emerging stage (assumed to be an imperfect market), one cannot expect stable stock market prices. Therefore, in some countries, the banks are not allowed to conduct transactions in the stock market.

Exhibit 3.5
Determining aspects for investments in a stock market

The ‘true’ quality of the loan.

The value of investments is affected by dividend payments $\frac{\partial I}{\partial t} dt$ and future stock prices $\frac{\partial I}{\partial z} dz$. The dynamic form for investment value is given by $dI = \left(\frac{\partial I}{\partial t}\right) dt + \left(\frac{\partial I}{\partial z}\right) dz$. In fact, the future stock price is affected by expected future dividend payments and other market forces; hence, $z$ is a function of earning $(E)$ and exogenous market forces or $z : f(E, M)$. The investment value then becomes $dI = \left(\frac{\partial I}{\partial t}\right) dt + \left(\frac{\partial I}{\partial E}\right) dE + \left(\frac{\partial I}{\partial M}\right) dM$. 
**Currency risk**

Islamic banks, which are active in facilitating international trade and business activities, are exposed to currency risk. The currency risk results from foreign exchange transactions and all forms of investments denominated in foreign currencies, including overseas investments. The more volatile the exchange rate, the higher the level of risk the currency trading or overseas investment will pose. Currency risk that results from currency trading activities includes the net spot position, irrecoverable guarantees and any other item representing a profit and loss in foreign currency.

However, currency transactions on a deferred basis are not permissible according to the majority of sharia scholars. Currency trading wherever undertaken by an Islamic bank is on a spot basis. Therefore, limiting currency risk is much more difficult for Islamic investors than for their non-Islamic counterpart, since risk-curbing measures that are commonly used in conventional finance theoretically are not available to Islamic investors. Some Islamic financial experts set forth the needs for hedging instruments in economic transactions. They argue that Islamic banks are allowed to provide hedging instruments as long as those instruments are accompanied by real underlying transactions (Khan and Chapra, 2000). Islamic banks do not require a sophisticated market risk assessment tool since Islamic banks are not allowed to generate profit from recently-developed derivative instruments.

**Commodity price risk**

Islamic banks are also exposed to (commodity) price risk. In trading activities, profits generated are made through agreements between the bank and customers. Profits are generated from the difference between buying prices and predicted selling prices, for example salam financing. The salam concept is usually used to finance agricultural production activities, like rice growing activities, wheat, etc. The payment is settled at the beginning of the contract, which is applied for a short-term period, ranging from 2 to 6 months.
iii. Liquidity risk

As reviewed earlier, Islamic banks have two different types of deposits i.e. savings/current accounts and investment accounts. Different proportions of each type of deposit will pose different levels of liquidity risk. The analysis of a fractional reserve banking system may be beneficial in explaining how the optimal allocations are different when the objective is to reduce the risk of future bank runs. As Islamic banks offer two different schemes of investment, savings/current accounts depositors are allowed to withdraw their funds at any time they like, while investment account depositors have to fulfil the term of investment agreed upon. In the first case, let us assume that the liabilities side of an Islamic bank is dominated by savings/current accounts. The liquidity risk arises as the depositors try to maximise their consumption utility by either withdrawing their funds earlier or later. Stability will be achieved only if the expected return from future consumption is greater than present consumption ($\rho R \geq 1$). $\rho$ is a minimum expected return, which is represented as a discount factor, whilst $R$ represents the expected return. An Islamic bank may have two types of depositors. The first type of depositor is a common depositor, who always tries to maximise returns and ignores whether the investment is religiously-prohibited or permitted. A common depositor who chooses an Islamic bank when the return for depositors given by the Islamic bank is higher than for a conventional bank will benchmark the deposit rate of conventional banks as his minimum expected return. Once the return by the Islamic bank goes lower than the deposit rate, the opportunity

---

18 Diamond and Dybvig (1987) have inspired a simple model of liquidity insurance in a depository institution. The analysis is, however, important in explaining optimal allocation of resources in which banks collect the endowments of deposits (deposits) and invest a fraction of them in long term investments whilst the banks offer depositors the possibility of withdrawal on demand.

19 Case 1: Liabilities are dominated by savings/current accounts

The depositors will maximise his consumption utility ($U$):

$$
\max_{C_1, C_2, d} U = \pi_1 u(C_1) + \rho \pi_2 u(C_2)
$$

subject to :

$$
\pi_1 C_1 = 1 - I
$$

$$
\pi_2 C_2 = R I
$$

as the expected consumption ($\pi_1 C_1$ and $\pi_2 C_2$) at period 1 and 2 respectively. $\pi_1$ and $\pi_2$ represent the probability of taking action in period 1 and period 2.
cost rises ($\rho R < 1$); therefore, no optimal allocation exists. The common depositors, in
that condition, are impatient to withdraw their funds earlier. On the contrary, with a
religious-driven depositor, his choices are constrained by religious rulings. His
minimum expected return may be at zero since he is prohibited from dealing with
interest-based banks. He will place his funds with Islamic banks as long as the expected
return is not negative. This indicates the importance of maintaining compliance with
sharia rules by Islamic banks. If an Islamic bank is suspected of having a low level of
compliance with the sharia rules, it may trigger religious-driven depositors (assumed
patient depositors) to pull their funds out of the banks.

In the second case, let us assume that the liabilities side of an Islamic bank is dominated
by investment accounts which are based on profit-and-loss sharing and represents
medium term contracts. In the condition where the deposit claims are tradable among
the investors, investment-based deposits have the potential to promote optimal resource
allocation without causing potential instability in the banking system\textsuperscript{20}. Therefore, the
more the investment deposits dominate the Islamic bank liabilities, the more flexible the
Islamic banks manage their liquidity schedule. Islamic banks have few financial sources
to fulfil their liquidity needs. The prohibition on holding debt instruments has made
Islamic banks totally reliant on their ability to solve their liquidity mismatch. The
absence of secondary markets exacerbates liquidity risk in the Islamic financial sector.
In most countries that operate Islamic banks, liquidity instruments from central banks
are not even provided since debt based instruments are not allowed. Inter-bank money
market instruments should also be based on profit and loss sharing.

\textsuperscript{20} Case 2: Liabilities are dominated by investment accounts
In Jacklin (1987), as discussed in Freixas and Roschet (1995), the price equilibrium is determined by the
dividend distribution, $\pi_1 = \pi_2 \frac{d}{p}$. $d$ and $p$ represent dividend payment and price of the participation
unit. In the analysis, the participation units are assumed marketable. The expected consumption level will
be $C_1 = \frac{d}{\pi_1}$ and $C_2 = \frac{R(1-d)}{\pi_2}$. This equilibrium leads to a similar budget constraint faced by debt-
based contracts arranged by debt-based depository institutions: $\pi_1 C_1 + \pi_2 \frac{C_2}{R} = 1$. 

84
Islamic banks solve their liquidity needs in a number of ways. First, Islamic banks minimise maturity gaps between their assets and liabilities. Second, Islamic banks may invest in marketable and sharia-approved equity based investment securities, like stocks, mudaraba-bonds and mudaraba security funds. Third, in some countries, Islamic banks may invest in debt-like financial securities to fulfil their liquidity needs.21

iv. Operational risk

As intermediary institutions, Islamic banks face the same types of operational risk as conventional banks. Breakdowns in internal controls and corporate governance might occur that could lead to financial losses through errors, fraud, or failures to perform in a timely manner. Other aspects of operational risk include major failure of information technology systems or events, such as major fires or other disasters.

v. Legal risk

By definition, an Islamic bank is a bank that voluntarily complies with Islamic law besides complying with local financial and banking regulation. Since Islamic banks have to comply with sharia principles, they should be sure that the uses of the funds will not contradict sharia principles, such as liquor production, casino, prostitution, etc. If the sharia board or the bank finds moral misuse of the funding, Islamic banks have to withdraw their funds. This (morally) legal constraint may produce potential disputes since, in practice, there may be some cases that are difficult to judge whether those activities are in conformity with sharia principles or not. In order to solve this problem, in most countries, the national sharia boards establish general guidance for the Islamic conduct of business (Fatawa). Moreover, the attempts to achieve international convergence in sharia-approved activities within Islamic banks has been started by formulating international guidelines that have been circulated and approved by Islamic banks around the world.

21 Khan and Chapra (2000) also mention the current development in providing Islamic banks liquidity support. It includes the possibility of formalizing the inter-Islamic bank money market and lender of the last resort facilities for Islamic banks.
More generally, the financial risks of Islamic banks as compared to conventional banks are summarised in Exhibit 3.6. As illustrated, there are three additional areas (the shaded areas) that should be of concern in supervising Islamic banks i.e. assessing income risk, the legal risk relating to the compliance with sharia rules, and capital structure risk.

**Exhibit 3.6**
A comparison of financial risks facing conventional and Islamic banks

<table>
<thead>
<tr>
<th>Type of financial risk</th>
<th>Items to be concerned with</th>
<th>Western banks</th>
<th>Islamic banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Credit risk</td>
<td>Default value at risk</td>
<td>Default value at risk</td>
<td>Income expectation for sharing-based assets</td>
</tr>
<tr>
<td>2 Market risk</td>
<td>Volatility of market variables</td>
<td>Volatility of market variables</td>
<td></td>
</tr>
<tr>
<td>3 Liquidity risk</td>
<td>Maturity mismatches and alternative funding sources</td>
<td>Maturity mismatches and alternative funding sources</td>
<td></td>
</tr>
<tr>
<td>4 Operational risk</td>
<td>Hardware/system problems and fraud</td>
<td>Hardware/system problems and fraud</td>
<td></td>
</tr>
<tr>
<td>5 Legal risk</td>
<td>Compliance with local legal framework</td>
<td>Compliance with local legal framework</td>
<td>Compliance with sharia rules</td>
</tr>
<tr>
<td>6 Capital structure (solvency risk)</td>
<td>Level of capitalisation</td>
<td>Level of capitalisation</td>
<td>Composition of capital, including investment deposits</td>
</tr>
</tbody>
</table>

### 3.3. The Current Regulatory Framework for Islamic Banks

**3.3.1. Regulatory concepts**

*Religious roots (fiqh)*

Administration/regulation is recognised in the Arabic word ‘yudabbiru’, which has several meanings. The word means directing, conducting, regulating and optimising. According to sharia, the regulation is implemented as a delegation of authority from the
public to improve trust and confidence, which should be conducted in accordance with the sharia principles (Al-Buraey, 1990). The objectives of the regulation are providing justice and delivering prosperity (social equity) and efficiency. The regulation is conducted as a continual process to find any possible improvements according to the concept of maslaha, as indicated in Exhibit 3.7. The analysis of possible improvements should involve all market participants.

Exhibit 3.7  
The fiqh concept of regulation

Coverage of Regulation
As reviewed earlier, Islamic banks exist to deliver religiously-approved financial services. An Islamic banking system should have financial soundness and religious (sharia) compliance. Khan and Chapra (2000) state the three reasons why Islamic banks need a set of prudential regulations. First, Islamic banking regulations should ensure the sustainable systemic stability of the banking system, which can positively contribute to economic developments. In an absence of sound systemic regulation, the failure of a corporation may destabilize the whole banking system. Once the depositors lose their confidence in the banking system, bank runs may possibly happen. The other reason for

---

22 It can be found in the Holy Qur’an: X:3, X:31, XIII:2 and XXXII:5.
systemic crises is because the assets and liabilities of the banks are interconnected. A liquidation process without proper management may damage the whole payment system. Second, there is a need to ensure an adequate level of compliance with the sharia rules. Third, in a global financial system, Islamic banks should consider their international acceptance by the other internationally-operating financial institutions. A close co-operation among the Islamic banks and other conventional financial institutions will be very beneficial to the development of Islamic banks themselves. Therefore, without losing its conceptual distinctions, Islamic banks need a set of banking regulations that promotes soundness and stability in the long run.

The idea of establishing sound business practices through a sound auditing and control process is implicitly stated in some verses of the Qur'an. There are at least three basic principles that can be used as the basis of the supervisory process. First, the encouragement of transparency in any aspect of business. As reviewed earlier, transparency plays an important role in promoting prudent behaviour by the banks, prudential banking practices and, ultimately, a sound banking system. Asymmetric information existing between market players reduces market efficiency and may possibly create moral hazard within the system. This idea is, however, similar with current supervisory trends that emphasises a higher level of transparency. This includes the requirements for minimum disclosures, risk assessment and a fair asset valuation process, and other informational banking regulations. Second, the encouragement of fair treatment and competence. Fair treatment will basically support a sound market mechanism. Excessive protection of incompetent market players will ultimately reduce

---

23 There are basically three operational distinctions between Islamic and western banks as a result of the adoption of religious concepts. First, there are restrictions on Islamic banks investing their funds only in religiously approved investments. Second, the prohibition of speculation (gharar) has prevented Islamic banks from dealing with speculative short term investments, such as the trading of derivative instruments. Third, the prohibition of usury in transactions makes the financial structure of the Islamic banks distinct from the western banks.

24 (2.147) 'The truth is from thy Lord So be not at all in doubt.' (49:6) 'O ye who believe! If a wicked person comes To you with any news, Ascertain the truth, lest Ye harm people unwittingly, and afterwards become Full of repentance for What ye have done.'

25 (28:26) 'Hire him! For the best (man) that thou canst hire is strong, the trustworthy.'

---

88
market efficiency and market competitiveness in the long run. Third, the encouragement of regulation enforcement.

Exhibit 3.8
General objectives of a supervisory framework for Islamic banks

The enforcement of regulation is one important aspect of establishing a sound banking system. Goodhart et al. (1999) report that some banking problems in some countries are caused by weak regulation enforcement. Islamic teaching contains values that are not in conflict with modern banking supervisory principles. It may even strengthen the argument that, without losing their identities, the banking supervisory authorities that operate Islamic banks can benefit from recent developments in the western banking supervisory framework. The general framework for a supervisory process for Islamic banks is shown in Exhibit 3.8.

---

26 (5:8) 'O ye who believe! Stand out firmly for Allah, as witnesses to fair dealing, and let not the hatred of others make you swerve to wrong and depart from Justice. Be just: that is next to piety: and fear Allah. For Allah is well-acquainted with all that ye do.'

27 The core principles for effective banking supervision, outlined by the Basle Committee, contain the general Islamic norms. Fundamental precepts, as reported by Hall (1997), cover several ideas. First, it is aimed at maintaining confidence in the financial system. Second, it encourages market disciplines and enhances market transparency and surveillance. Third, it gives the supervisory operational independence,
The prudential regulations for Islamic banks should be reviewed continuously since there are always differences between the concepts and applications. Errico and Farahbaksh (1998) report that the current practices of Islamic banks diverge from the original concepts in several important ways. First, in order to gain public confidence and especially to avoid bank runs, the capital value guarantee is implicitly or even explicitly written in the laws and regulations. Second, in the highly competitive and global financial system, Islamic banks have to compete with more competitive and long-established conventional banks.

The religious aspect is not the only factor attracting investors; Islamic banks have to consider the economic reasons. Therefore, in some cases, the profit-loss sharing-concept is not strictly applied. Some Islamic banks guarantee the minimum expected return for investors, hence the investors are not dealing purely with investment risk. Third, most of the financing activities are carried out through non profit-and-loss sharing modes. Fourth, discretion with regard to collateral is common in financing, even in the profit-and-loss-sharing modes of financing. These facts show how current Islamic banking practices have moved away from the paradigm version. Moreover, the lack of risk assessment techniques for the sharing modes has made most Islamic banks risk averse. They choose non-sharing modes rather than sharing modes in their major investment activities.

The more Islamic banking practice diverges from the 'perfect' paradigm, the more it loses its distinctive features and tends to resemble conventional banking. Lastly, the authors show how the shifting paradigm of Islamic banking practices affects the focus of Islamic banking supervision (see Exhibit 3.9).

and the means and power to conduct both on-and off-site supervision and enforce their decisions. Fourth, it ensures that the financial risks are adequately managed. Finally, it emphasizes close co-operation with other supervisors where the operations of the banks cross national boundaries.
### Exhibit 3.9
Shift in focus of Islamic banking supervision

<table>
<thead>
<tr>
<th>Issue</th>
<th>Paradigm Version of Islamic Banking</th>
<th>Islamic Banking in Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robustness to absorb external shocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Liquidity risk</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>2. Insolvency risk</td>
<td>Less likely</td>
<td>More likely</td>
</tr>
<tr>
<td>3. Information disclosure requirements</td>
<td>Higher</td>
<td>Lower</td>
</tr>
</tbody>
</table>

Relative importance of:

<table>
<thead>
<tr>
<th>Assessment and management of operational risks:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reliance on appropriate procedures and adequate infrastructure</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>2. Reliance on human technical expertise</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Prudential standards</td>
<td>Relevant; to be assessed on a bank-by-bank and country-by country basis</td>
<td>Crucial</td>
</tr>
</tbody>
</table>

Source: Errico and Farahbaksh (1998)

#### 3.3.2. Regulations concerning sharia compliance

Islamic banks should always synchronise their financial activities with the religious guidance, which is outlined in the opinion of jurists on points of law. These opinions are usually called fatwa. These fatwas are issued by individuals or religious bodies, which are established by the governments. A fatwa, as a matter of fact, is a technical interpretation of religious law, which can be used in financial activities and other daily activities. Fatwas may have operational implication for Islamic banks. Islamic banks, for instance, need accounting standards that are in accordance with the fatwas. In 1991, The AAOIFI, which was formerly known as the Financial Accounting Organisation for Islamic Banks and Financial Institutions, was established. The main purpose of its establishment was to review and to develop accounting and auditing standards for Islamic financial institutions that are internationally recognised in order to

---

28 Every Muslim country may still have different sets of fatwa regulating Islamic banks although steps towards convergence are still being pursued.
29 The information which is provided by the accounting standard includes compliance with Islamic rules and social responsibilities, like the allocation of charity funds (zakah funds). Financially, the accounting reports can also be used to ensure the ability of an Islamic bank to cover its financial risks.
assist users of these reports in making decisions. An Islamic bank usually has a sharia supervisory board (SSB) to ensure the accordance of banking products, allocation of investments and banking management with Islamic principles. The SSB provides a report about the level of compliance with sharia rules together with the bank’s annual report.

3.3.3. Regulations concerning financial soundness

A. Islamic banking and the Basle Committee’s core principles for effective banking supervision

The ‘Core Principles for effective banking supervision’ were designed as the first attempt by the Basle Committee to present a comprehensive document on good supervisory practice. The comprehensiveness of the Principles that underpins them makes them applicable equally to industrialised countries, emerging markets and economies in transition. The approach to banking supervision adopted by the Basle Committee represents a response to the rapid evolution of the financial market where the old supervisory techniques have become inadequate as a means of monitoring the performance of a bank. Some qualitative aspects, such as the quality of corporate governance, risk management and internal controls, are now emphasised more in banking supervision.

Islamic banking systems, in fact, are facing a similar situation. The Islamic banking supervisors are mandated to understand about the nature of the Islamic banking business. These regulators can benefit from recent developments of in the western banking supervisory framework. Most of the principles are still relevant to the promotion of best practice in an Islamic banking regulator framework. Through a deep understanding of the nature of the Islamic banking business and the current western banking supervisory framework, Islamic banking regulators will be able to develop a sound banking system without losing its system’s own distinction. In Exhibit 3.10, we
can see the relevance of the core principles for effective banking supervision to best practice in Islamic banking supervision.

Exhibit 3.10
The relevance of the core principles for effective banking supervision outlined by the Basle Committee to Islamic banking supervision

<table>
<thead>
<tr>
<th>Headings of the Core Principles for Effective Banking Supervision</th>
<th>The Relevance of the Principles to Islamic Banking Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Preconditions for effective banking supervision</td>
<td>Islamic banking systems should also have a sound legal framework for banking supervision that ensures the supervisory process can be conducted effectively. Islamic banking systems need other additional supervisory standards i.e. sharia standard.</td>
</tr>
<tr>
<td>2 Licensing and structure</td>
<td>The licensing process can be viewed as the first stage in establishing a sound Islamic banking system. A sound licensing process can prevent the banking system from being crowded by short-sighted players.</td>
</tr>
<tr>
<td>3 Prudential regulations and requirements</td>
<td>Islamic banking operations need different and unsuitable banking regulations and requirements. The prudential regulations and requirements need to adopt some operational differences, such as the redefinition of the capital adequacy requirement since the banks have different capital structures, and a proper measure of the quality of profit-and-loss-sharing assets to assess the risk of the investments. The new approach to Islamic banking regulation should reflect the risk taking capacity of an Islamic bank in order to ensure the sustainability of its operations.</td>
</tr>
<tr>
<td>4 Methods of ongoing banking supervision</td>
<td>The supervisors must ensure that they have the means and powers to gather information, both on- and off-site, and the authority to enforce their decisions.</td>
</tr>
<tr>
<td>5 Information requirements</td>
<td>Information requirements are one of the key factors in Islamic banking operations. The more symmetric the information shared between the market participants, the more it encourages the environment to apply the perfect paradigm of Islamic banking.</td>
</tr>
<tr>
<td>6 Formal powers of supervisors</td>
<td>As part of a sound legal framework, the Islamic banking supervisors should be equipped with adequate power to regulate.</td>
</tr>
<tr>
<td>7 Cross-border banking</td>
<td>In a global financial market, Islamic-banking regulators should think about the compatibility of regulatory setting. Since the Islamic banks are expected to facilitate international trade and businesses, the quality of the banking operations as well as the supervision has to meet international standards.</td>
</tr>
</tbody>
</table>

In practice, the Basle principles for effective banking supervision have been adopted by most Islamic banking regulators, even if those Islamic banking systems have separate
Islamic banking laws (see Exhibit 3.11). In the absence of properly-designed banking regulatory instruments, most Islamic banking regulators adopt the western regulatory standards (such as the CAMEL rating system to measure the level of soundness of banking operations), the Basle capital adequacy standard, sound asset valuation techniques, and other prudential measures. However, there is a need to have a properly designed banking regulation for Islamic banks that accommodates the operational differences. Some technical regulations cannot be directly applied because Islamic banks have different type of nature of contract.

**Exhibit 3.11**

**The adoption of banking standards by Islamic banking regulators**

<table>
<thead>
<tr>
<th>Countries</th>
<th>Types of banking system</th>
<th>The existence of separated Islamic bank law</th>
<th>The existence of national sharia board</th>
<th>Adoption of Basle Accord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>Dual</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Gambia</td>
<td>Dual</td>
<td>Yes</td>
<td>Yes</td>
<td>Not clear</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Dual</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Iran</td>
<td>Single</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Jordan</td>
<td>Dual</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Dual</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Dual</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Dual*</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Qatar</td>
<td>Dual</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Sudan</td>
<td>Single</td>
<td>Yes</td>
<td>Yes</td>
<td>Not clear</td>
</tr>
<tr>
<td>Turkey</td>
<td>Dual</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UAE</td>
<td>Dual</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Yemen</td>
<td>Dual</td>
<td>Yes</td>
<td>Yes</td>
<td>Not clear</td>
</tr>
</tbody>
</table>

Source: Khan and Chapra (2000), compiled

*) The Islamization of the financial system in Pakistan has been postponed

Islamic banks, technically, perform fiduciary and agency roles. A new concept of capital regulation is required to accommodate the differences. Nevertheless, other supporting factors (i.e. sound asset valuation and risk assessment standards, sound market discipline and supervisory review) are still required to strengthen the
supervisory process\textsuperscript{30}. In the presence of sharing-based assets, the supervisors should be fully equipped with appropriate actuarial skills to fairly assess the quality of Islamic banks' assets.

\textbf{Exhibit 3.12}
\textit{A Comparison of early warning systems}

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Western banks</th>
<th>Islamic banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>Objective: to enhance the banks' fiduciary role. The calculation of capital</td>
<td>Objective: to enhance the banks' fiduciary and agency roles. The calculation</td>
</tr>
<tr>
<td></td>
<td>adequacy should be supported by: Sound asset valuation and risk assessment.</td>
<td>of capital adequacy should be supported by: Sound asset valuation and risk</td>
</tr>
<tr>
<td>Asset quality</td>
<td>Asset quality assessments are conducted to ensure operational sustainability</td>
<td>Asset quality assessments are conducted to ensure the operational sustainability (ex ante). In the presence of sharing-based assets, the assessment should be capable of estimating the expected returns.</td>
</tr>
<tr>
<td>Management</td>
<td>The assessment of management quality is conducted to ensure that the bank</td>
<td>The assessment of management quality is conducted to ensure that the bank</td>
</tr>
<tr>
<td></td>
<td>management is qualified to run the business. The emphasis of modern banking</td>
<td>management is qualified to run the business. The emphasis of modern banking</td>
</tr>
<tr>
<td></td>
<td>supervision is to ensure that the bank has a sound financial risk management</td>
<td>supervision is to ensure that the bank has a sound financial risk management</td>
</tr>
<tr>
<td></td>
<td>system.</td>
<td>system. One aspect that is also important for Islamic banks is the knowledge of sharia aspects.</td>
</tr>
<tr>
<td>Earning</td>
<td>The assessment of earning is conducted to evaluate financial performance (ex</td>
<td>The assessment of earning is conducted to evaluate financial performance (ex</td>
</tr>
<tr>
<td></td>
<td>post).</td>
<td>post)</td>
</tr>
<tr>
<td>Liquidity</td>
<td>The assessment of liquidity is conducted to evaluate the capability of prompt</td>
<td>The assessment of liquidity is conducted to evaluate the capability of prompt</td>
</tr>
<tr>
<td></td>
<td>repayment.</td>
<td>repayment.</td>
</tr>
</tbody>
</table>

In Islamic banking operations, the sharia aspects are also important. The regulators should possess appropriate managerial skills and adequate knowledge of the sharia. Although the knowledge of the sharia is not technical, and will not affect the financial

\textsuperscript{30} The second and the third pillars of the new capital accord contained in the Basel Committee's consultative paper issued in April 2001.
performance of the banks directly, compliance with the sharia principles will potentially affect the confidence of religious depositors who want to place their funds in the Islamic banks because of religious motives. Exhibit 3.12 shows a comparison of the partly objectives of early warning system used for Islamic banks and western banks.

The relationship between banks and the monetary authority

The regulation of daily banking operations cannot be separated from the policy for economic development. It was mentioned earlier that the main objective of banking regulation is to assist in the fulfilment of macroeconomic targets. Generally, the relationship between the banking system and the monetary authority contains two elements. First, the monetary authority uses banks as channels through which to control money stock growth in order to achieve monetary objectives using several monetary instruments (such as reserve requirements and open market operation\textsuperscript{31}). Unfortunately, these instruments work through interest bases, which is unacceptable under Islamic financial principles. Thus, the monetary authority cannot use Islamic banks as channels through which it can pursue monetary targets. Secondly, in a severe market liquidity shortage, the central bank acts as a lender of last resort for banks to overcome their liquidity mismatch. This support however, also charging interest rates. Western central banks normally determine higher interest rates in order to encourage banks to manage their liquidity properly. But, Islamic banks cannot use this facility since central banks would not lend to banks without interest-based returns. The absence of a lender of last resort facility may be the main reason why Islamic banks tend to keep higher levels of liquidity. However, some countries, like Malaysia and Indonesia, have been trying to overcome their obstacle by developing some money market instruments for Islamic banks that would enable Islamic banks to interact not only among themselves but also with their central banks.

\textsuperscript{31} Through contraction and expansion mechanism, monetary authority tries to control level of money supply that is considered optimal for economic development. Generally the contraction is achieved by selling treasury bills while the expansion is achieved by buying commercial papers issued by the banks (although the instruments used may differ between countries). The buying and selling activities are conducted through the auctions in the money market.
B. Current development of Islamic banking regulations

One aspect, which currently has got attention by the Islamic banking experts, is the new approach for capital regulation. The existence of Profit Sharing Investment Accounts [PSIA] raises some fundamental issues in calculating the Capital Adequacy Ratio [CAR] for an Islamic bank. The basic issue surrounds the possibility of including PSIA as a component of capital because they have a risk-absorbing capability. In this respect, the AAOIFI's Discussion Memorandum on the Calculation of the Capital Adequacy Ratio for Islamic Banks [issued in January 1998] is relevant. This document tries to design a capital adequacy framework for Islamic banks within the Basel's capital adequacy framework. Following this, the AAOIFI issued the Statement on the Purpose and Calculation of the Capital Adequacy Ratio for Islamic Banks in March 1999. According to this statement, Islamic banks' own capital is exposed to normal commercial risk, fiduciary risk and displaced commercial risk, implying that these types of risk should underlie the design of the capital regulations. It proposes three things. First, that there should be no inclusion of PSIA in the risk bearing capital. Second, that all assets financed by debt-based liabilities and own-capital should be included in the denominator of the CAR. And, third, 50% of PSIA-financed assets should be included in the denominator of the CAR. The last measure is needed to cover possible losses arising from misconduct or negligence in investment activities. Thus:

\[
\text{CAR} = \frac{OC}{W_{OC+L}(OC + L) + W_{PSIA} + (0.5 \times PSIA)}
\]

Displaced commercial risk expresses a possibility that depositors will withdraw their funds if the return given to the depositors is lower than the other banks. Some Islamic banks give minimum guaranteed return to depositors although it is prohibited by the sharia.

The statement does not distinguish between PSIA and PSIA. If the bank management acts in breach of the investment contract, or is guilty of misconduct or negligence in the management of the investors' funds, then the bank may be legally liable in respect of losses sustained on those funds (AAOIFI, 1999).
where OC\textsuperscript{35} is the bank's own capital; L\textsuperscript{36} represents its non-PLS-based deposits; $W_{OC+L}$ represents the average risk weight for assets financed by OC and L; and $W_{PSIA}$ represents the average risk weight for assets financed by PSIA. Like the Basel standards, the AAOIFI standard requires the CAR to be at least 8%.

Khan and Chapra (2000) suggest an adoption of separated capital adequacy standards for demand deposits and investment deposits. They argue that the separation of capital requirements will enhance comparability, transparency, market discipline, depositor protection and systemic stability. Furthermore, they mention the possibility of either keeping the demand deposits in trading book or pooling the investment deposits in the securities subsidiary.

3.4. Current Developments in Islamic Banking

3.4.1. Some evidence for Islamic banking and finance internationally

The Islamic banking industry has been growing rapidly. The industry continues to gain confidence from Muslim society. It is indicated by the growth of the funds under the Islamic banks’ management (Exhibit 3.13). Most investors are located in the Middle East region that accounts for almost 60% of the funds. The Middle East region is also dominant in terms of the individual asset size of the banks (Exhibit 3.14). The level of variability in asset size is given in Exhibit 3.15.

\textsuperscript{35} The Islamic bank's own capital is calculated according to the Basel methodology and comprises two tiers: Tier 1 and Tier 2. This basic calculation has been adopted by the AAOIFI's Financial Accounting Standard (No 11: Provision and Reserves).

\textsuperscript{36} The AAOIFI uses L to include all other (non-PLS-based) deposits. From now we use SA to express all other non-PLS-based deposits.
Exhibit 3.13
Funds under management

<table>
<thead>
<tr>
<th>Years</th>
<th>93</th>
<th>94</th>
<th>95</th>
<th>96</th>
<th>97</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billions of USD</td>
<td>0</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
</tr>
</tbody>
</table>

Sources: Directory of Islamic Banks and Financial Institution (1997)

Exhibit 3.14
 Funds managed by Islamic Institutions by region

<table>
<thead>
<tr>
<th>Region</th>
<th>Funds managed ($ millions)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>South and south east Asia</td>
<td>27,487.7</td>
<td>24.8</td>
</tr>
<tr>
<td>G.C.C. Countries</td>
<td>14,088.5</td>
<td>13.0</td>
</tr>
<tr>
<td>Middle East</td>
<td>69,076.1</td>
<td>59.5</td>
</tr>
<tr>
<td>Africa</td>
<td>730.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Asia</td>
<td>2.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Europe and America</td>
<td>1,139.0</td>
<td>1.4</td>
</tr>
<tr>
<td>Total</td>
<td>112,589.8</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Directory of Islamic Bank and Financial Institutions (1997)

Exhibit 3.15
 Distribution of Islamic banks in terms of asset size and regions

<table>
<thead>
<tr>
<th>Region</th>
<th>South Asia</th>
<th>Africa</th>
<th>South East Asia</th>
<th>Middle East</th>
<th>GCC</th>
<th>USA and Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>801.5</td>
<td>48.9</td>
<td>75.2</td>
<td>2,839.1</td>
<td>1,022.5</td>
<td>146.9</td>
</tr>
<tr>
<td>StDev</td>
<td>1,725.7</td>
<td>49.9</td>
<td>242.1</td>
<td>5,435.7</td>
<td>2,295.0</td>
<td>173.3</td>
</tr>
</tbody>
</table>

(Millions of USD)

Sources: Compiled from the Directory of Islamic Banks and Financial Institution (1997)
Islamic banks in the USA and Europe followed by the G.C.C. countries are the most efficient. This is indicated by a high level of Return on Assets (ROA), as seen in Exhibit 3.16.

Exhibit 3.16
Distribution of Islamic banks in terms of profitability (ROA) and regions

<table>
<thead>
<tr>
<th>Region</th>
<th>South Asia</th>
<th>Africa</th>
<th>South East Asia</th>
<th>Middle East</th>
<th>GCC</th>
<th>USA and Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.36</td>
<td>1.39</td>
<td>1.50</td>
<td>2.43</td>
<td>4.25</td>
<td>11.19</td>
</tr>
<tr>
<td>StDev</td>
<td>4.41</td>
<td>10.35</td>
<td>14.93</td>
<td>4.31</td>
<td>4.94</td>
<td>9.86</td>
</tr>
</tbody>
</table>
(Percentages)
Sources: Compiled from the Directory of Islamic Banks and Financial Institution (1997)

Contemporary Islamic banks are dominated by murabaha or mark-up modes of financing. It is estimated that 70 percent or more of investments by Islamic banks are not on a profit and loss sharing basis (Iqbal (1998)). The general overview about the use of financing in Islamic banks is described in Exhibit 3.17\(^{37}\). However, Dar and Presley (1999) report that, in some countries (Switzerland and Iran), sharing modes of financing are dominant and they earn a higher level of profitability.

Exhibit 3.17
Financing by modes

<table>
<thead>
<tr>
<th>Modes of financing</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murabaha</td>
<td>37</td>
</tr>
<tr>
<td>Musharaka</td>
<td>19</td>
</tr>
<tr>
<td>Mudaraba</td>
<td>6</td>
</tr>
<tr>
<td>Ijara</td>
<td>9</td>
</tr>
<tr>
<td>Others</td>
<td>29</td>
</tr>
</tbody>
</table>
Sources: Compiled from the Directory of Islamic Banks and Financial Institution (1997)
Currently, the financing area of Islamic banks has covered various business sectors, dominated by the trade sector (see Exhibit 3.18).

### Exhibit 3.18
Financing by sectors

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trading</td>
<td>32</td>
</tr>
<tr>
<td>Agricultural</td>
<td>6</td>
</tr>
<tr>
<td>Industry (manufacturing)</td>
<td>17</td>
</tr>
<tr>
<td>Services</td>
<td>12</td>
</tr>
<tr>
<td>Housing and constructions</td>
<td>16</td>
</tr>
<tr>
<td>Others</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Sources: Directory of Islamic Banks and Financial Institution (1997)

3.4.2. The development of Islamic banking in Indonesia

The establishment of the first Islamic financial institution in Egypt in 1963 has had a significant influence on the development of Islamic financial institutions in Indonesia. Since then, many religious scholars have held summits in their efforts to find an alternative intermediary system that is free from interest, thereby, meeting the demands of the Muslim community for an interest free banking system. Almost 80 percent of Indonesia’s 200 million population are Muslim. It is thus evident that there are many people who do not wish to put their money in the interest-based banking system. Therefore, there is a potential hidden supply of resources to be mobilised by the government, in order to optimise savings/investment activities.

The existence of Islamic non-bank financial institutions started well before a formal Islamic legal base came into force. In 1968, an Indonesian Muslim trust company and

---

37 Profit-and-loss sharing-based products consist of Mudaraba and Musharaka (25 percent of total), while non-profit-loss sharing products consist of Murabaha and Ijara (46 percent). The rest 29 percent could be a combination of these two concepts of financing.
an Afro-Asian Islamic business organisation were founded. In 1980, there were attempts to establish an Islamic micro finance scheme called ‘Bait at Tamwil Teknosa-ITB’, which was initiated by a university. In 1983, the two largest Islamic organisations in Indonesia began to operate Islamic rural banks to facilitate financial activities in their communities.

**Exhibit 3.19**
Islamic financial institutions in Indonesia

<table>
<thead>
<tr>
<th>Type of Islamic financial institutions</th>
<th>The number of institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial bank</td>
<td>1 Islamic commercial bank, 6 private owned commercial banks and 3 government owned commercial banks that operate Islamic branches</td>
</tr>
<tr>
<td>Rural bank</td>
<td>78 Islamic rural banks in operation</td>
</tr>
<tr>
<td>Micro-finance house</td>
<td>Approximately 2000 micro-finance houses in rural area</td>
</tr>
<tr>
<td>Insurance company</td>
<td>2 Islamic insurance companies</td>
</tr>
<tr>
<td>Securities company</td>
<td>2 Islamic securities companies</td>
</tr>
</tbody>
</table>

Source: Bank Indonesia, 1999

The first Islamic commercial bank came into operation in 1992. In order to facilitate demands of the Islamic community, the government has recently included Islamic banks as an element in the national banking system in a new banking act. Since the new banking act came into force, there are many banks that have shown their interest in operating Islamic banks. Some of them are interested in converting all their activities onto an Islamic basis and some of them are interested in opening Islamic branches. Today, there are various types of Islamic financial institutions that operate in Indonesia (see Exhibit 3.19).

The Islamic banking system is growing at almost 20% annually, in terms of total assets (within periods of 1992 to 1999), assisted by the stipulations of the banking act and the central bank act which clearly support the development of Islamic banks in Indonesia. The number of branches has also increased (see Exhibit 3.18). The government
promotes a dual banking system that allows conventional banking and Islamic banking to operate side by side.

Exhibit 3.20
(a) Total Assets of Islamic Banks

(b) Total number of offices

Source: Bank Indonesia (1999)

The customers are free to choose which system to use. The government, in turn, is in a position to provide a sound and efficient banking system. Islamic bank supervisors are in a pivotal position to build public confidence through the establishment of a sound Islamic banking system. The current application of Islamic banking concepts is still far from the ‘perfect paradigm’. The application of profit-and-loss sharing has shifted to revenue sharing, in which the capital providers are more risk averse than the capital providers within a profit-and-loss-sharing system. On the liabilities side, all depositors’ funds are placed in savings deposits that are explicitly guaranteed by the shareholders and ultimately by the government (in principal amount)\(^{38}\).

\(^{38}\) Before 1997, there was no such deposit insurance scheme applied in the Indonesian banking system. However, since the banking crisis of 1997, the government has implemented a blanket guarantee to avoid deposit runs. The crisis was triggered by a severe fall in the external value of the Indonesian currency (Rupiah) and was followed by a deterioration of bank assets caused by a severe and long monetary turbulence. Subsequently, there were many banks that became insolvent. Triggered by the liquidation of
The initial move by the Indonesian banking regulator to properly regulate Islamic banks was realised by proposing a new banking act as a legal foundation for the stipulation of further technical regulations. The house of representatives of the Republic of Indonesia has ratified the new banking act, which has effectively come into force on November 10, 1998\textsuperscript{39}. From the elucidation to the Act Number 7 of 1992 concerning banking, as amended by the Act of the Republic of Indonesia Number 10 of 1998, it is stated that:

\begin{quote}
Meanwhile, the role of a Bank which conducts its operations based on sharia principles needs to be increased in order to meet the people's aspirations and needs. This Act provides broader opportunity for the public to establish a Bank which conduct its operation based on sharia principles, including the opportunity for commercial banks to establish a branch office which conducts activities solely based on sharia principles.
\end{quote}

Therefore, the operations of an Islamic commercial bank encompass providing financing and/or conducting other activities based on sharia principles, in accordance with regulations stipulated by the banking supervisory authority\textsuperscript{40}. The new banking act also includes general guidance for sound Islamic-banking practices, such as sound practices for financing activities and financial participation and the existence of Bank Indonesia as the banking supervisory agency. At the moment, the regulator applies the same supervisory framework to western banks and Islamic banks. The only thing different is the recognition of new instruments that are approved religiously\textsuperscript{41}.

The existence of Islamic banks in the monetary system has also been regulated in the new Act concerning the central bank. In the Act of the Republic of Indonesia number 23

\textsuperscript{39} The Act number 7 of 1992 concerning banking, as amended by the Act of the Republic of Indonesia number 10 of 1998.

\textsuperscript{40} Letter m of Article 6 in the Act of the Republic of Indonesia number 7 of 1992 concerning banking, as amended by Act number 10 of 1998.

\textsuperscript{41} The new banking act is incorporated into several technical banking regulations concerning capital, asset quality, liquidity, management etc.
of 1999 concerning Bank Indonesia (central bank), the central bank has also prepared a monetary control system that can be applied to Islamic banks. At the same time, the central bank also operates the task of lender of the last resort on sharia principles to overcome temporary liquidity mismatches in Islamic banks. The interaction with the central bank is important at this moment, especially in the condition where there are just a few Islamic banks involved in the Islamic money market. At the early stage of development where there was only one Islamic bank in existence, interest based inter-bank loans (loaned by conventional banks) was the only choice to overcome temporary liquidity mismatches because the central bank did not have any mechanism for lending to the Islamic bank.

3.5. Summary

Islamic banking is the realisation of a need for religiously-approved financial services by Muslim society. The operations are in accordance with religious rulings that emphasise three fundamental aspects i.e. the prohibition of usury in all forms of transactions, the prevention of gambling/speculative activities, and the restriction of investments to permissible investments (halal). Technically, Islamic banks adopt the approach of western banks in their operations. However, because of the prohibition of usury, Islamic banks collect and place depositors’ funds in different ways. Islamic banks provide three types of deposits, and leave the choice up to the consumer. Each type of deposit requires a different level of commitment for investment. On the assets side, Islamic banks employ profit-and-loss sharing schemes (i.e. mudaraba and musharaka) and non profit-and-loss sharing schemes (i.e. murabaha, ijara and salam).

---

42 Point (2), Article 10, Chapter IV of Act of the Republic of Indonesia Number 23 of 1999 concerning Bank Indonesia. The development of Islamic banking in Indonesia has shown a high growth rate, hence the government considers it important to include Islamic banks in monetary operations.

43 Article 11 Chapter IV Act of the Republic of Indonesia Number 23 of 1999 concerning Bank Indonesia. Before the legal base for Islamic banks came into force, Islamic banks (there was only one Islamic bank in operation) was forced to interact with other conventional banks on an interest basis since there were not any supporting financial instruments established for Islamic banks. However, since the stipulation of the
The desire of the Muslim community to have their own financial system followed by the rapid development of Islamic financial institutions poses challenges for the banking regulatory and supervisory authorities, which are required to establish a sound and efficient Islamic banking system. In practice, Islamic banks are not the only players in the Islamic financial system. There also exist other non-bank financial institutions, such as Islamic insurance companies, and Islamic trust companies. The Islamic banks exist to provide financially sound and religiously-approved financial services. The regulatory framework for Islamic banks should cover financial and religious aspects (sharia compliance), in order to promote a sound Islamic banking system.

Current banking supervisors have used a western banking framework to supervise Islamic banks. In the absence of comprehensive Islamic banking regulations, the Indonesian banking regulator adopts western-style banking regulation to supervise Islamic banks. Although most regulatory concepts are relevant, the regulators should be able to recognise operational differences. First, Islamic banks perform agency role and fiduciary roles at the same time. The regulations adopted should be able to enhance both roles. This highlights the importance of an appropriate capital regulation since an Islamic bank has a different nature of contract to a western bank. There have been attempts to design, partially, appropriate regulations for Islamic banks, including capital regulation. However, the current capital regulation for Islamic banks does not pose sufficient attention to the agency role. Second, the regulations used should ensure sharia compliance. A low level of compliance with the sharia principles may ultimately erode public confidence in the banking system.

The development of Islamic banks internationally has also inspired the development of Islamic banks in Indonesia. The value of the total assets of Islamic banks operating in Indonesia has been growing at almost 20 percent annually in recent years. In order to fulfil the aspirations of the Muslim community, the Indonesian House of Representatives has ratified a new banking system that mentions explicitly the existence
of Islamic banks in the Indonesian banking system. The new banking act can be viewed as a legal foundation for the stipulations of further technical Islamic banking regulations.
Appendix 3.A

Summary of prudential regulations applied to Islamic banks in Indonesia

Capital adequacy requirements

Islamic banks are required to comply with capital regulations that are applied to western banks, including a requirement to maintain a minimum capital ratio equal to four percent of risk weighted assets and rules relating to the determination of core/supplementary element of capital. However, the capital regulation applied has not taken account of other elements that are typically held by Islamic banks that also perform a function like capital, such as investment-based deposits. The Islamic bank supervisors and regulators, in the future, should be able to adopt a different approach without creating excessive moral hazard for the shareholders in conducting fiduciary roles.

Assessment of earning assets quality

Considering a bank’s survival is highly dependent on the readiness of the bank to face the risk of losses arising from the placement of funds, the quality of its earning assets is important. The quality of earning assets is determined by business prospects, financial condition and the repayment capacity of the customers, and is routinely assessed by bank supervisors.

---

44 Referring to the Decree of The Board of Managing Directors of Bank Indonesia Number 31/146/KEP/DIR dated November 12, 1998 Concerning Amendment to Decree of The Board of Managing Directors of Bank Indonesia Number 26/20/KEP/DIR dated November 29, 1993 Concerning the Bank Capital Adequacy Requirement

45 Referring to the Decree of The Board of Managing Directors of Bank Indonesia Number 31/147/KEP/DIR dated November 12, 1998 Concerning Earning Assets Quality

46 The quality of loan will be classified into five general categories: current; special mentioned; substandard; doubtful; and loss. Before the stipulation of the new banking act, the classification of earning assets quality was based on delinquency periods (current, substandard, doubtful and loss for no delinquency, 3 month interest payment arrears, 6 month interest payment arrears and 12 month interest payment arrears respectively). The new regulation for assessing the earning assets quality of the banks will give a chance to a bank supervisor to fairly assess the real asset value of the bank. However, it requires a higher level of skill by the bank supervisors in interpreting other market signals before deciding the loan quality of the banks.
Allowance for earning assets losses

In its operations, a bank has to be able to cover anticipated losses; therefore banks are obliged to establish an allowance for earning assets losses. The allowances for earning asset losses are in the form of general provisions and special provisions. General provisions are less than 1 percent of earning assets classified as 'current'. Special provisions must comprise 5 percent of earning assets classified as 'special mentioned', 15 percent of earning assets classified as 'substandard', 50 percent of earning assets classified as 'doubtful' and 100 percent of earning assets classified as 'loss'.

Annual financial statements and published financial statement for commercial banks

Bank financial statements are important sources of information for the public concerned with evaluating bank performance. Therefore, it is necessary for banks to prepare more transparent financial statements that will strengthen the social control function of the public in respect of banking institutions. The annual financial statement should include a balance sheet, a statement of commitments and contingencies, an income statement and retained-earnings statement, a cash flow statement, notes to the financial statement, and details on credit to connected parties, earning assets quality, allowances set aside for earning assets losses and the capital adequacy ratio. Published financial statements should include details on the balance sheet, the statement of commitment and contingencies, the income and retained earnings statement, and other information relating to the composition of shareholders, the composition of management, credit to connected parties, earning assets quality, allowances for earning asset losses and the capital adequacy ratio.

47 Referring to the Decree of The Board of Managing Directors of Bank Indonesia Number 31/148/KEP/DJR dated November 12, 1998 Concerning Allowance for Earning Assets Losses
48 Referring to the Decree of The Board of Managing Directors of Bank Indonesia Number 31/176/KEP/DJR dated December 31, 1998 Concerning Annual Financial Statements and Published Financial Statements for Commercial Banks
**Legal lending limit for commercial banks**

Lending which is beyond a 'reasonable' limit to individual borrowers or groups of debtors, whether connected parties or non-connected parties to a bank, is commonly one of the major causes of bank failure. In order to avoid such business failure as a consequence of concentrated lending it is necessary that banks seriously apply prudential principles in their lending activities by diversifying their credit portfolios. The legal lending limit for an individual debtor or group of debtors comprising a non-connected party shall not be more than 20 percent of capital, whilst the legal lending limit for a connected party, whether an individual debtor or a group of debtors, shall not exceed 10 percent of capital.

**Net open position for commercial banks**

The emergence of new instruments in parallel with the growth of the foreign exchange market has given rise to increased risks for banks. In the light of this increased risk, it is deemed necessary for banks to apply prudential principles in a more appropriate manner for the management of foreign exchange funds. Each bank shall maintain its net open position at the close of each business day at not more than 20 percent of capital that is calculated on a consolidated basis for all domestic and overseas branch offices. The net open position is defined as the absolute value of the sum of net difference between assets and liabilities in all foreign currencies recorded on the balance sheet.

**Liquidity monitoring for commercial banks**

In order to safeguard the continuity of banking operations and uphold public confidence, it is necessary for banks to maintain adequate liquidity for the settlement of liabilities. Management of liquidity that complies with prudential principles through the use of a proper liquidity monitoring system is important if the bank is to handle any

---

49 Referring to the Decree of The Board of Managing Directors of Bank Indonesia Number 31/177/KEP/DIR dated December 31, 1998 Concerning Legal Lending Limit for Commercial Banks
50 Referring to the Decree of The Board of Managing Directors of Bank Indonesia Number 31/178/KEP/DIR dated December 31, 1998 Concerning Net Open Position for Commercial Bank
51 Referring to the Decree of The Board of Managing Directors of Bank Indonesia Number 31/179/KEP/DIR dated December 31, 1998 Concerning Liquidity Monitoring for Commercial Banks
liquidity difficulties that may arise. Liquidity monitoring reports requested consist of 
cash flow projections and maturity profiles. Cash flow projection statements consist of a 
statement of projected cash flow for 3 months into the future, comprising assets and 
liabilities in on-balance sheet accounts and claims and liabilities in off-balance sheet 
accounts. Maturity profile statements consist of a statement of the profile of assets and 
liabilities in on-balance sheet accounts that will mature in the future. These reports shall 
be reported in consolidated form, both in rupiah and foreign currencies.
CHAPTER 4
PROFIT AND LOSS SHARING CONTRACTS:
CONCEPTS AND APPLICATIONS

4.1. Introduction

The prohibition of usury creates technical problems for the basis of transactions in Islamic finance. Vogel and Hayes (1996) state that the participation of depositors in Islamic financial institutions is basically founded on non-interest based partnerships. For that reason, the partnership has to rely on the following two principles:

- Return on the capital depends on the profit gained instead of being fixed in advance.
- Capital (including depositors' funds) is directly subject to financial risk since both profits and losses affect the net asset value (NAV) of Islamic banks. The NAV of the bank reflects the growth or deterioration in asset value during a period as a result of the operation of the business.

On the basis of these operational differences, Islamic economists have long been trying to formulate an appropriate form of operation for Islamic intermediary institutions. In 1955, a notion of 'two-tier mudaraba' as the model for Islamic financial institutions was firstly developed as an alternative for Islamic communities to fulfil their needs for financial investment instead of using interest-based systems (see Exhibit 4.1).

In the early concept of two-tier mudaraba, depositors of Islamic banks were treated as investors who are exposed to financial risks. Depositors are exposed to loss (proportional with the owners' equity) since the depositors' funds are placed on a profit-and-loss sharing agreement and the terms of the contract are fixed. The early implementation of PLS in the Islamic financial institutions left several problems to be addressed. First, this type of financial arrangement creates uncertainty for depositors
since they will receive uncertain returns or may even face a loss; yet not all depositors in the Islamic community are willing to take risks. Besides, there is a possibility of facing agency problems caused by asymmetric information that makes depositors vulnerable to 'unnecessary losses'. Second, depositors’ funds are considered as participation in investments. Thus, depositors have less flexibility in using their funds because funds withdrawal depends on the period of the projects financed. Third, in the application of the two-tier mudaraba concept, Islamic banks are obliged to provide a stable, secure and competitive return to depositors. Banks realistically fear that any losses experienced would cause bank-runs, which obviously would have a serious effect, not only on mudarib as a borrower but also on the depositors. Such an event is thought likely to discredit other Islamic financial institutions as well as destroying public confidence.

Exhibit 4.1
Two-tier mudaraba

<table>
<thead>
<tr>
<th>First Tier Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital provided by depositors of Islamic financial institution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Tier Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital provided by banks to finance a particular project or other business to an entrepreneur</td>
</tr>
</tbody>
</table>

| Project |

Source: Vogel and Hayes (1996)

In order to overcome these problems, Islamic banks have introduced various kinds of products to meet the customers’ needs. Some products apply pure PLS/revenue sharing concepts while others are hybrid (a combination of PLS/revenue sharing and fixed claims) and mark-up types of contracts. On the assets side, Islamic banks have also introduced mixed-typed of products. Every country, in fact, adopts a different approach to implementing the PLS concept depending on the confidence and the readiness of
society to fully apply the concept. The Indonesian Muslim society, for example, does not apply a pure profit-loss-sharing concept. On the liabilities side, all depositors’ funds are based on savings accounts, which do not apply a PLS concept. All depositors’ funds are also covered by the national deposit insurance scheme. The rewards for depositors are based on revenue sharing instead of PLS; hence, Islamic bank depositors are risk averse. On the assets side, more than 95 percent of the banks’ assets are invested in non-PLS contracts, although the portion of PLS-based assets is increasing. Therefore, the operations of Islamic banks still resemble conventional banking operations but with some modifications.

This chapter tries to review analytically the contract choices made based on different risk-preferences and the religious preference of the contracting parties, and also informational availability.

4.2. Types of Contracts in Principal-agent analysis

4.2.1. The choice of contract and the risk aversion level

Baldwin (1998) reviews a sharing contract from the individual’s point of view. Individual rationality is the basic requirement for the existence of an economic transaction. Rationally, a person will engage in a business contract if and only if the expected return of the contract is higher than his minimum utility reservation. The minimum utility reservation in economic transactions is assumed to be in the form of minimum expected monetary income. The individual’s rationality is derived from the

---

1 Dar and Presley (1998) provide a number of explanations for the failure of Islamic financial institutions to use PLS modes of finance (on the assets side). First, PLS modes of finance are considered vulnerable to agency problems since the bank is not able to observe the actual efforts performed by the borrowers. Second, in order to be used efficiently, PLS requires well-defined property rights. Third, especially in a dual banking system, Islamic banks have to compete with conventional banks that are already well established and mostly offer competitive products. Fourth, non-participatory partnerships performed by the bank. Fifth, PLS is not feasible for short-term financing. Sixth, an unfair tax treatment is considered to be an obstacle in applying PLS modes of finance. Seventh, the absence of secondary markets for PLS has led to inefficiency in funds mobilization. And finally, over-regulation of Islamic banks in some countries has also restricted their portfolios to fixed-return assets.
principle of sub-game perfect Nash equilibrium (i.e. the profit share for the agent will give the principal a minimum utility reservation and the profit share for the principal will give the agent a minimum utility reservation)\(^2\). By using the Kuhn-Tucker theorem for analyzing the complimentary slackness in the optimization program, he proves that the profit and loss sharing principles fulfil the condition of strong individual rationality and Pareto optimality. The optimum share ratios for both parties are 
\[ z_a = \beta(E - d_a - d_p) \] for the agent, and 
\[ z_p = (1 - \beta)(E - d_a - d_p) \] for the principal, where \((E - d_a - d_p)\) is a share base and \(\beta\) is a share coefficient of a PLS contract. The sharing coefficient is derived after fulfilling the minimum expected monetary surplus required by the principal and the agent as risk premium.

Besides the risk preference, the level of asymmetric information between the contracting parties is very important in determining the type of contract used. Presley and Sessions (1994) propose a comparative model looking at debt-based contracts and profit-loss-sharing based contracts. The discussion compares the utility maximisation process under a symmetric and an asymmetric information condition in which a second best solution may only be expected. A PLS contract leaves freedom for an agent to exert effort directly since the effort affects the relationship between capital investment and the outcome of the project. Since the agent is free to choose the optimal level of effort, a profit-sharing contract is able to control the agent by designing a contract with the right incentive compatibility constraint; hence, a better outcome for the project may be expected.

\(^2\) The individual’s rationality is achieved when the monetary results gives the utilities to the contracting parties higher than their minimum utility reservations i.e. \(x_a \geq d_a\) and \(x_p \geq d_p\). The relationship between \(x_a\) and \(x_p\) is given by 
\[ x_p = \psi(x_a) = E - x_a, \] where E is a share base. The sub-game perfect Nash equilibrium is fulfilled if the profit share for the agent satisfies the minimum utility reservation of the principal and vice versa (mathematically, it is expressed by 
\[ d_p = \psi(x_a^0) \] and \( x_p = \psi(d_p^0) \). By using the theorem of Eichberger (1993), Baldwin (1998) derives the optimal solution for PLS contract as follows:

\[
f(X, d) = \arg \max \left\{ (x_a - d_a)^\theta (x_p - d_p)^{1-\theta} \mid x_p \leq E - x_a, x_a > d_a, x_p > d_p \right\}
\]
In a contract, each contracting party will always try to maximise their personal interest. A decision or action taken by one party will be a constraint for the other party. Hence, each party tries to maximise their utility subject to constraints imposed by other contracting parties. The contracting parties (a principal and an agent) bargain with each other in order to obtain the optimal sharing ratio (see Exhibit 4.2).

Exhibit 4.2
The sharing coefficient and the return expected by the bank

The principal and the agent will use any information possible to predict the expected cash inflow generated from the project. Based on the expected cash inflow of the project and the expected monetary return, the contracting parties will determine the sharing ratio. A lower expected cash inflow (because of either the poor performance of the industry or a lower level of capability by the entrepreneur) will lead the bank to increase the sharing ratio in its favour since the banks usually have their own internal rate of return to achieve. This process also shows how information plays a very important role in supporting fair sharing agreements.

---

3 There have been many articles about principal agent optimization programs such as those by Holmstrom (1979), Macho-Ines and Peres-Castrillo (1997).
Let us define a utility function of a principal as:

\[ U_p = \max_{[e,x]} \int_{x}^{\bar{x}} U_p(x - s(x)) f(x, e) \, dx \]  \hspace{1cm} (4.1)\]

where, \( x, e, s(x), \) and \( f(x, e) \) represent a monetary output of the contract \( x \in [x, \bar{x}] \), level of effort by the agent, agent’s share of the monetary output and a density function of expected outcomes (via the relationship \( x : f(\text{uncertainty and effort}) \)) respectively. Let us define a utility function of an agent as:

\[ \int_{x}^{\bar{x}} U_a(s(x)) f(x, e) \, dx - V(e) > U_a \]  \hspace{1cm} (4.2)\]

The principal is naturally concerned with the result received and the profit share (pay-off) paid to the agent \((s(x))\). The principal’s utility function expresses his preferences or objective to obtain the greatest possible profit as represented by \( U_p(x - s(x)) \). The principal maximizes his monetary surplus that he might have under the restriction that the agent is willing to accept the contract. The restriction for the agent means that he must have bigger expected pay-off than his minimum requirement \((U)\). Minimum pay-off requirements include operating costs and minimal expected return for the principal. \( V(e) \) represents the agent’s opportunity cost that should be paid when the agent allocates his time to manage the project shared. Hence, the principal takes an action or decision under the agent’s restrictions. The participation condition between the contracting parties is given by:

\[ \lambda = \frac{U_p(x - s(x))}{U_a(s(x))} \]  \hspace{1cm} (4.3)\]
In the first case, we assume that the principal is risk-averse, while the agent is risk-neutral; hence,

$$U_p(x - s^0(x)) = C,$$  
where $C$ is a constant

$$x - s^0(x) = U_p^{-1}(C) \text{ or } s^0(x) = x - U_p^{-1}(C)$$  \(4.4\)

The equation (4.4) shows the preference of risk-averse principal, who like fixed return contract better than variable return contracts. The shared output for the agent represents the variability of the output, whilst the principal enjoys a constant monetary output. This means the agent is fully responsible for the fixed amount of monetary return to the principal ($U_p^{-1}(C)$).

**Exhibit 4.3**
Edgeworth box of risk-averse investors and risk neutral fund user

The bargaining process between the investors and the borrowers can also be analyzed graphically in an Edgeworth box (Exhibit 4.3). The 45° lines from $O_P$ and $O_A$ express the highest level of certainty from the principal and the agent points of views. $w_1$ and
$w_2$ represent monetary output shared to the agent in the two possible different conditions 1 and 2. The risk neutrality of the agent is described in a straight-line utility curve that is tangential to the principal’s utility curve at a point that has the same slope.

In the second case, we assume that the contracting parties both have certain levels of risk aversion. In Macho-Ines and Peres-Castrillo (1997), an optimal sharing ratio between two parties that have certain levels of risk aversions is expressed in a linear form of the optimal contract. The relationship between those two parties is given by:

$$s^o(x) = c + bx,$$  \hspace{1cm} (4.5)

where $b = \frac{r_p}{r_p + r_a}$ and $\frac{U_p'}{U_p} = r_p$ is defined as the principal’s measure of absolute risk aversion while $\frac{U_a'}{U_a} = r_a$ is defined as the agent’s measure of absolute risk aversion. The equation (4.5) is obtained as a result of the optimization process of the utility functions of the contracting parties. Those functions are optimized with respect to $(s(x))$ and the Kuhn Tucker first order condition of the optimal sharing rule with respect to $x$. The result of the sharing agreement depends on the level of confidence of the contracting parties in expecting the future results. In this case the two contracting parties share a proportional level of financial uncertainty. The more risk averse the one party, the lower the sharing ratio required. The implementation of a hybrid contract is a good example explaining this concept. Although the investors in Islamic economics are always encouraged to have a low level of risk aversion in a contract, they still need a level of certainty (at least the principal) guaranteed. Exhibit 4.4 shows the optimal sharing ratio between risk-averse types of contracting parties. The more risk aversion one party (illustrated by a more concave utility curve) the closer the point of tangency to him.

---

4 They use the term ‘absolute risk aversion’ as defined by Arrow (1960).
Islamic teaching, in fact, encourages the contracting parties to share the financial risk (to lower the level of risk aversion). However, the current practice of Islamic banking and the pure concept can be seen as a paradox. This contradiction can be explained in some ways. Islamic teaching also (in some verses) mentions some preconditions to achieve the optimality of the contract that include: trustworthiness (symmetric information) which is supported by a sound accounting system, hardworking behaviour (effort sensitive). Unfortunately, some of those preconditions are unavailable in most developing countries. The lack of adequate infrastructure and information technology has made the system inefficient. These conditions will ultimately build up risk-averse preference by capital holders although, to some extent, they still want to comply with religious rules. This situation is reflected by the domination of non-PLS based products although, to some extent, the sharing concept is still adopted. The next section reviews the possible contractual problems that may potentially arise in the Islamic banking activities.
4.2.2. Possible contractual problems

In a sharing contract, the uncertainty of the outcome comes from not only the production activities but also from the contract itself. The investors face informational imperfection in achieving bargaining solutions, since the investors (depositors) and the banks share different levels of information. The banks and the borrowers (entrepreneurs) also share different levels of information. The increased level of uncertainty may increase the level of risk aversion; hence, the contracting parties (investors) may increase their minimum utility reservations (payment-floor).

In this section, the discussion will be focused on the informational problems that may result in increasing the level of uncertainty in the contract. The informational problems discussed include unobservable effort and hidden productivity. Other possible problems discussed are the lack of accounting system and possible price parity in a dual banking system.

A. Unobservable effort

Moral hazard is a familiar situation in which the principal and agent face a conflict of interest. The moral hazard problem arises when the principal is unable to observe the effort of the agent or even if he can, it is not verifiable, hence it is not contractible. On the other hand, the principal receives private information after the realisation of the contract. Therefore, the pay-off of the agent does not depend on effort. In practice, asymmetric information affects the optimisation process. The moral hazard will potentially arise after the contract has been signed. There is asymmetric information relating to effort performed by the agent during the contract period. The fundamental point of the moral hazard problem is that the agent chooses the effort he will exert that gives the optimal benefit for him (the higher the effort, the higher the cost to the agent).

---

5 See also Holmstrom (1979), Shavel (1983) and Haris and Raviv (1983).
Recalling equation (4.2), optimisation by the agent is represented by
\[ \hat{e} \in \arg \max_{\hat{e}} \left\{ \int_{\xi} U_a(s(x)) f(x, \hat{e}) \, dx - V(\hat{e}) \right\}. \]

In the case of an investor-borrower relationship, the borrower will seek to maximise his monetary return while giving the lowest level of effort. After the contract is signed, there is a possibility of the borrower (entrepreneur) engaging in a prospectively more profitable project. The investor still expects the borrower to allocate most of his time to this project, while the borrower will look at the expected return of the other project as an opportunity loss. The more prospective/profitable the project, the higher the opportunity cost for the borrower since he has to allocate his limited time to manage the less prospective/profitable project. The investor will only know the effort given by the borrower after the project has been realised.

Exhibit 4.5
Moral hazard in profit and loss sharing

In Exhibit 4.5, illustratively, one can see the utility function of the principal \((x - s(x)) f(x, e)\) where \(x \in [\underline{x}, \bar{x}]\). The principal expects the agent to exert the highest

122
possible effort to obtain the highest outcome possible. $f(x,e)$ expresses the existence of diminishing rate of return of the production function where $f_x(x,e) \geq 0$ and $f_{ee}(x,e) < 0$. As mentioned earlier, the utility function of the agent is constrained by the opportunity cost $V(e)$ where $V'(e) > 0$ and $V''(e) \geq 0$. Thus the agent’s utility function will be $(s(x)f(x,e) - V(e))$. Different concavities between the production function and opportunity cost function result in effort optimisation by the agent. The agent will choose the most optimal level of effort ($e^0$) that can give him the maximum utility from the contract.

The analysis above infer that the optimal level of effort chosen by the agent depend upon the production function and the opportunity cost (the possibility of allocating his time anywhere else to get a higher monetary return in aggregate). Poor quality of contract may also create wrong incentive to the agent to ‘abandon’ the project contracted.

Baldwin (2000) reviews the possibility of applying a bonus scheme to induce the agent to supply a higher level of effort that will ultimately give mutual benefit to the contracting parties. The analysis exposes the importance of specifying the precise degree of risk aversion when technology considerations and too low a performance target preclude the use of a dichotomous incentive contract for risk neutral agents, in which the linear profit sharing ratio is contingent on the outcome.

B. Hidden productivity (adverse selection problem)

Another type of informational problem, possibly faced, is an adverse selection problem. Very often, the principal and the agent do not have all the relevant information about each other. The principal never has a complete set of information explaining the condition of the agent as well as the project. The adverse selection problem exists when the agent has information that the principal has not, while that typical information is
very relevant and important in estimating the ‘true’ value of the project and, finally, the fair sharing coefficient. In such condition, the agent will try to exploit informational rent\(^6\).

Before the contract is signed, the contracting parties will have different opinion about the project. Naturally, the principal will propose the lowest value possible so that he will have the highest sharing index possible for him. The agent, on the other hand, will propose the highest value possible so that he will have the highest sharing index possible for him. There have been many paper discussing the possible adverse selection problems in different types of contracts including insurance industry and project financing\(^7\).

Investors (investment depositor on the liabilities side and Islamic banks in the assets side) are facing adverse selection problems. One possible step to reduce the asymmetric information is to choose market indexes as benchmarks. In a more symmetric information condition, the principal will be able to distinguish agent types. For example, the launching of market indexes of industrial performance will help Islamic banks to judge whether a borrower is under performed as compared to the average financial performance in the similar industry.

C. Poor accounting standard

Accounting standard is one of factors in the PLS contract. The major issues are about revenues and costs recognition since this standard will finally determine the profit

---

\(^6\) Macho-Ines and Peres-Castrillo (1997) formulise the typical problem as follows. The principal is maximising her expected profit subject to the restrictions that the agents would decide to engage in the contract. In this case, the principal will face two possible different types of agents: good (G) and bad (B). The most efficient agent will not want to pass himself off as some other type. The optimal contract must be such that greater effort is demanded of the most efficient agent. The objective of the contract is to maximise the utility in facing those two different types of agents (with the probability of having good-type agent and of having bad-type agent).

\(^7\) Akerlof (1970) pioneered a discussion of adverse selection problems as expressed in the market for lemon discussion. Other important reviews about adverse selection can also be found in Mirlees (1974), Spence (1974) and Guesnerie and Laffont (1984).
shared. Standardisation of accounting system may help to prevent disputes between the contracting parties. The level of accounting standardisation will determine the confidence level of the contracting parties to implement PLS contract; otherwise, they choose revenue sharing contract. For example, the use of revenue sharing contract, instead of profit-loss-sharing contract, may reduce uncertainty while having the same expected return. In the PLS scheme, monetary surplus is distributed after subtracting the costs spent in the business. In the revenue sharing scheme, monetary surplus is distributed before subtracting the costs. The income of the principal depends only on the realisation of the state of nature. On the other hand, the agent has to be responsible for the monetary cost he spends besides the realisation of the state of nature. The payment schedules for both schemes (PLS and revenue sharing) are described in Exhibit 4.6.

**Exhibit 4.6**

*Payment schedule for profit and revenue sharing*

<table>
<thead>
<tr>
<th>Profit sharing</th>
<th>Revenue sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent Principal</td>
<td>Agent Principal</td>
</tr>
<tr>
<td>Gross revenue</td>
<td>X</td>
</tr>
<tr>
<td>Cost</td>
<td>C</td>
</tr>
<tr>
<td>Sharing coefficient</td>
<td>α</td>
</tr>
<tr>
<td>Monetary sharing</td>
<td>α(X-C)</td>
</tr>
</tbody>
</table>

The principal and the agent will bargain, so that, the expected return from PLS contract is the same as the return from a revenue-sharing contract. The relation between the revenue-sharing \(E[\pi_{RS}]\) and PLS ratio \(E[\pi_{PLS}]\) (assuming the same expected return) is given by:

\[
E[\pi_{RS}] = E[\pi_{PLS}] \text{; hence,}
\]

\[
\alpha(E[x] - C) = \beta E[x]
\]

\[
\beta = \alpha \left[ 1 - \frac{E[C]}{E[R]} \right] \quad (4.6)
\]
where $\alpha$ and $\beta$ represent share coefficients for PLS and revenue-sharing. $R$ and $C$ represent revenue earned from and cost spent for the project shared. The variances for the PLS and revenue sharing are given as follows:

\[
Var[\pi_{PLS}] = Var[C] + Var[R] + Cov[C, R]
\]

\[
Var[\pi_{PLS}] = Var[\pi_{RS}] + [Var[R] + Cov[C, R]]
\]

Since $Var[C] > 0$ and $Cov[C, R] \geq 0$, then $Var[\pi_{PLS}] > Var[\pi_{RS}]$ (4.7)

Risk-averse investor will like revenue sharing schemes better than PLS scheme since the revenue sharing schemes can reduce the risk while having the same expected profit.

The share base in a sharing contract can vary. In practice, deductibility of capital cost from the share base can be optional in a sharing contract. Baldwin (2000) analyses (analytically) the motivation for using the deductibility of capital cost from the share base, which leads to conclusions. First, non-deductibility of the capital cost from the share base has precluded the attainment of Pareto efficiency by linear sharing contracts when the expected utilities of the agent and investor are both maximised by the same investment decision. Second, when the cost of capital is not deductible from the share base and the agent chooses the investment decision, then there exist a problem of over investment from view point of a risk neutral investor.

In the condition where the cost is also a function of effort, the agent will be able to increase his utility by the increasing the effort level until it reaches the maximum point. Due to the asymmetric information problem, which may be worsened by the lack of standardisation of the accounting system, the contracting parties often do not agree with each other about the fair classification of the costs. In this condition, the principal will prefer having monetary surplus prior to the actual realisation of the business (i.e. revenue sharing) to having a profit and loss sharing scheme. This type of informational problem can be described in a mathematical model below. The cost spent by the agent is
CHAPTER 4 PLS CONTRACT: CONCEPTS AND APPLICATIONS

not invariant to the effort. Sometimes, the agent takes benefits on the effort delivered. The optimisation process of the contract will be:

\[
\max_{e, x} \int_{x}^{\infty} U_a(x - s(x) - C(e)) f(x, e) dx
\]

subject to \( \int_{x}^{\infty} U_a(s(x) + C(e)) f(x, e) dx - V(e) > U \)

\[
\hat{e} \in \arg \max_{\hat{e}} \left\{ \int_{x}^{\hat{e}} U_a(x + C(e)) f(x, \hat{e}) dx - V(\hat{e}) \right\}
\]

Maximizing the agent’s incentive compatibility constraint with respect to \( e \), we have:

\[
U_a(s(x) + C(e)) + \frac{f(x, e)}{f_e(x, e)} C'(e) U'_a(s(x) + C(e)) = \frac{V'(e)}{f_e(x, e)}
\]

(4.9)

Holding the sufficient condition that \( \frac{f(x, e)}{f_e(x, e)} > 0 \), \( C'(e) > 0 \), and \( U'_a(s(x) + C(e)) > 0 \), those conditions tell us that the agent has an incentive to always increase the cost in order to increase his utility, whilst the principal suffers from the excessive effort delivered by the agent.

In such a condition, the principal seems not to have a better choice than to require that the agent to engage in a revenue sharing scheme i.e. the principal is risk averse. As shown in Exhibit 4.7, it can be seen that the agent may receive a higher monetary surplus if he exerts a higher level of effort from \( e^0 \) to \( e' \). He may receive monetary surplus \((s(x(e)) - V(e))\) for PLS and \((s(x(e)) - V(e))'\) revenue sharing respectively. On the contrary, the principal may receive a lower level of monetary utility since his monetary surplus is deducted by costs as a result of a higher level of effort.
Exhibit 4.7
Different intensity of moral hazard in profit sharing when cost is invariant to effort

\[ U(x, e) \]

\[ (x(e) - s(x(e))) \]

\[ (s(x(e)) - V(e)) \]

D. Price parity in a dual banking system

In practice, an entrepreneur has the freedom to choose the most preferable types of contracts, either PLS or fixed-return. In the case of long-term business financing, the religious-driven entrepreneurs will choose sharing-modes of financing for religious reasons whilst common entrepreneurs will choose either variable return or fixed return funding for purely economic reasons (i.e. to minimise the cost of capital). In a dual banking system, any borrower can determine the most economical financing scheme whether it is PLS or fixed return. Islamic banks thus face an adverse selection problem.

For a closer look at this potential problem, let \( x_{pls} \) and \( x_{fr} \) be the returns to the profit-loss sharing mode and fixed return modes for the entrepreneur respectively. The return on the PLS mode depends on the wage \( (w) \), the PLS coefficient \( (\alpha) \), and the return on investment \( (\pi) \).

\[ \text{See Mirlees (1976) for proof.} \]
While the return for the fixed return mode depends on the return of investment \( (\pi) \), the interest rate \( (i) \) and the size of the loan \( (L) \).

\[
x_{\text{fix}} = \pi - iL
\]

Under this option, common entrepreneurs will self-select to the mode of financing that gives the optimum return for their investments.

\[
\text{Max } x_{\text{arb}} = |x_{\text{pls}} - x_{\text{fix}}| \quad (4.10)
\]

If the PLS mode gives the entrepreneur a higher probability of return than the fixed return, naturally he chooses the PLS mode to finance his investments.

\[
x_{\text{pls}} - x_{\text{fix}} \geq 0
\]
\[
w + iL \geq (1 - \alpha)\pi \quad (4.11)
\]

From the last inequality, it is shown that entrepreneurs will self-select the PLS mode in the case where the expected profit of the investment is marginal. On the other hand, if the fixed income mode gives the entrepreneur a probability of higher return, he chooses the fixed return mode to finance his investments.

\[
x_{\text{pls}} - x_{\text{fix}} < 0
\]
\[
w + iL < (1 - \alpha)\pi \quad (4.12)
\]

From the inequality, it is shown that entrepreneurs will self-select the fixed income mode in the case where the interest rate is low, wage level is low or the expected profit
of the investment is high. Dar, Harvey and Presley (1998) relate size and profitability of a project to the contract choices by entrepreneur and capital providers\(^9\).

**Exhibit 4.8**

**Profitability and contractual choice**

<table>
<thead>
<tr>
<th>Profitability</th>
<th>Capitalist</th>
<th>Entrepreneur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low</td>
<td>Fixed return contracts</td>
<td>-</td>
</tr>
<tr>
<td>Medium</td>
<td>PLS contract</td>
<td>PLS contract</td>
</tr>
<tr>
<td>Very high</td>
<td>No contract</td>
<td>Fixed return contract</td>
</tr>
</tbody>
</table>


Exhibit 4.8 shows the relationship between contractual choice and the level of the profitability of the project financed. The table implies that a profit-loss-sharing contract is preferable only for moderately profitable projects. Exhibit 4.9 shows the relationship between the contractual choice with respect to profitability and size of the projects. The table implies that a profit-loss-sharing contract is attractive for small to medium sized projects.

**Exhibit 4.9**

**Project size and contractual choice**

<table>
<thead>
<tr>
<th>Project Size</th>
<th>Capitalist</th>
<th>Entrepreneur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low</td>
<td>PLS contract</td>
<td>PLS contract</td>
</tr>
<tr>
<td>Medium</td>
<td>PLS contract</td>
<td>PLS contract</td>
</tr>
<tr>
<td>Very high</td>
<td>No contract</td>
<td>Fixed return contract</td>
</tr>
</tbody>
</table>


\(^9\) They model a basic income model as a function of fixed salary, an incentive function, and the profits of the project. In the PLS contract, it is assumed that the income of the agents comprises fixed salary and a profit share. Maximisation of the basic income function with respect to the level of investment gives the
4.3. Religious Preferences and the Optimality of Contracts

**Religious utility**

Conceptually, Muslims should have multidimensional types of utilities, where the monetary utility (*al-maal*) is not the only aspect to be achieved. The economic decision is made as a result of an optimisation process rather than just maximising of one important aspect. The concept of sharing is among the aspects, which are preferred or more highly recommended from the religious point of view. Muslims believe that the implementation of the sharing concept may foster the sense of brotherhood in facing future business uncertainty. Therefore, a higher portion of one’s wealth being shared can be associated with a higher level of religious compliance. The higher level of religious compliance will bring a higher utility. However, the significance still depends upon the economic agent’s religious sensitivity. Let us assume that religious utility is a function of religious compliance (*R*), which is characterised in (4.13).

\[
U = f(R) ;
\]

\[
U'(R) \geq 0 ;
\]  

(4.13)

The inequality of the first derivation of the utility function shows the variety of religious preferences among Muslims. The non-religious sensitive Muslim will have \( U'(R) = 0 \); i.e. he will not earn a higher level of utility as a result of a higher level of religious compliance.

**Level of sharing and the expected return**

As reviewed in the previous section, the expected return resulting from a sharing contract depends upon many determining factors. These factors include the availability of information, the preferences of the agent and the application of minimum standards for accounting in the business. A principal may expect a lower level of return in the output elasticity function that indicates the choice of contract parameters that depends on size and profitability.
absence of minimum credible information when involved in the sharing contract. Exhibit 4.10 examines the possible reason for expected returns in share contracts.

Exhibit 4.10
Possible reasons for lower expected returns in share contracts

<table>
<thead>
<tr>
<th>Areas of weakness</th>
<th>Sources of disincentives</th>
<th>Possible result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower level of information available</td>
<td>Higher level of informational rent available to the agent in determining the share index</td>
<td>A lower expected return</td>
</tr>
<tr>
<td>Lower level of trustworthiness for</td>
<td>Higher level of agency cost to abandon the project when the agent finds a prospectively</td>
<td>A lower expected return</td>
</tr>
<tr>
<td>conducting the business</td>
<td>more profitable project</td>
<td></td>
</tr>
<tr>
<td>Lower level of accounting standard</td>
<td>A higher possibility of having financial disputes over the recognition of revenues and costs</td>
<td>A lower expected return</td>
</tr>
</tbody>
</table>

In an adverse condition, a higher portion of sharing in a financial contract may be negatively correlated with the financial outcome. To support this argument, let assume that the business condition affects the probability density function of the productivity function as illustrated in Exhibit 4.11.

Exhibit 4.11
The probability function for two different conditions

\[
\begin{align*}
    f(x) & \quad f_A(x) \\
    f_B(x) & \quad 0
\end{align*}
\]
Chapter 4: PLS Contract: Concepts and Applications

\( f_A(x) \) and \( f_B(x) \) represent optimistic and pessimistic business environments. Those two different projects have possibilities of generating positive as well as negative returns \( (x \in [x, \bar{x}], x < 0 \text{ and } \bar{x} > 0) \). Let assume that \( f_A(x) \) is stochastic-dominant over \( f_B(x) \) (First Stochastic Dominant (FDC))\(^{10}\). Mathematically, this property can be expressed as follows: \( F_A(x) \geq F_B(x) \). Exhibit 4.12 illustrates the cumulative probability distribution function that shows stochastic domination of \( F_A(x) \) over \( F_B(x) \).

Exhibit 4.12
Cumulative distribution function

Let us assume that there are two different projects A and B that have income expectation \( E_A[x] \) and \( E_B[x] \) respectively. The two projects are equally prospective/profitable if only \( E_A[x] = E_B[x] \). The income expectation can be expressed as follows:

\[
\int_a^x x f_A(x) \, dx = \int_b^x x f_B(x) \, dx
\]  

(4.14)

The total expectation of the project is the positive expected returns minus negative expected returns \( (E[x]^{+}_x - E[x]^{-}_x) \). If project A generates positive expected returns

\(^{10}\) Further discussion for the theory of stochastic dominance can be found in Litzenberger and Huang (1991).
higher than the positive expected returns of project B \( (E_A[x]^+_0 > E_B[x]^+_0) \), equal rate of returns of the projects are the same if \( E_A[x]^+_a > E_B[x]^+_b \) or \(-a < -b\) (see appendix 4.A for mathematical derivation). Intuitively, if there is a project that generates high-expected positive return (profit), one can accept high-expected negative return (loss). On the contrary, one can accept low-expected negative return, if the project generates low-expected positive return.

Exhibit 4.13
Distribution function for expected returns

Exhibit 4.13 shows the expected return of the two projects (the distribution function times the value of possible returns).

The contract choice
Let us assume that the utility of every Muslim depends upon two general determining factors: monetary return and religious motives (4.15).

\[ U = f(x, R) \]  

(4.15)
The marginal utility of the individual depends upon those two variables. If the monetary return is also determined by religious motives (the level of sharing), then the relationship among those variables is given in (4.16).

\[
dU = \frac{\partial U}{\partial x} dx + \frac{\partial U}{\partial R} dR \quad \text{and} \quad x : f(R), \quad \text{then},
\]

\[
dU = \left[ \frac{\partial U}{\partial x} \frac{\partial x}{\partial R} + \frac{\partial U}{\partial R} \right] dR
\]

\quad \text{Exhibit 4.14}

\text{Utility optimisation}

(a) Positive correlation between monetary and religious utility

(b) Negative correlation between monetary and religious utility
In the case where a higher level of religious compliance causes a negative result, the optimality of the contract is given by (4.16) and graphically illustrated in Exhibit 4.14.

\[
\frac{\partial U}{\partial x} \frac{\partial x}{\partial R} = \frac{\partial U}{\partial R}
\]

Exhibit 4.14 (a) illustrates the utility optimisation process if the religious compliance is positively correlated with the monetary result. The utility of the individual will increase as the level of religious compliance increases.

Exhibit 4.14 (b) illustrates the utility optimisation process if the religious compliance is negatively correlated with the monetary result. The optimal utility will be achieved when the marginal disutility resulting from the monetary loss is equivalently compensated for by the increase in religious utility as a result of higher religious compliance.

More practically, we may assume that the utility functions of the investors are given by (4.17).

\[
U = U(x(R)) + U(R)
\]

(4.17)

Let us assume that we have two different conditions that may give different levels of outputs. In condition 1, we have a sufficient level of information and industrious agents. The investors may expect a higher level of income when they engage in sharing contracts. In condition 2, we have an insufficient level of information and non-industrious agents. In this case, the investors may expect a lower level of income when they engage in sharing contracts.
Graphically, Exhibits 4.15 (a) and (b) illustrate in 2-dimensionally different investors having different types of religious preferences in two different business environments: pessimistic and optimistic conditions. From the illustration, we can see two different optimisation processes. The non-religious motivated investors will, pragmatically, choose two different types of transactions in different business environments. In a developed financial environment, when sharing contracts may give higher rates of return, the non-religious investors will go to dividend-based markets. In a less developed financial market, the non-religious investors will go for fixed-return based contracts. The religious investors, in an advance financial market, will go for sharing-based contracts for two reasons: monetary returns and religious motives. However, in a less developed financial market, religious investors will go for hybrid-contracts, which to some extent still protect their minimum financial security.

Exhibit 4.15
Utility optimisation processes with different types of religious utility and different business environments

11 We use the exponential utility functions to simulate the two extreme conditions. As discussed in Booth (1997), the feature of exponential utility function is that the individual exhibits 'constant absolute risks aversion'. For simplicity, the monetary return utility and religious utility are characterized by the same utility functions. The utility functions are expressed as follows:

\[ U(x) = e^{-\alpha x}, \quad U(R) = e^{-\beta R}, \quad \text{and} \quad x = \Omega + \Gamma R \]. In an optimistic condition, \( \Gamma \) is assumed to have positive value and negative value in a pessimistic condition.
4.4. Types of Contract Available in Islamic Banks

4.4.1. Sharing based contract (SBC)

In a sharing-based contract, the principal (bank as the lender or investor to a bank) expects a wide range of expected returns. The principal may expect very high rate of return if the agent (bank as the trustee to investor or entrepreneur as the agent to a bank) can perform very well. But, if the entrepreneur does not perform very well, the principal may face financial losses or may even lose all his capital. The principal and the agent may determine either profit/loss or revenue as share base depending upon their confidence on the accounting standard used.

\[
\overline{SBC} = SBC + \Delta SBC \\
- SBC < \Delta SBC < \infty
\] (4.18)

The inequality (4.18) shows the wide range of possibility of financial returns (\(\Delta SBC\)) expected by the principal.

On the liabilities side, SBC is implemented into several products that covers equity shares (EC), restricted investment deposit (PSIAR), and unrestricted investment deposits (PSIA'). On the assets side, SBC is implemented into several products that covers financial participation in companies/financial institutions, join-financing (musharaka) and venture capital (mudaraba)

4.4.2. Hybrid contract (HYB)

In a hybrid contract, the principal will receive semi-definite positive monetary returns, as defined in inequality (4.19). Like the SBC, the share base can be either profit/loss-based or revenue-based.
The principal still gets a minimum level of certainty (at least the monetary return will not be less than zero). On the liabilities side, hybrid contract is used in the saving accounts, where the principal amounts of deposit funds are guaranteed. Most of investors of Islamic banks place their funds in hybrid type contract since they need their principal value guaranteed although they share the monetary surplus (as a form of compliance with the sharia principles). In some cases, Islamic banks are even under pressure to give a minimum rate of return to their depositors in order to induce those investors to maintain their funds with the banks although this practice is obviously prohibited by the Islamic concept (AAOIFI, 1999). On the assets side, many Islamic banks have also used this type of scheme. In order to enhance the repayment capacity on the principal amount, most of Islamic banks require the borrowers to provide collateral that can be executed when the borrowers fail to fulfil their financial obligations. To some extent, the existence of hybrid contract can be considered as a stepping stone before SBC can really implemented in the Muslim society.

4.4.3. Mark-up contract (MU)

Mark-up contract is, basically, a predetermined return type of contract. This type of contract is used when the profit and loss sharing concept is not possible to apply such as trade financing activities. As expressed in equation (4.20), the monetary return is determined in advance. The predetermined returns should not be benchmarked to the interest rate, but it should be accorded with the average returns in typical industries.

\[
\overline{M} = M + \Delta M
\]  

\(\Delta M\) is fixed in advance
On the liabilities side, mark-up contracts may appear in its balance sheet when the bank purchase such leasing products (ijarah). On the assets side, the mark-up contract is implemented in a number types of products that include trade financing (murabaha), leasing (ijara), production financing (salam/ishtishna) (although the lender is still exposed to the market risk). Most of Islamic banks apply a requirement for collateral to enhance repayment capacity.

All the products offered by Islamic banks can be classified into three base financial contracts. Exhibit 4.16 summarises possible types of contracts available in Islamic banks and their financial characteristics.

Exhibit 4.16
Types of contracts and the level of risks

<table>
<thead>
<tr>
<th>Types of contracts</th>
<th>Sources of uncertainty</th>
<th>Probability of losses</th>
<th>Level of risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure sharing contract</td>
<td>Profit and loss based</td>
<td>Revenue and cost</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Revenue based</td>
<td>Revenue</td>
<td>Yes</td>
</tr>
<tr>
<td>Hybrid between sharing and fixed return contract</td>
<td>Profit and loss based</td>
<td>Revenue and cost</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Revenue based</td>
<td>Revenue</td>
<td>No</td>
</tr>
<tr>
<td>Fixed return contract</td>
<td>-</td>
<td>-</td>
<td>No</td>
</tr>
</tbody>
</table>

4.5. Summary

The basic operation of an Islamic bank is derived from the concept of partnership and typical religious rulings. However, the early concept of an Islamic intermediary scheme, that is called ‘two-tier mudaraba’, creates two major problems. First, it provides less flexibility to depositors in using their funds since they are treated just like pure
investors. Second, it is vulnerable to informational problems, such as moral hazard/agency problems.

The types of contracts are, as a matter of fact, the results of bargaining processes between principals and agents. The more risk averse the contracting parties, the higher the level of certainty required. The level of uncertainty is affected by the productivity level and degree of information symmetry. In a sharing contract, the capital holder (principal) may face informational problems that happen before (ex-ante) and after the contract (ex-post). Before the contract is signed, the principal may face an adverse selection problem, where the entrepreneur (agent) can exploit his informational rent to maximise his utility. After the contract is signed, the principal may face moral hazard problem, where the principal will not be able to observe the actual effort made by the agent. Another possible problem can happen as a result of poor accounting standard applied in the industry that can put the contracting parties into a dispute of cost and revenue recognition.

In a Muslim society, we may find people having different levels of religious motives. The call for sharing will be implemented depending upon their religious sensitivity. In an optimistic situation, non-religious and religious types of people may go for sharing contracts since they may expect a higher rate of return while complying with religious rules. In an adverse situation (pessimistic), the two different types of people may choose different types of contracts. Non-religious people might choose fixed-return contracts since they expect only a higher monetary return. Religious people might choose hybrid types of contracts. With the hybrid contracts, religious people may have a certain level of financial security besides also, to some extent, allowing them to comply with religious norms.

Current Islamic banking operations provides various types of products to meet different levels of risk aversion. On the liabilities side, investors may choose savings deposit types of investment, which guarantee the principal value of the investments. The
investors may also choose investment deposits if they want to share the risk and return with the bank (assumed more sophisticated and risk neutral). On the assets side, the banks also have various kinds of products to meet the needs of practicality and different levels of risk aversion when facing different types of investments.
Appendix 4.A

The derivation of the stochastic dominance

Equal expected returns for two different projects are formulated as follows:

\[ E_A[x] = E_B[x], \quad \text{or} \]
\[ \int_a^x x f_A(x) \, dx = \int_b^x x f_B(x) \, dx \]

It is assumed that \( F_A(x) \) is dominant over \( F_B(x) \) (first stochastic dominance (FCD)), i.e. \( F_A(x) \geq F_B(x) \). To simplify the problem, the variables of partial integration are defined as follows:

Let \( U = x \), \( dU = dx \)
\[ V = F_A(x), \quad dV = f_A(x) \, dx \]

Then we have,

\[ x F_A(x) \bigg|_a^\bar{x} - \int_a^\bar{x} F_A(x) \, dx = x F_B(x) \bigg|_b^\bar{x} - \int_b^\bar{x} F_B(x) \, dx \], or

\[ \bar{x} [F_A(\bar{x}) - F_B(\bar{x})] + b F_B(b) - a F_A(a) = \int_a^\bar{x} F_A(x) \, dx - \int_b^\bar{x} F_B(x) \, dx \]

The cumulative probability density function for any distribution function have value 1 at the highest possible outcome \( \bar{x} \); thus,

\[ F_A(\bar{x}) = F_B(\bar{x}) = 1 \]

\[ b F_B(b) - a F_A(a) = \int_a^\bar{x} F_A(x) \, dx - \int_b^\bar{x} F_B(x) \, dx \]

Let assume: \( a, b \in x < 0 \); then,
\[ b F_B (b) - a F_A (a) = \int_0^x F_A (x) \, dx - \int_0^x F_B (x) \, dx + \int_a^0 F_A (x) \, dx - \int_b^0 F_B (x) \, dx \]

\[ \int_a^b F_A (x) \, dx - \int_a^b F_B (x) \, dx > 0 \]

Hence,

\[
\begin{bmatrix}
 b F_B (b) + \int_b^0 F_B (x) \, dx \\
 a F_A (a) + \int_a^0 F_A (x) \, dx 
\end{bmatrix}
\]

\[
\begin{bmatrix}
 b F_B (b) + \int_b^0 F_B (x) \, dx \\
 a F_A (a) + \int_a^0 F_A (x) \, dx 
\end{bmatrix}
\]

if, (a). \( \int_b^0 F_B (x) \, dx = \int_a^0 F_A (x) \, dx \), we find that \( -a < -b \). Then (b). \( b F_B (b) > a F_A (a) \), so that \( \frac{F_B (b)}{F_A (a)} > \frac{a}{b} > 1 \). Then the result is consistent that \( -a < -b \).
CHAPTER 5
THE CONCEPT OF CAPITAL FOR ISLAMIC BANKS AND
THE IMPLICATIONS FOR CAPITAL ADEQUACY REQUIREMENTS

5.1. Introduction

Capital adequacy has become one of the most important indicators for assessing the soundness of banking operations. Due to its importance, the western banking system has already established internationally recognised capital regulations, which are formulated by the Basel Committee on Banking Supervision. In its latest consultative document, the new Basel capital accord (issued in January 2001) covers not only the calculation of capital adequacy ratios but also other supporting issues, like sound supervisory processes and market discipline.

Many steps have, in the recent past, been taken to devise an appropriate framework for capital regulation of Islamic banks. As reviewed earlier, the AAOIFI released a statement on the purpose and calculation of the capital adequacy ratio for Islamic banks in 1999, although the concept seems to need continual review. Khan and Chapra (2000) have also proposed a fundamental concept of capital adequacy for Islamic banks.

The capital regulation has a wide impact on the financial system. At the micro level, the objective of capital regulation is to improve the operational sustainability of an individual bank. At the macro level, the objective of capital regulation is to enhance systemic stability. Islamic banks perform fiduciary roles and agency roles at the same time. The capital adequacy standard should be designed to reflect banks’ risk taking capacity and to promote a better quality of sharing contract.

Technically, appropriate risk assessment techniques will also improve the effectiveness of capital regulations in maintaining the soundness of banking operations. Islamic
banking can benefit from recent development in risk assessment techniques applied in western banking, besides also developing certain risk assessment techniques to capture financial risks that exist only within Islamic banking operations.

5.2. Financial structure of an Islamic Bank

5.2.1. The building blocks

A. General features of the liabilities side
As reviewed earlier, in the paradigm version of Islamic banking, all the depositors should place their funds in investment deposits (PSIA). The value of liabilities is always equal to the value of the asset since the depositors put their funds in equity-based investments. Therefore, the paradigm versions of Islamic banks, structurally, do not need a financial cushion. From the capital composition’s point of view, Islamic banks can be equated with the open-ended-mutual funds companies. There is merit in the argument that Islamic banks in such cases are not under pressure to stabilise the periodic disbursements to account holders. However, the bank must declare the Net Asset Value (NAV) of these funds at frequent intervals to enable investors to continuously monitor the performance of the bank. A rational investor should not expect a stable income unless the asset composition of the bank is predominantly in non-PLS products.

Errico and Farahbaksh (1998) state that the ability of Islamic banks to reduce the capital value of investment deposits, in an excessive sense, could introduce strong incentives for moral hazard that could result in systemic risk. Islamic banks should provide more sophisticated schemes that give more protection to depositors’ funds in order to gain public confidence and, finally, to improve the robustness of the banking system. There are at least two key factors in an Islamic environment to help prevent the corrosive effect of problem assets on the level of capital. First, Islamic banks should have a more developed concept of the adequacy of valuation reserves. It is argued that a case of a
loss should not be viewed as an automatic setting aside of provisions against loan losses. Second, Islamic banks should have an ability to administer and collect their loans effectively.

In current practice, Islamic banks' activities diverge from the paradigm version in several ways. Some Islamic banks explicitly or implicitly guarantees all deposits, including investment deposits. Some Islamic banks give a guarantee on the expected rate of return on saving deposits. These financial guarantees are given to make Islamic banks more competitive in the global market although, conceptually, it is not in accordance with the sharia rules. In the western environment, risk-averse depositors (households) place their funds in debt liabilities rather than in the financial intermediaries' stocks since they want to limit the risk on the assets, and maximise liquidity. The depositors are not supplied with sufficient information that can be used to evaluate the real value of claims held by the banks. The western banks have to be able to fulfil financial obligations, which are fixed, whilst managing risky assets which are fluctuating in value. Hence, the existence of bank capital is the consequence of the nature of the contract. This is the reason why minimum capital ratios have become a key part of current prudential regulations in Islamic countries.

Current Islamic banking practices provide various schemes of investments to fulfil the different needs of depositors. As reviewed in the previous chapter, there are three major types of depositors' funds. First, non-investment deposits. Second, restricted investment deposits. And thirdly, unrestricted investment deposits. Different deposit schemes can be viewed as a contract menu provided for different types of depositors. Depositors might have opportunities to compose their portfolio of deposits according to their own needs. An investor may need portfolio investment that comprises different levels of risks at the same time. Risk-neutral depositors will choose a higher proportion of risky assets while risk-averse depositors will prefer a higher proportion of riskless assets.

1 The model relates an individual's utility function to the minimum risk premium required to induce full investment in the risky assets. The higher the level of risk aversion, the higher the risk premium required to induce full investment in the risky assets (see Huang and Litzenberger, 1991).
Non-investment depositors (SA)

Non-investment depositors are risk-averse investors who are not willing to participate in the uncertainty of business. Although there is no fixed return required, a principal amount guarantee resembles a debt-based liabilities system and hence they need a sound repayment capacity of the bank at the time they want to liquidate their assets.

Unrestricted investment depositors (PSIA$^U$)

Unrestricted investment depositors exhibit a higher level of risk taking behaviour since they are willing to take part in the uncertainty of business; therefore, they will face the possibility of profits and losses. The position of these depositors and the banks involves principal-agent relationships dealing in PLS contracts. On behalf of shareholders, managers are contracted to carry out business activities. Once they have agreed upon the contract (signed by both parties), the bank will carry out business actions to fulfil what is written in the contract.

Restricted investment depositors (PSIA$^R$)

Restricted investment depositors can be considered as sophisticated investors since they are involved in making investment decisions. Islamic banks, in this case, act as investment administrators; therefore all responsibility for any loss should fall on depositors. For this reason, the AAOIFI suggests that restricted investment deposits are not included in the Islamic banks' balance sheets. Restricted investment depositors only need administrative and information services that allow them to assess their investment performance clearly. Islamic banks normally charge fees for delivering these informational and administrative services. Therefore, there is no need to apply any regulation since restricted investment depositors are fully informed and realise the risks they are running as a result of their investment decisions; the financial regulators' objective should be to only protect unsophisticated (assumed less informed) and dispersed depositors.
Shareholders
The shareholders of Islamic banks receive their monetary surplus from profit shared. If the bank earns profits, the shareholder will obtain a profit share and an additional profit share as a management fee. If the bank generates losses, the shareholders and unrestricted investment depositors will share the losses. The shareholders in this event are not entitled to any additional monetary surplus for a reward for managing the unrestricted depositors’ funds.

The income streams for shareholders, depositors and savings account holders, as a result of business activities, are illustrated in Exhibit 5.1. \( p_{EC}, p_{PSIAU}, p_{SA} \) and \( p_f \) define income for shareholders, unrestricted investment depositors, saving depositors and extra monetary surplus for shareholders if the bank earns substantial profit. The net earning gained by the bank (\( x \)) gives different income (\( \pi_{EC}, \pi_{PSIAU} \) and \( \pi_{SA} \)) for shareholders, unrestricted investment depositors and savings depositors respectively. If the bank generates losses, the shareholders and the unrestricted investment depositors will share the losses (\( \frac{p_{EC}}{p_{EC} + p_{PSIAU}} \) and \( \frac{p_{PSIAU}}{p_{EC} + p_{PSIAU}} \) respectively).

Exhibit 5.1
Income streams in Islamic banks

a) Income stream for shareholders

b) Income stream for unrestricted investment depositors

c) Income stream for saving accounts or current account depositors
Profits earned will be shared among shareholders, unrestricted investment depositors and saving accounts/current account depositors. The shareholders will also enjoy an extra profit share \( (p_f) \) as a reward for infinite equity participation\(^2\), therefore shareholders will get a profit share proportional to their financial participation and the monetary surplus earned by the bank from the management fee.

### Exhibit 5.2
Payback guarantee and incentives for Islamic bank investors

<table>
<thead>
<tr>
<th>Source of bank funds</th>
<th>Payback guarantee</th>
<th>Type of depositors</th>
<th>Role in investment decision</th>
<th>Incentives for investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners' equity (EC)</td>
<td>Like in a conventional bank, owners' equity is not guaranteed.</td>
<td>-</td>
<td>Dividend</td>
<td></td>
</tr>
<tr>
<td>Non-investment deposits (SA)</td>
<td>Deposit is repayable in full. To guarantee the repayment, the deposit is backed by owners' equity.</td>
<td>Unsophisticated and risk averse</td>
<td>None</td>
<td>Bonus</td>
</tr>
<tr>
<td>Investment deposits</td>
<td>Restricted (PSIA(^R))</td>
<td>Restricted investment deposits are not considered as liabilities of the bank. The bank would not share in any losses, which would be absorbed entirely by the restricted investment holders, since the bank does not have an unconditional right to use or dispose of this fund.</td>
<td>Sophisticated and risk taking</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Unrestricted (PSIA(^U))</td>
<td>The bank is not obligated in case of loss to return the original amount of funds received from the account holders unless the loss is due to negligence or breach of contract</td>
<td>Unsophisticated and moderately risk taking</td>
<td>None</td>
</tr>
</tbody>
</table>

\(^2\) Unrestricted investment depositors and an Islamic bank can be viewed as a principal and an agent that engage in a contract to conduct business activities. An agent is entitled to have some profit shares as a management fee in managing the principal’s fund. In this case, the shareholders of an Islamic bank are entitled to enjoy a monetary surplus from management fees as a reward for managing the depositors' funds.
The profit shares for shareholders, unrestricted investment depositors and savings/current accounts depositors are 
\[ \frac{p_f + p_{EC}}{p_f + p_{EC} + p_{PSIA} + p_{SA}}, \]
\[ \frac{p_{PSIA}}{p_f + p_{EC} + p_{PSIA} + p_{SA}} \text{ and } \frac{p_{SA}}{p_f + p_{EC} + p_{PSIA} + p_{SA}} \] respectively.

A summary of the financial characteristics of the liabilities side of an Islamic bank is illustrated in Exhibit 5.2.

Generally, the financial products in the liabilities side can be divided into two types of claims: fixed claims and variable claims. The fixed type of claim consists of the fixed part of saving accounts (SA{\text{Fc}}). The variable types of claim consist of equity capital (EC), variable parts of saving accounts (SA{\text{Vc}}), and unrestricted investment deposits (PSIA{\text{U}}). The building block for the liabilities side of an Islamic bank is illustrated in Exhibit 5.3.

**Exhibit 5.3**  
The building blocks of the liabilities side

<table>
<thead>
<tr>
<th>Products</th>
<th>Fixed claims</th>
<th>Variable claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA{\text{Fc}}</td>
<td>Fixed</td>
<td>-</td>
</tr>
<tr>
<td>SA{\text{Vc}}, PSIA{\text{U}}, EC</td>
<td>Undetermined</td>
<td>Fixed</td>
</tr>
</tbody>
</table>

B. Basic features of the assets side

Islamic banks have two general types of loan portfolio i.e. a sharing-based loan portfolio and a non-sharing based loan portfolio. The sharing-based contract is encouraged to improve long-term partnership between lenders and borrowers whilst the non-sharing-based contract is used to meet practical demands (short-term contracts).
Exhibit 5.4 shows the distinguishing characteristics of sharing-based assets from non-sharing-based assets.

**Exhibit 5.4**
**Distinguishing characteristics of sharing based assets**

<table>
<thead>
<tr>
<th></th>
<th>Sharing-based assets</th>
<th>Non-sharing based assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Determination of monetary rewards</td>
<td>Sharing rate of monetary surplus is determined <em>ex-ante</em>. Monetary reward is determined <em>ex-post</em>.</td>
<td>Monetary reward is determined <em>ex-ante</em>.</td>
</tr>
<tr>
<td>2. Objectives</td>
<td>Emphasise the partnership between the lender and the borrower.</td>
<td>Emphasise the practicality when sharing schemes cannot be applied.</td>
</tr>
<tr>
<td>3. Terms</td>
<td>Usually applied for medium to long term contracts.</td>
<td>Usually applied for short to medium term contracts.</td>
</tr>
<tr>
<td>4. Functions of collateral applied</td>
<td>Collateral is held to reduce moral hazard by an agent in case of breaching the agreed contract.</td>
<td>Collateral is held to assure repayment by the borrowers when the contract is due.</td>
</tr>
<tr>
<td>5. Expected return</td>
<td>Fully depends on individual and industrial performance.</td>
<td>Depends directly on the market benchmarks.</td>
</tr>
</tbody>
</table>

The financial products of an Islamic bank can be classified into three general types of claim: fixed claims in terms of final value, fixed claims in terms of inventories; and variable claims. There are several products that can be classified into the first category i.e. murabaha/mark-up (MR), bai’ bithaman ajil/deferred sale (BBA), ijarah/leasing (IJ), the fixed part of hybrid contract (\(SH_H\)), and the fixed part of qard al hassan/benevolent loan (\(QH_F\)). The values of second types of claims depend upon market variables. The real values of the products can be known through a marked-to-market process. The products include salam/agricultural product financing (SA), istishna/project financing in manufacturing (ISH), and al-Dayn/foreign-exchange trading (DA). The values of the third types of claim fully depend upon the real productivity of the entrepreneurs. The products include the variable parts of sharing
products \( (\text{SH}^\text{HYB}) \) and full sharing products \( (\text{SH}) \). The general building block of financial products on the assets side is illustrated in Exhibit 5.5.

**Exhibit 5.5**
The building blocks of the assets side

<table>
<thead>
<tr>
<th>Products</th>
<th>Fixed claims</th>
<th>Variable claims ((\lambda))</th>
</tr>
</thead>
<tbody>
<tr>
<td>((\text{MR}) (\text{BBA}) (\text{IJ})) ((\text{SH}^\text{HYB})^\text{FC} (\text{QH}^\text{FC}))</td>
<td>Fixed</td>
<td>-</td>
</tr>
<tr>
<td>((\text{SA}) (\text{ISH}) (\text{DA})) ((\text{SH}^\text{FC}) (\text{SH}))</td>
<td>Marked to market</td>
<td>Fixed</td>
</tr>
<tr>
<td>((\text{SH}^\text{HYB}) (\text{SH}))</td>
<td>Undetermined</td>
<td>Fixed</td>
</tr>
</tbody>
</table>

For more details about the variety of investments see Haron and Shanmugam, 2000; Errico and Farahbaksh, 1998; and Haron, 1998.

5.2.2. Contractual arrangements within an Islamic bank

An Islamic bank uses various types of financial contracts. Exhibit 5.6, section (a) shows three types of deposits on the liabilities side of an Islamic bank: non-investment deposits \([\text{SA}]\); unrestricted profit-sharing investment deposits \([\text{PSIA}^\text{U}]\); and restricted profit-sharing investment deposits \([\text{PSIA}^\text{R}]\). Islamic banks guarantee the principal amount of deposits and share any monetary surplus with the \([\text{SA}]\), whilst they share the profit or losses with the \([\text{PSIA}^\text{U}]\). Islamic banks provide only administrative services to the \([\text{PSIA}^\text{R}]\) since the depositors are themselves actively involved in investment decision making. This demonstrates that Islamic banks perform fiduciary and agency roles at the

---

3 The \([\text{PSIA}^\text{R}]\) depositors have the right to determine the investment types chosen, the banks merely provide them with information about feasible investments. Therefore, the \([\text{PSIA}^\text{R}]\) depositors take responsibility for investment risk.
same time. Islamic banks should maintain their repayment capabilities for the risk-averse depositors, and deliver the highest monetary return possible to the risk-taking investors.

However, the proportion of $PSIA^U$ to total assets varies depending upon the preferences of the investors; the higher the proportion of $PSIA^U$, the more significant the agency role undertaken (i.e. the $PSIA^U$ give full authorization to the bank to take all decisions relating to the investment process). On the contrary, the higher the proportion of $SA$, the more significant the fiduciary role undertaken (i.e. the bank should strive to maintain the value of the $SA$ first and foremost). The capital regulations for Islamic banks should be capable of enhancing the fiduciary roles performed for risk-averse depositors, and the agency roles performed for risk-taking investors.

**Exhibit 5.6**
Inter-relationships within an Islamic bank
Exhibit 5.6, section (b) shows various types of investment on the assets side of an Islamic bank. These investments can be classified into PLS- and non-PLS-based investments. Mudaraba and musharaka modes of financing can be classified as PLS-based investments [PLSI] whilst murabaha, ijara and salam can be classified as non-PLS-based investments [MUI-denoting `mark-up'-based investments]. In practice, there also exist hybrid-types of investment [HYB] that combine the two basic modes of finance [i.e. some part of the claims is fixed and some part is variable. For example: lending money with a guarantee on the repayment of principal but also sharing the profits]. Individual Islamic banks select their preferred compositions of assets. [For more details about the variety of permissible Islamic investments, see Haron and Shanmugam, 1997; Errico and Farahbaksh, 1998; and Haron, 1998].

Exhibit 5.6, section (c) shows the pivotal position of the banking regulator, who is trying to ensure the sustainability of the savings/investment process. The regulations implemented should be able to provide the right incentives and protection for all market players to induce them to behave prudently. Besides designing a proper set of financial ratios for capital regulation, the regulators of Islamic banks should also consider adopting the second and third pillars of the Basel Committee’s new capital accord to empower the supervisory process and to improve transparency in the banking system.

A financial cushion is required by an Islamic bank to absorb financial losses. An Islamic bank with a high proportion of SA needs a high financial cushion to underpin its operations. For unrestricted investment depositors, equity capital can be viewed as a financial participation in a PLS contract that may give an incentive to the shareholders to more actively monitor the activities of the bank.

A possible regulatory framework designed for the capital adequacy assessment of Islamic banks is summarised in Exhibit 5.7, and is explained more fully below.
Exhibit 5.7
Possible Regulatory Approach Based on Characteristics of Deposits

<table>
<thead>
<tr>
<th>Debt based depositors</th>
<th>Repayment assurance for debt based liabilities</th>
<th>Financial buffer</th>
<th>Sufficient equity participation/capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrestricted investment depositors</td>
<td>Reducing moral hazard</td>
<td>Monetary incentive in the principal-agent relationship</td>
<td></td>
</tr>
<tr>
<td>Restricted investment depositors</td>
<td>Reducing asymmetric information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.3. The proposed capital adequacy regulation for Islamic banks

5.3.1. A Critique of the AAOIFI approach

Although significant efforts have been made for designing a more appropriate capital regulation for Islamic banks, there are a number of criticisms to be addressed. First, the existing capital adequacy ratio developed by the AAOIFI is only designed to assure a given level of solvency and ignores the agency roles performed by Islamic banks and the principal/agent relationships involved. Second, there has been an inconsistency in defining the restricted investment deposits. According to the international accounting standards developed by the AAOIFI (AAOIFI, 1997), PSIAR type of deposits cannot be recognised as liabilities of Islamic banks and should not be reflected on the banks’ statements of financial positions. This is because the depositors are highly involved in investment decisions. Thus, it can be argued that PSIAR-financed assets should be excluded from the risk-weighted assets in the denominator of the CAR. Yet in the CAR, no distinction is drawn between PSIAR and PSIA. (From now on, I exclude PSIA from the analysis) And third, the possibility of a bank facing ‘an abnormal risk’ arising...
from a managerial dispute (i.e. where the $PSIA^U$ depositors consider that a bank has neglected or breached the contract agreed upon) should be seen as legal risk, which ideally requires a case by case approach being taken (i.e. depending upon the terms used in the contract. In this case, the bank should be able to identify the difference between deposit taken on a pure PLS basis and those representing a hybrid contract. Deposit with any potential claim (partly) should be classified as a hybrid-type of contract.

In practice, Islamic banks may have different proportions of $PSIA^U$ in their balance sheets. The variability of the $PSIA^U$ proportion is simulated in the following analysis (see Appendix 5.A for the underlying assumptions used and full details, and Exhibit 5.A.1 for data simulation). Exhibit 5.8, section [a] shows the ratio of $OC$ to $PSIA^U$ as a function of the percentage of $PSIA^U$ to total assets [$TA$]$^4$. This indicates that Islamic banks, which have a higher proportion of $PSIA^U$ within their assets, will have a lower proportion of $OC$ to $PSIA^U$.

**Exhibit 5.8 (a)**

*Proportion of $OC$ to $PSIA^U$ as a function of the ratio of $PSIA^U$ to $TA$*

---

Data source: Exhibit 5.A.1 in Appendix 5.A

$^4 TA$ is equal to the total of $OC$, $SA$ and $PSIA^U$. 

157
Exhibit 5.8, section (b) shows the relative agency (i.e. monitoring) cost \( \frac{V(e)}{\alpha(OC, PSIA^U)} \) as a function of the percentage of \( PSIA^U \) to \( TA \). This indicates that a higher level of relative agency cost is associated with a higher proportion of \( PSIA^U \) to \( TA \) as the latter implies lower monetary surplus for shareholders. A high level of relative agency cost thus implies a high probability that shareholders will exert less effort \( (e) \) to supervise the bank and instead, allocate their funds to a more profitable investment.

**Exhibit 5.8 (b)**

**Relative agency cost as a function of the ratio of \( PSIA^U \) to \( TA \)**

Data source: Exhibit 5.A.1 in Appendix 5.A

---

Shareholders of an Islamic bank are assumed to receive monetary surplus \( \alpha \) as a function of the proportion of \( OC \) to the total equity based capital \( OC + PSIA^U \). \( V(e) \) represent an opportunity cost as a result of spending time monitoring the activities of the bank. The higher the effort \( (e) \) given by the shareholders, the higher the opportunity cost. It is expressed in terms of a unit cost, \( \frac{V(e)}{\alpha(OC, PSIA^U)} \), which represents agency costs as a proportion of the monetary return received by the shareholders. A higher relative agency cost for the shareholders implies a higher probability of them abandoning the task of supervising the management since the monetary reward cannot sufficiently compensate for the opportunity cost incurred.
5.3.2. Possible improvements

A. Possible enhancement of fiduciary roles

*Prudent financial structure*

The assets and liabilities structure is an important feature of a prudent financial structure. Fulfilling the accounting principle that total assets must be equal to total liabilities, the total value of $PLS_t$, $HYB_t$, and $MU_t$ (i.e. the value of PLS-based, hybrid, and mark-up-based assets respectively) is equal to the total of equity-based capital [$EC_t$] and debt-based capital [$DBC_t$] in period $t$.

\[ PLS_t + HYB_t + MU_t = EC_t + DBC_t \]  \hspace{1cm} (5.1)

Therefore, the total cash flow of PLS [$APLS_{t+1}$], hybrid [$AHYB_{t+1}$] and markup-based assets [$AMU_{t+1}$] in the period $t+1$ is equal to the total cash flow of equity-based capital [$AEC_{t+1}$] and debt-based capital [$ADBC_{t+1}$] in period $t+1$. That is,

\[ APLS_{t+1} + AHYB_{t+1} + AMU_{t+1} = AEC_{t+1} + ADBC_{t+1} \]  \hspace{1cm} (5.2)

where:

- $PLS_t \leq \Delta PLS_{t+1} < \infty$,
- $0 \leq \Delta HYB_{t+1} < \infty$,
- $\Delta MU_{t+1} = \alpha MU_t$, $\alpha$: Average rate of mark-up,
- $\Delta EC_{t+1} = \beta(\Delta PLS_{t+1} + \Delta HYB_{t+1} + \Delta MU_{t+1})$ \hspace{1cm} (5.3)

---

6. Obaidullah [1999] also mentions the importance of maintaining a balance between PLS-based and non-PLS-based products on the assets and liabilities sides of an Islamic bank.

7. To keep it simple, we are making no distinction between equity capital and PLS-based deposits, and between general debt and other fixed-claim deposits i.e. $EC_t$ is assumed to include $PSIA^U$, and $DBC_t$ is assumed to include $SA$ and all other fixed claim liabilities.

8. The equation shows a possibility that the future value of a PLS-based asset might be zero (totally lost).
\[ \Delta DBC_{t+1} = (1 - \beta)(\Delta PLS_{t+1} + \Delta HYB_{t+1} + \Delta MU_{t+1}) \]

In an adverse condition when total cash flow is negative, risk-averse depositors [fixed claimant and hybrid deposit holders] receive nothing, i.e., \( \Delta DBC_{t+1} = \Delta HYB_{t+1} = 0 \). In order to prevent insolvency, the negative cash flow should be less than the equity-based capital, i.e.,

\[- \Delta EC_{t+1} \leq EC_t \] \hspace{1cm} (5.3)

Putting the value of \( \Delta EC_{t+1} \) from Equation (5.2) into Equation (5.3) yields:

\[ PLS_t \leq EC_t + \alpha MU_t \] \hspace{1cm} (5.4)

In an Islamic bank, collateral is applied to ensure repayment of the debt-based assets and to avoid contractual breaches in PLS contracts, with the consequence that the monetary surplus of the hybrid assets and the total value of the PLS-based assets are not also considered as liabilities\(^9\). Therefore, in order to implement a prudential banking operation and to ensure the sustainability of the banking operations, the value of \( PLS_t \) should not exceed the total value of \( EC_t \) plus the expected monetary surplus of the markup-based assets \( \alpha MU_t \) [as shown by Equation (6) above].

\(^9\) The equation shows that the expected return to the shareholders is proportionate to the sharing coefficient (\( \beta \)), and that if the bank experiences losses, the financial losses should be less than its loss absorbing capability.

\(^{10}\) Referring to the Basel Committee’s principles about credit mitigation, the collateral is mandatory to back-up the repayment if the loans are defaulted on. An asset which is not sufficiently backed-up by sound collateral, should be backed-up by equity capital. In the case above, the expected value of the PLS-based assets and the monetary surplus of the hybrid-based assets should be considered as zero \( (PLS_{t+1} = 0 \text{ and } \Delta HYB_{t+1} = 0) \).
Minimum level of net-worth

A requirement for a minimum level of net-worth (financial cushion) to enhance the capacity of a bank to maintain its solvency when facing temporary financial shocks has been adopted widely by Islamic banking regulators in many countries. However, the calculation of the CAR should only include the assets financed by debt-based liabilities and own capital\textsuperscript{11}. In other words, the capital adequacy ratio should be calculated as follows:

$$\text{CAR}' = \frac{OC}{RWA_{OC+DBC}},$$ \hspace{1cm} (5.5)

where $RWA_{OC+DBC}$ is the value of the risk weighted assets financed by $OC$ and $DBC$. Subject to this caveat, the regulators should adopt the same methodology used by the Basel Committee.

Islamic banks may have similar elements of capital to the western banks. The only difference is the elimination of the components that apply fixed-determined return to the investors. The AAOIFI as a centre for convergence of Islamic banking regulation has, currently, adopt the Basel’s methodology to classify the bank’s capital into Tier 2 and Tier 2 and its restrictions.

**Tier 1** - In the Tier 1 capital, Islamic banks cannot have perpetual preferred stock. This because, most kinds of preferred stocks pay the investors a fixed rate of income, which can be classified as predetermined return contract. The elements of Tier 1 Islamic banks’ capital might consist of paid-up capital/common stock and disclosed reserve (this also includes disclosed retained earning).

**Tier 2** - In the Tier 2 capital, Islamic banks cannot also have elements that are based on predetermined return contract such as subordinated loan and convertible bonds.
The elements of Tier 2 Islamic banks' capital might consist of undisclosed reserves, asset revaluation reserves and general provisions/general loan loss reserves. Investment (sharing based) deposits cannot be included in the Tier 2 capital since it is unusual for investment deposits to have at least 5 years maturity (AAOIFI, 1999).

B. Possible enhancement of agency roles

Minimum level of net-worth and shareholder value

The requirement for a minimum financial cushion is aimed at protecting the risk-averse depositors. This is also expected to enhance the agency role of Islamic banks, as explained below. In an Islamic bank, the level of $OC$ is not the only factor determining shareholder value. The $PSIA^U$ also proportionally affect shareholder value. The higher the proportion of $PSIA^U$ in total deposits, the higher the financial buffer for the bank; but, at the same time, the shareholders enjoy a lower level of earnings. Shareholder (deterministic) value is thus directly proportionate to the level of financial participation;

$$a = \frac{OC}{OC + PSIA^U}.$$

If $SA$ is dominant ($a \approx 1$) in the deposit mix, the shareholder value resembles that of western bank. If the net worth of the bank is negative (i.e. $OC$ plus $PSIA^U$ is negative), the bank is operated under the threat of liquidation by the banking regulator. In the liquidation process, the shareholders and equity-based depositors receive nothing. The savings depositors receive their financial claims in full (government deposit insurance arrangement) and the financial guarantor pays the difference between the claimed value and the real asset value of the bank.

As illustrated in Exhibit 5.9 (see Exhibit 5.B.1 for data simulation), the shareholders with a higher level of financial participation increase their risk aversion way before the net worth of the bank becomes negative, as compared with the shareholders holding a lower level of financial participation in a bank. This is because the former would suffer

---

11 Insolvency in an Islamic bank happens when $TA < DBC$.  

162
more from monetary loss than the latter. It can be concluded that a bank with a higher capitalisation will have a wider risk aversion threshold for shareholders, which might be able to act as a safer internal insurance mechanism.

Exhibit 5.9
Absolute risk aversion as a function of the net asset value

Data source: Simulation in Appendix 5.B

This theoretical analysis addresses the importance of financial participation by shareholders, especially when $SA$ is significant. From the analytical derivation (see Appendix 5.B), it is found that the proportion of $PSIAU$ in total deposits is negatively correlated with the level of risk aversion shown by shareholders\(^{12}\). And the higher the

\(^{12}\) This analysis, as a matter of fact, is a modification of the analysis by Milne and Whalley (2001) and aims at analyzing the shareholder value of Islamic banks under the threat of liquidation if the banks become insolvent. The reason for the liquidation process is because the banking regulator wants to minimize the systemic costs. In order to strengthen systemic stability, some countries that operate Islamic banks establish a safety net scheme to enhance the repayment capacity of the Islamic banking system for
financial participation by the shareholders, the more prudently the shareholders will behave. This phenomenon is quite important since the shareholders play important roles in directing the management of the bank.

*A requirement for minimum financial participation by shareholders*

PLS at least in theory, if not in practice, is the most distinguishing feature of Islamic finance. However, due to information asymmetry, agency problems are likely to exist\(^\text{13}\). The regulations implemented should be able to improve the quality of the contracts entered into, so that all the contracting parties benefit\(^\text{14}\). One possible option to improve the quality of the contracts is to require a minimum level of financial participation by the shareholders, \(OC\), proportionate to the \(PSIA'\) [imposed in addition to the Basel’s capital adequacy framework]. The mutual benefits for the contracting parties can be obtained under several assumptions [see Appendix 5.C for mathematical derivation]. First, the level of effort is positively affected by the sharing ratio. Second, the higher level of effort brings a positive monetary benefit. And third, the total increment of monetary surplus is higher than the opportunity cost. This is expected to enhance the agency role of Islamic banks.

5.3.3. The implications of the minimum capital ratio requirements

In the simulation (see Exhibit 5.D.1 in Appendix 5.D), we choose a minimum financial participation \(\frac{OC}{PSIA'}\) of 6% arbitrarily\(^\text{15}\). And, as in the previous simulations, the analysis is conducted by inputting all possible variations of the proportion of \(PSIA'\) to \(SA\). Shareholders’ minimum equity stake should be determined by the minimum CAR

---

\(^{13}\) PSIA' depositors engage in fixed term contracts; hence, they have less flexibility to withdraw their funds if the banks do not perform well financially.

\(^{14}\) Mathematically, this is expressed in Pareto optimality. Baldwin [2000] develops a basic framework for financial participation in a profit-sharing contract.

\(^{15}\) The optimal minimum financial participation, as a matter of fact, should be determined empirically.
of 8% [as indicated in equation 5.5] or the minimum financial participation requirement, whichever is the higher. This requirement has significant implications when $PSIA^U$ dominate the total liabilities of an Islamic bank.

Exhibit 5.10
The effects of imposing a minimum financial participation on shareholders
(a) On relative agency costs

Exhibit 5.10, section [b] shows that the $OC$ to $PSIA^U$ ratio becomes binding when the percentage of $PSIA^U$ to $TA$ becomes dominant. This can, alternatively, be expressed in terms of a requirement for a maximum level of relative agency costs (see section [a] of Exhibit 5.10). In other words, the shareholders should always maintain their financial contribution (equity stake) so that their effort to supervise the bank’s management is adequately compensated. The thick, thin and dotted lines represent possible risk-weighted assets values for 100%, 50% and 150% average risk weight respectively.
Exhibit 5.10 (b) On the relationship between the proportion of $OC$ to $PSIA^U$ and $PSIA^U$ to $TA$

![Diagram]

Data source: Exhibit 5.D.1 in Appendix 5.D

Exhibit 5.10 (c) shows the impact of applying the new capital framework proposed (see Exhibit 5.D.1 in Appendix 5.D for data simulations).

Exhibit 5.10 (c) On the relationship between the proportion of $OC$ to $TA$ and the $PSIA^U$ to $TA$ ratio

![Diagram]

Data source: Exhibit 5.D.1 in Appendix 5.D
The analysis shows that there are two constraints for a minimum level of capital adequacy for Islamic banks. Capital adequacy should be determined by:

1. the capital adequacy ratio (to assure the repayment capability) if the bank’s liabilities are dominated by debt-based contracts (hybrid products)(to the left of the star on Exhibit 5.10(c)); and

2. the minimum proportion of financial contribution \( \frac{OC}{PSIA^U} \) if the bank’s liabilities are dominated by investment deposits (i.e. \( PSIA^U \))(to the right of the star on Exhibit 5.10(c)).

5.3.4. Other aspects supporting sound capital adequacy regulation (Pillars 2 and 3 of the new Basel Committee)

*The risk management process*

Islamic banks, as financial institutions, face uncertainties of outcomes in providing financial services. The uncertainties of the outcomes will ultimately affect the asset values of the banks, subsequently affecting the sustainability of business activities in the long run. The investors and capital users of Islamic banks react in the same way to such concerns as everyone else. They are concerned about liquidity risk, credit (income risk) risk, market risk, legal risk (built-in protection in financial contracts) and overall economic risk (Vogel and Hayes, 1996). Risk management should, therefore, be in place to build awareness about their exposures to financial risks and to develop systems for their identification, control, management and measurement. Conceptually, the risk management process can be illustrated in a closed-loop control system, as in Exhibit 5.11.
Risk management in a bank, in fact, is a continuous process that minimizes the difference between the actual financial condition \( (f_a) \) and the preferred financial condition \( (f_p) \). The preferred financial condition is set by the regulator to ensure stability in operations. Asset valuation and risk assessment processes play very important roles in supplying information about the actual financial conditions. The asset valuation process in an Islamic bank needs sound accounting standards that also accommodate some operational differences. The risk assessment process needs to include every aspect that potentially causes financial losses. Therefore, all the operating functions in the banks should be aware of financial risks. Moreover, the banks should be well equipped with adequate technical skill in order to produce reliable information about risks. The result of the asset valuation and risk assessment processes can be considered as feedback to the management. The difference between the actual and the preferred financial condition \( (f_p-f_a) \) reflects the managerial achievement in the past and becomes the informational supplant for future operational policy by the management. Inaccurate information could lead to false perceptions and result in poor operational policy by the management.

The supervisors of Islamic banks also need to understand about the nature of risk in the Islamic banks and promote efficient risk management in an Islamic-banking environment. Therefore, a set of prudential regulations for Islamic banks, which is
supported by appropriate tools to support sound risk assessment and asset valuation processes, is needed to fairly measure their financial performances. The result of the risk assessment and asset valuation processes should reflect the risk-taking capacity of the evaluated banks.

Banking supervision is a continuous analytical assessment of the financial conditions of the banks in order to maintain stability and confidence in the banking system. Through the on-going process, the banking supervisory and regulatory authorities will always seek to minimise the risks in the banking system\(^{16}\). The banking supervisory and regulatory authorities, as a matter of fact, should be fully equipped with skilled staff, and adequate financial backup and technology so that they will be able to always deal with recent developments in the financial system. The financial risks faced by the banks will be different from time to time, depending on the rapid development of the financial system. Although bank supervisors cannot (nor should they) guarantee that banks will not fail, the potential for banking failure is an inherent part of the risk-taking process. The main objective of the supervisory and regulatory process is to maintain stability and confidence in the banking system by facilitating the exit of problem banks without causing contagion to the other banks i.e. minimising disruption to the system. The supervisors as well as the banks should be able to recognise, monitor and control the risks inherent in banking operations. To address this issue, and through the prudential guidelines, most banking regulators regulate some financial risks resulting from particular types of banking risk exposure. Sophisticated statistical models have even been implemented by banking supervisors to fairly assess the assets quality in a dynamic approach. Ultimately, effective financial risk management, close monitoring of risk exposures, and compliance with prudential guidelines set by effective banking regulations, are essential ingredients of an effective banking supervision process.

\(^{16}\) The supervisory process is usually conducted via particular actions: the issuance and withdrawal of banking licenses; the issuance and enforcement of prudential regulations and standards; prescribing covenant reports, such as establishing off-site and on-site inspections; assessing penalties and initiating emergency actions; and, liquidations.
Transparency in banking supervision

Bank supervision should be conducted transparently to assure that all substantial information is adequately disclosed. The banking supervisory and regulatory authorities use information disclosure to increase systemic stability in the banking system. Adequate information disclosure enables market participants to comprehensively evaluate banks' financial risks, especially in the increasingly volatile financial markets of today. Any misleading (inaccurate) information may possibly damage public confidence and even cause systemic instability in the banking system. A proper disclosure process may moderate the responses of market participants to bad news by helping market participants assess negative information and mitigate panic; hence, improved transparency through better disclosure may reduce the chance of systemic banking crises.

The information disclosed usually involves qualitative and quantitative information in annual financial reports, supplemented by biannual or quarterly financial statements and other important information. Through the high quality of information provided, banks will be able to always improve their reputation. Information disclosure involves not only providing the financial information, but also reporting the decision-making process through a timely reporting system. Information disclosure, as a matter of fact, would improve accountability in conducting fiduciary roles. Market participants, including banking supervisory and regulatory authorities, have wider opportunities to assess actions taken by the banks and apportion responsibility for both decisions and results. Information disclosure would improve the predictability and subsequently the efficiency of policy decisions. Moreover, it would improve internal discipline and promote better governance. According to Greuning and Bratanovic (1999), transparency and accountability are mutually reinforcing. Transparency emphasizes proper monitoring a process that will enhance accountability. Contrariwise, accountability that is represented in a reporting process will give an incentive to other market participants, ensuring that their actions are properly disclosed and understood.
One important aspect in the information disclosure process is a realistic asset valuation process, including sensitivities to future events and adverse developments. This issue addresses the importance of the evaluation of a bank’s entire risk profile, including future solvency risk, since all regulatory requirements are normally prepared under the assumption that the banks will continue to operate as a going concern. Insufficient information provided will potentially mislead other key players in the banking system and, more importantly, banks may not be aware of the true financial conditions.

The higher level of transparency (providing comprehensive financial reporting to the investment depositors describing the actual financial condition of their investments) can also enhance agency roles. Holmstrom (1979) proves, analytically, that a higher level of information shared will improve the quality of the contract. This informational requirement, as a matter of fact, has been outlined in the third pillar of the new capital accord of the Basel Committee. The regulators of Islamic banks can benefit from this established concept.

5.4. Safety net arrangements and systemic stability

Islamic banks and safety net arrangement

As has been acknowledged, the stability of Islamic banking systems is very important for the Islamic society. The regulatory authority for Islamic banks is in a position to ensure a sustainable savings/investment process; therefore, the implementation of deposit insurance arrangements seems to be unavoidable. Indeed, some deposit insurance arrangements have been implemented within Islamic banking systems in order to enhance the banks’ repayment capabilities to non-investment committed depositors (current and savings accounts). The existence of deposit insurance arrangement may create moral hazard problems. Islamic banking regulators also face a dilemma in dealing with ailing banks. In order to ensure the banks conduct fiduciary roles properly, the Islamic banking authorities should be able to design an optimal ‘closure’ rule, either to close down ailing banks early (as has been adopted by the U.S
banking authority under a prompt corrective approach (PCA)) or to subsidise them in order to give them a chance for self recovery. This analysis is, in fact, a modification of the model developed by Fries et al (1997) seeking for an optimal rules for bank reorganisation process.

The model
Let us assume that Islamic bank equity holders receive total net cash flow which is a function of the proportional profit share \( \alpha \cdot g \) minus the deposit insurance premiums paid \( K \cdot D \).

\[
\alpha \cdot g - K \cdot D
\]  

(5.6)

where \( \alpha \), \( g \), \( K \), and \( D \) represent the profit share ratio for shareholders, the income arising from the bank's portfolio, the deposit insurance ratio for debt-based deposits, and the bank's total deposits \( (PSIA + SA) \) respectively. It is assumed that the bank regulator levies a constant rate of deposit insurance premium as a proportion of insured deposits \( (K = \gamma k) \) where \( \gamma \) and \( k \) represent the deposit insurance premium per dollar and the ratio of debt-based deposits to total deposits \( \left( \frac{SA}{SA + PSIA} \right) \). The \( PSIA \) depositors are not covered in a deposit insurance scheme because their investments are equity based (they already understand that the result of the investment can be either positive or negative).

Suppose that \( g \) and \( D \) are correlated and follow geometric Brownian motions as expressed below.
\[ dg_t = \mu_g g_t \, dt + \sigma_g g_t \, d\omega_{1t}, \tag{5.7} \]
\[ dD_t = \mu_D D_t \, dt + \sigma_D D_t \, d\omega_{2t}, \]

where \( \mu_i, \sigma_i, \forall i = g, D \) are constant parameters, and \( \omega_{g_t}, \omega_{D_t} \) are standard Brownian motion with \( \rho dt = d\omega_{g_t} d\omega_{D_t} \). If it is assumed that the rate of return to shareholders consists of the flow of income to share holders plus expected capital gains, the market value for the bank’s equity \( (rU_t) \) will be:

\[ rU_t = \alpha g_t - K_s D_t + \frac{d}{d\Delta} E_t U_{t+\Delta} |_{\Delta}, \tag{5.8} \]

where \( U(k_t, D_t) = V(g_t / D_t) D_t \). By applying some mathematical manipulations (proof is given in Appendix 5. E), we can find the expression that satisfies a second order differential equation. Variable \( g_t / D_t \) is defined as \( k_t \).

\[ (r - \mu_g) V(k_t) = (\alpha_k k_t - K_s) + (\mu_g - \mu_D) k_t V'(k_t) + \frac{\sigma_k^2}{2} k_t^2 V''(k_t). \tag{5.9} \]

The solution for equation (5.9) is given below:

\[ V(k_t) = \left[ \frac{\alpha_k k_t}{(r - \mu_g)} - \frac{K_s}{(r - \mu_D)} \right] - \left[ \frac{\alpha_k k}{(r - \mu_g)} - \frac{K_s}{(r - \mu_D)} \right] \left( \frac{k_t}{k} \right)^{\lambda} \tag{5.10} \]

The first operator of equation (5.10) can be interpreted as the discounted per-dollar of deposit value of the equity holders’ cash flow under unlimited liability. The second

\[ ^{17} \text{It is assumed that the banks have an average rate of deposit growth and average rate of income. Standard Brownian motion expresses the level of uncertainties in both banks' deposit growth and rate of income.} \]
operator of equation (5.10) can be interpreted as an option value for equity holders if they want to abandon the bank in the event of failure. Assuming that closure procedures entails a lump-sum bankruptcy cost \( c(k^*) \) and the banking regulator expends monitoring cost of \( \xi_m \) per dollar of insured deposits\(^{18}\), the total claims of deposit insurance on the insurer will be \( M(k_t, D_t) = L(k_t)D_t \), where

\[
L(k_t) = \left[ \frac{K_s - \xi_m}{(r - \mu_D)} \right] - \left[ \frac{\alpha_s k^*}{(r - \mu_s)} - \frac{K_s - \xi_m}{(r - \mu_D)} - c(k^*) \right] \left( \frac{k_t}{k^*} \right)^{\lambda}
\] (5.11)

The second operator shows the option value for the regulators if the shareholders of the banks abandon the bank in the event of failure.

**Optimal stopping time**

Optimal stopping rules can be reviewed from two different points of views. The banking regulators will have their own agenda that involves minimising bankruptcy costs as a result of an appropriate bank closure process and effective monitoring. The bank regulators’ objectives can be formulated as in equation (5.12). The first and the second operators express the option value to continue the monitoring and the option value of having bankruptcy cost. If the banking regulator is not ready for an expensive monitoring cost (late closure approach), they tend to choose PCA and vice versa.

\[
k^{**} = \arg \min \left\{ c(k) \left( \frac{k_t}{k} \right)^{\lambda} + \frac{\xi_m}{(r - \mu_D)} \left( 1 - \left( \frac{k_t}{k} \right)^{\lambda} \right) \right\}
\] (5.12)

On the other hand, the shareholders also have their own optimisation process for determining the closure point that is beneficial for them. The optimisation process can

---

\(^{18}\) These assumptions are the same as those adopted by Fries et. al. (1997).
be obtained by optimising the shareholder value as expressed in equation (5.10) with respect to \( k \). (Mathematical derivation is given in the Appendix 5.E)

\[
k^* = \max \{ V(k) \}
\]

\[
k^* = -\frac{K_a (r - \mu_g) \lambda}{\alpha_e (r - \mu_D) (1 - \lambda)}
\] (5.13)

The equation (5.13) shows how the optimal value of \( k^* \) is determined by the capital structure. The higher the proportion of \( PSA^U \), the lower the option value to the shareholders.

**Exhibit 5.12**
Shareholder value and the regulator’s liability
The optimal trigger points derived from the two optimisations approaches will be different, as intuitively, we appreciate that the shareholders will only be willing to inject new capital if the insolvency level is not extremely low. Therefore, the optimal trigger point for closure will be:

$$\hat{k} = \max\{k^*, k^{**}\}$$

Exhibit 5.12 illustrates the value of the bank’s equity, which is expressed in equation (5.10), and the deposit insurance claims, which are expressed in equation (5.11). Exhibit 5.12 implies the following conclusions. First, the existence of debt-based liabilities (savings deposits) may create potential systemic liabilities when a safety net arrangement (deposit insurance) is introduced in an Islamic banking system ($L(k_r)$). Second, the option value (to either continue or abandon the bank) to the shareholders ($V(k_r)$) exists as a natural phenomenon as a result of financial uncertainty. Third, there is a need to determine an optimal closing rule for ailing banks that maximises social welfare.

**5.5. Summary**

Islamic banking needs proper capital regulations that take account of the nature of contracts engaged in. The existence of hybrid-based liabilities (a combination of sharing and fixed return contract) requires Islamic banks to enhance their repayment capabilities. The typical Islamic bank’s capital structure may also create systemic liabilities for the banking regulators in the case of financial distress. Such potential systemic liabilities may also have an adverse impact on the whole economic (financial) system.
In this chapter, I have reviewed possible approaches (using financial ratios) that can be adopted to enhance the banks' fiduciary and agency roles. In order to enhance their fiduciary role, I propose that prudent capital structure ratio be important along side a western-style capital adequacy ratio. The prudent capital structure ratio emphasises the importance of maintaining a balance of fixed claims on both the assets and liabilities sides. In order to enhance their agency role, I propose the use of a ratio to ensure a minimum level of financial participation by shareholders (as a proportion of the total equity-based financial sources of the bank). Analytically, I show that a higher level of financial participation by the bank's shareholders can be used to improve the quality of contracts entered into by investment depositors and shareholders. Sound risk assessment and asset valuation processes may also improve the quality of banking supervision.

The coverage of capital regulation should also include other supporting aspects, such as the supervisory review process and market discipline (i.e. Pillars 2 and 3) recommended in the new Basel Capital Accord. The main features that are believed to support an effective supervisory review process are: a sound risk management process; sound capital assessment; a comprehensive assessment of risks; an adequate system for monitoring and reporting risk; and adequate internal control review. The quest for better market discipline involves the imposition of 'core' disclosure requirements, which are designed to convey vital information to all the institutions crucial to the basic operation of market discipline.

Systemically, the existence of hybrid-based deposits may create potential liabilities to the banking regulator (government). The business uncertainty may create option value (to either continue with the bank or abandon) to the shareholders. The capital regulation should also provide efficient exit rules that optimise social welfare since inefficient closure policy may create an expensive bankruptcy costs.
Appendix 5.A
Mathematical simulation of capital adequacy using the AAOIFI’s standards

In simulating equation (3.1), we assume that $W_{OC+L}$ and $W_{PSIA^U}$ are equal to 100 percent (all the capital sources are used in the assets side). Under the AAOIFI’s approach,

$$CAR = \frac{OC}{W_{OC+L}(OC + L) + W_{PSIA^U}(0.5 * PSIA^U)}$$

Exhibit 5.A.1
Simulation process of capital regulation set by the AAOIFI

<table>
<thead>
<tr>
<th>SA/total dep.</th>
<th>PSIA^U/total dep.</th>
<th>OC/total dep.</th>
<th>SA/PSIA^U</th>
<th>OC/PSIA^U</th>
<th>TA/total dep.</th>
<th>PSIA^U/TA [%]</th>
<th>Rel. agency cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.99</td>
<td>0.01</td>
<td>0.0865</td>
<td>99.00</td>
<td>8.6522</td>
<td>1.0865</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>0.95</td>
<td>0.05</td>
<td>0.0848</td>
<td>90.00</td>
<td>1.957</td>
<td>1.0848</td>
<td>4.6</td>
<td>1.6</td>
</tr>
<tr>
<td>0.90</td>
<td>0.10</td>
<td>0.0826</td>
<td>90.00</td>
<td>0.8261</td>
<td>1.0826</td>
<td>9.2</td>
<td>2.2</td>
</tr>
<tr>
<td>0.85</td>
<td>0.15</td>
<td>0.0804</td>
<td>90.00</td>
<td>0.5362</td>
<td>1.0804</td>
<td>13.9</td>
<td>2.8</td>
</tr>
<tr>
<td>0.80</td>
<td>0.20</td>
<td>0.0783</td>
<td>90.00</td>
<td>0.3913</td>
<td>1.0783</td>
<td>18.5</td>
<td>3.4</td>
</tr>
<tr>
<td>0.75</td>
<td>0.25</td>
<td>0.0761</td>
<td>90.00</td>
<td>0.3043</td>
<td>1.0761</td>
<td>23.2</td>
<td>4.1</td>
</tr>
<tr>
<td>0.70</td>
<td>0.30</td>
<td>0.0739</td>
<td>90.00</td>
<td>0.2464</td>
<td>1.0739</td>
<td>27.9</td>
<td>4.8</td>
</tr>
<tr>
<td>0.65</td>
<td>0.35</td>
<td>0.0717</td>
<td>90.00</td>
<td>0.2060</td>
<td>1.0717</td>
<td>32.7</td>
<td>5.6</td>
</tr>
<tr>
<td>0.60</td>
<td>0.40</td>
<td>0.0696</td>
<td>90.00</td>
<td>0.1739</td>
<td>1.0696</td>
<td>37.4</td>
<td>6.3</td>
</tr>
<tr>
<td>0.55</td>
<td>0.45</td>
<td>0.0674</td>
<td>90.00</td>
<td>0.1498</td>
<td>1.0674</td>
<td>42.2</td>
<td>7.1</td>
</tr>
<tr>
<td>0.50</td>
<td>0.50</td>
<td>0.0652</td>
<td>90.00</td>
<td>0.1304</td>
<td>1.0652</td>
<td>46.9</td>
<td>8.0</td>
</tr>
<tr>
<td>0.45</td>
<td>0.55</td>
<td>0.0630</td>
<td>90.00</td>
<td>0.1146</td>
<td>1.0630</td>
<td>51.7</td>
<td>8.9</td>
</tr>
<tr>
<td>0.40</td>
<td>0.60</td>
<td>0.0609</td>
<td>90.00</td>
<td>0.1014</td>
<td>1.0609</td>
<td>56.6</td>
<td>9.8</td>
</tr>
<tr>
<td>0.35</td>
<td>0.65</td>
<td>0.0587</td>
<td>90.00</td>
<td>0.0903</td>
<td>1.0587</td>
<td>61.4</td>
<td>10.8</td>
</tr>
<tr>
<td>0.30</td>
<td>0.70</td>
<td>0.0565</td>
<td>90.00</td>
<td>0.0807</td>
<td>1.0565</td>
<td>66.3</td>
<td>11.8</td>
</tr>
<tr>
<td>0.25</td>
<td>0.75</td>
<td>0.0543</td>
<td>90.00</td>
<td>0.0725</td>
<td>1.0543</td>
<td>71.1</td>
<td>12.9</td>
</tr>
<tr>
<td>0.20</td>
<td>0.80</td>
<td>0.0522</td>
<td>90.00</td>
<td>0.0652</td>
<td>1.0522</td>
<td>76.0</td>
<td>14.0</td>
</tr>
<tr>
<td>0.15</td>
<td>0.85</td>
<td>0.0500</td>
<td>90.00</td>
<td>0.0588</td>
<td>1.0500</td>
<td>81.0</td>
<td>15.3</td>
</tr>
<tr>
<td>0.10</td>
<td>0.90</td>
<td>0.0478</td>
<td>90.00</td>
<td>0.0531</td>
<td>1.0478</td>
<td>85.9</td>
<td>16.5</td>
</tr>
<tr>
<td>0.05</td>
<td>0.95</td>
<td>0.0457</td>
<td>90.00</td>
<td>0.0481</td>
<td>1.0457</td>
<td>90.9</td>
<td>17.9</td>
</tr>
<tr>
<td>0.00</td>
<td>1.00</td>
<td>0.0435</td>
<td>90.00</td>
<td>0.0435</td>
<td>1.0435</td>
<td>95.8</td>
<td>19.4</td>
</tr>
</tbody>
</table>
By using a minimum CAR of 8% and simulating for different values of $PSIA^u$ and $SA$, we find $OC$. In the simulations, we keep the sum of $PSIA^u$ and $SA$ (i.e. equal to total deposits) equal to 1.

Relative agency cost is defined as the ratio of opportunity cost (expressed in a multiplicative factor) to the proportion of monetary surplus for the shareholders or

$$\left[\frac{OC}{OC + PSIA^u}\right]^{-1}$$. For example, agency cost in a bank, which has $PSIA^u$ equal to $OC$, will have agency cost twice as high as that of a bank, which has no $PSIA^u$. The shareholders in the latter bank will receive half of monetary surplus while they perform the same supervising function to the bank’s management (the multiplicative factor is $\left[\frac{1}{2}\right]^{-1}$ or 2.
Appendix 5.B
Stochastic effect in the analysis of shareholder value

In order to conduct a dynamic analysis of shareholder value within an Islamic bank, let us assume that the net worth of an Islamic bank is determined by a perpetual and certain cash flow generated at a constant expected rate by the assets. The bank faces business uncertainty, which is expressed in variance ($\sigma$), and is able to make choices over $\sigma \in [\sigma_1, \sigma_2]$. Mathematically, the net worth can be modeled in a geometric Brownian motion with drift, with time ($t$) being a continuous variable.

$$dN = (aE - d)dt + a\sigma dz$$

(B.1)

The bank is assumed to have a constant expected monetary surplus of $E$ per unit of time with a variance of monetary surplus of $\frac{1}{2}\sigma^2$; hence, the shareholders may expect monetary surplus of $aE$ per unit of time with a variance of $\frac{1}{2}a^2\sigma^2$. The shareholder value (which also represents the net worth of the bank) satisfies the ordinary differential equation$^1$:

$$\begin{align*}
(p + q)V &= \max_{d, \sigma}[d + (aE - d)N + \frac{1}{2}a^2\sigma^2V_{NN}] & \text{for } N < 0, \text{ and} \\
\rho V &= \max_{d, \sigma}[d + (aE - d)N + \frac{1}{2}a^2\sigma^2V_{NN}] & \text{for } N \geq 0
\end{align*}$$

(B.2)

$^1$ The differential equation adopts the Bellman equation for non-finite time horizon problem solving where there is no final value function from which we can work backwards. This problem solving equation applied for analyzing the moral hazard in the banking industry is also analyzed in Milne and Whalley (2001), and in Milne and Robertson (1996).
where $\rho$ represents the discount factor in the time horizon and $q$ represents a stochastic 'jump process'.

Applying proposition 1 of Milne and Robertson (1996), the optimal dividend policy takes the form that $\exists N^*$ subject to $d(N) = 0$ for $N < N^*$ and barrier control at $N = N^*$, where $0 < N < \infty$.

The argument for proposition 1; assuming that $r < \rho$ implies that a policy of never paying a dividend would result in $V = 0$.

\[
\lim_{T \to \infty} e^{-\rho T} \int_0^T \int_0^T d\tau < 0
\]

Optimal dividend policy is to retain all earnings in order to increase the survivability of the company, thus $V(N^*) = E / \rho$.

Some assumptions for pasting conditions at $N = 0$ and smoothing at $N^*$ are given by:

i. The sample path for $N = 0$ (liquidation threshold) is continuous.
ii. $V_N = 1$ at $N^*$. For $N \geq N^*$, the shareholder value is given by

\[
V(N) = V(N^*) + N - N^*
\]

iii. Therefore $V_{NN} = 0$ at $N^*$.

Applying proposition 2 of Milne and Robertson (1996) that for all values of $N$, $0 < N < N^*$, the boundary condition (i), (ii), (iii) and $V_{NNN} > 0$, $V_{NN} \leq 0$, and $V_N \geq 1$, the general solution satisfies the ordinary differential equations with boundary conditions:

\[
V(N) = A \exp(m_1 N) + B \exp(m_2 N)
\]
where \( m_1 \) and \( m_2 \) are the roots of \( \frac{1}{2} a^2 \sigma^2 m^2 + aEm - \rho = 0 \). The roots of the ordinary differential equation will be \( \frac{1}{a} \left[ \frac{-E \pm \sqrt{E^2 + 2\sigma^2 \rho}}{\sigma^2} \right] \).

Let us assume the general solution for \( N \leq 0 \) is given by:

\[
V = A \exp(m_1 N) + B \exp(m_2 N) \quad (i)
\]

The solution for \( 0 \leq N \leq N^* \) is given by:

\[
V = A \exp(m_1 N) + B \exp(m_2 N) \quad (ii)
\]

There are six boundary conditions to estimate the unknown parameters \( A, B, A', B' \) and \( N^* \).

At \( N^* \)

\[
V_{N^*} = m_1 A \exp(m_1 N^*) + m_2 B \exp(m_2 N^*) = 1 \quad (iii)
\]

\[
V_{NN} = m_1^2 A \exp(m_1 N^*) + m_2^2 B \exp(m_2 N^*) = 0 \quad (iv)
\]

At \( N^0 \)

\[
V^+ = V^- : \quad A \exp(m_1 N^0) + B \exp(m_2 N^0) = A \exp(m_1 N^0) + B \exp(m_2 N^0) \quad (v)
\]

\[
V_{N}^+ = V_{N}^- : \quad A \bar{m}_1 \exp(m_1 N^0) + B \bar{m}_2 \exp(m_2 N^0) = A \bar{m}_1 \exp(m_1 N^0) + B \bar{m}_2 \exp(m_2 N^0) \quad (vi)
\]

At \( N^{-\infty} \)

\[
V = A \exp(m_1 N^{-\infty}) + B \exp(m_2 N^{-\infty}) = 0 \quad (vii)
\]

Using the boundary conditions, we obtain the value of the unknown parameters of the general solutions. Applying \( N^0 = 0 \) at the boundary condition, we find the pasting condition between two general solution.

\[
\bar{A} + \bar{B} = A + B \quad (viii)
\]

\[
\bar{A} \bar{m}_1 + \bar{B} \bar{m}_2 = A \bar{m}_1 + B \bar{m}_2 \quad (ix)
\]
\[ \frac{A}{B} = \frac{\bar{m}_1 - m_2}{m_1 - m_i} \]  

Combining two smoothing conditions between \( N^0 \) and \( N^* \) we find the magnitude of the model,

\[ A = -\frac{m_2^2}{m_1^2} \exp((m_2 - m_1)N^*)B \]

\[ -\frac{m_2^2}{m_1^2} \exp((m_2 - m_1)N^*)Bm_1 \exp(m_1N^*) + Bm_2 \exp(m_2N^*) = 1 \]

\[ B = \exp(-m_2N^*) \frac{m_1}{m_2} (m_1 - m_2)^{-1} \]  

Similarly for another parameter, we find,

\[ B = -\frac{m_1^2}{m_2^2} \exp((m_1 - m_2)N^*)A \]

\[ -\frac{m_1^2}{m_2^2} \exp((m_1 - m_2)N^*)Am_2 \exp(m_2N^*) + Bm_1 \exp(m_1N^*) = 1 \]

\[ A = \exp(-m_1N^*) \frac{m_2}{m_1} (m_2 - m_1)^{-1} \]  

The critical value for zero-dividend threshold is given by:

\[ A = -\frac{m_2^2}{m_1^2} \exp(m_2 - m_1)N^* = -\frac{m_1 - m_2}{m_1 - m_i} \]

\[ N^* = (m_2 - m_1)^{-1} \ln \left[ \frac{m_1^2}{m_2^2} \left( \frac{\bar{m}_1 - m_2}{m_1 - m_i} \right) \right] \]  

183
Exhibit 5.B.1

Simulation result

<table>
<thead>
<tr>
<th>N</th>
<th>V</th>
<th>V_x</th>
<th>V_xx</th>
<th>-(V_x^2/V_e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.5</td>
<td>24.77</td>
<td>10.78</td>
<td>4.69</td>
<td>-0.44</td>
</tr>
<tr>
<td>-0.4</td>
<td>25.87</td>
<td>11.26</td>
<td>4.90</td>
<td>-0.44</td>
</tr>
<tr>
<td>-0.3</td>
<td>27.02</td>
<td>11.76</td>
<td>5.12</td>
<td>-0.44</td>
</tr>
<tr>
<td>-0.2</td>
<td>28.23</td>
<td>12.29</td>
<td>5.35</td>
<td>-0.44</td>
</tr>
<tr>
<td>-0.1</td>
<td>29.48</td>
<td>12.83</td>
<td>5.59</td>
<td>-0.44</td>
</tr>
<tr>
<td>0</td>
<td>30.79</td>
<td>13.40</td>
<td>-99.84</td>
<td>7.45</td>
</tr>
<tr>
<td>0.1</td>
<td>31.74</td>
<td>6.54</td>
<td>-44.71</td>
<td>6.84</td>
</tr>
<tr>
<td>0.2</td>
<td>32.22</td>
<td>3.47</td>
<td>-20.01</td>
<td>5.77</td>
</tr>
<tr>
<td>0.3</td>
<td>32.49</td>
<td>2.09</td>
<td>-8.95</td>
<td>4.27</td>
</tr>
<tr>
<td>0.4</td>
<td>32.67</td>
<td>1.48</td>
<td>-3.99</td>
<td>2.70</td>
</tr>
<tr>
<td>0.5</td>
<td>32.80</td>
<td>1.21</td>
<td>-1.77</td>
<td>1.47</td>
</tr>
<tr>
<td>0.6</td>
<td>32.91</td>
<td>1.06</td>
<td>-0.78</td>
<td>0.72</td>
</tr>
<tr>
<td>0.7</td>
<td>33.02</td>
<td>1.03</td>
<td>-0.33</td>
<td>0.32</td>
</tr>
<tr>
<td>0.8</td>
<td>33.12</td>
<td>1.01</td>
<td>-0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>0.9</td>
<td>33.22</td>
<td>1.00</td>
<td>-0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>1</td>
<td>33.32</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The shareholder value as a solution to the ordinary differential equations is illustrated in Exhibit 5.B.2.

Exhibit 5.B.2
Shareholder value as a function of the equity ratio

Parameter values are the same with those of Milne and Whalley (1998), setting E=1, \( \rho =0.03 \), N and V are expressed as multiple annual earnings, \( \sigma_1 =0.5 \) and \( \sigma_2 =1 \), and shareholder participation \( a_1 =1 \) and \( a_2 =0.5 \) and Poisson ratio \( q =0.5 \).
− (Vₓₓ / Vₓ) expresses the portfolio decision impacts on both expected returns and variance of the returns; thus, − (Vₓₓ / Vₓ) determines the mean-variance trade-off (Milne and Robertson, 1996).
Appendix 5.C

Financial participation in a sharing contract

The analysis explores the effect of financial participation by the bank’s shareholders on the quality of contracts. The analysis starts with the following assumptions:

i. The shareholders and the investment depositors share the monetary surplus in proportion to their financial shares \( E : f(OC, a(OC)) \).

ii. The investment depositors and the shareholders have strictly concave utility functions.

iii. The shareholders suffer from opportunity loss for any effort given to monitor the bank performance \( V(e) \), and if they invest the money somewhere else \( O_{OC}(OC) \).

iv. The investment depositors suffer from opportunity loss if they invest the money somewhere else \( O_{PSIAU}(EC - OC) \). [when \( EC \) equals to total equity-based capital]

Hence, we have the shareholders’ utility function \( U_{oc} : f(OC, a(OC), e(OC, a(OC))) \) and the \( PSIAU \) holders’ utility function \( U_{PSIAU} : f(OC, a(OC), e(OC, a(OC))) \). This analysis is inspired by Baldwin (2000). Let us assume that \( U_{OC} \) is determined by the shared monetary surplus \( \int_{E}^{\bar{E}} a(OC)Ef(E, e)dE \) minus agency cost \( V(e) \) and the opportunity cost of funds \( O_{OC}(OC) \), which is expressed in equation (C.1).

\[
\int_{E}^{\bar{E}} Ef(E, e)dE \text{ expresses the expected outcome as a function of } e \text{ and the density function of production uncertainty } E \in [\underline{E}, \bar{E}].
\]

\[
U_{OC} = \int_{E}^{\bar{E}} a(OC)Ef(E, e)dE - V(e) - O_{OC}(OC) \quad (C.1)
\]
Similarly, for the \( PSIA^U \), \( U_{PSIA^U} \) is determined by the shared monetary surplus and the opportunity cost of funds \( O_{PSIA^U} (PSIA^U) \), which is expressed in equation (C.2).

\[
U_{PSIA^U} = \int_E (1 - a(OC))Ef(E, e)dE - O_{PSIA^U} (EC - OC) \tag{C.2}
\]

According to Harris and Raviv (1978), Pareto improvement can be achieved if the agent’s expected utility can be increased without decreasing the expected utility of the other party. Assuming that the investment depositors are invariant to compensating changes in \( a(OC) \) and \( OC \), the total differentiation gives:

\[
\frac{\partial U_{PSIA^U}}{\partial OC} dOC + \frac{\partial U_{PSIA^U}}{\partial a} \frac{\partial a}{\partial OC} dOC = 0 \tag{C.3}
\]

Differentiating \( U_{OC} \) and \( U_{PSIA^U} \) with respect to \( a(OC) \) we have:

\[
\frac{\partial U_{OC}}{\partial a(OC)} = a'(OC)Ef(E, e)de
\]

\[
\frac{\partial U_{PSIA^U}}{\partial a(OC)} = -a'(OC)Ef(E, e)de
\]

Hence,

\[
\frac{\partial U_{OC}}{\partial a(OC)} = -\frac{\partial U_{PSIA^U}}{\partial a(OC)} \tag{C.4}
\]

Differentiating totally the shareholders utility function gives:

\[
dU_{OC} = \frac{\partial U_{OC}}{\partial OC} dOC + \frac{\partial U_{OC}}{\partial a} \frac{\partial a}{\partial OC} dOC + \frac{\partial U_{OC}}{\partial e} \left[ \frac{\partial e}{\partial a} \frac{\partial a}{\partial OC} + \frac{\partial e}{\partial OC} \right] dOC \tag{C.5}
\]
Combining the agent compensating condition (C.3) and (C.4) into the shareholders'/depositors’ utility for compensating changes in $a(OC)$ and $OC$ gives:

$$dU_{OC} = \left[ \frac{\partial U_{OC}}{\partial OC} + \frac{\partial U_{PSIA'}}{\partial OC} + \frac{\partial U_{OC}}{\partial a} \left[ \frac{\partial e}{\partial a} \frac{\partial a}{\partial OC} + \frac{\partial e}{\partial OC} \right] \right] dOC \tag{C.6}$$

The quality of the contract will be improved if $dU_{OC} > 0$ (if the $U_{PSIA'}$ utility function at least the same while the $OC$ improves (the changes is higher than 0), the contract is said to be improved). Substituting equation (C.3) and (C.4) into (C.6), we have:

$$\frac{\partial U_{PSIA'}}{\partial OC} + \frac{\partial U_{OC}}{\partial OC} = (O'_{PSIA'}(OC) - O'_{oc}(OC)) \tag{C.7}$$

Therefore,

$$[O'_{oc}(OC) - O'_{PSIA'}(OC)] \leq \frac{\partial U_{OC}}{\partial e} \left[ \frac{\partial e}{\partial a} \frac{\partial a}{\partial OC} + \frac{\partial e}{\partial OC} \right] \tag{C.8}$$

This means that the necessary condition for higher quality of contracts are:

[1] the utility must be positively correlated with effort,

[2] effort is positively correlated with profit share,

[3] profit share is positively correlated with financial participation, and

[4] marginal opportunity cost should be lower than the monetary surplus.
### Appendix 5.D

**Simulation of the proposed capital regulation**

In the simulation, we use a minimum CAR of 8% (equation 5.5) and a $\frac{OC}{PSIA^U}$ ratio of 6% to find the overall capital ratio requirement (i.e. the higher of the two). In the simulation, we keep the total value of $PSIA^U$ and $SA$ equal to 1.

#### Exhibit 5.D.1

**Simulation of proposed capital regulation**

<table>
<thead>
<tr>
<th>SA</th>
<th>PSIA^U</th>
<th>CAR^U</th>
<th>FP</th>
<th>The higher req. of CAR and FP</th>
<th>OC/TA</th>
<th>OC/PSIA^U</th>
<th>RelAgency Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sc1</td>
<td>Sc2</td>
<td>Sc3</td>
<td>Sc1</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>0.99</td>
<td>0.01</td>
<td>0.079</td>
<td>0.040</td>
<td>0.119</td>
<td>0.001</td>
<td>0.079</td>
<td>0.040</td>
</tr>
<tr>
<td>0.95</td>
<td>0.05</td>
<td>0.076</td>
<td>0.038</td>
<td>0.114</td>
<td>0.003</td>
<td>0.076</td>
<td>0.038</td>
</tr>
<tr>
<td>0.90</td>
<td>0.10</td>
<td>0.072</td>
<td>0.036</td>
<td>0.108</td>
<td>0.006</td>
<td>0.072</td>
<td>0.036</td>
</tr>
<tr>
<td>0.85</td>
<td>0.15</td>
<td>0.068</td>
<td>0.034</td>
<td>0.102</td>
<td>0.009</td>
<td>0.068</td>
<td>0.034</td>
</tr>
<tr>
<td>0.80</td>
<td>0.20</td>
<td>0.064</td>
<td>0.032</td>
<td>0.096</td>
<td>0.012</td>
<td>0.064</td>
<td>0.032</td>
</tr>
<tr>
<td>0.75</td>
<td>0.25</td>
<td>0.060</td>
<td>0.030</td>
<td>0.090</td>
<td>0.015</td>
<td>0.060</td>
<td>0.030</td>
</tr>
<tr>
<td>0.70</td>
<td>0.30</td>
<td>0.056</td>
<td>0.028</td>
<td>0.084</td>
<td>0.018</td>
<td>0.056</td>
<td>0.028</td>
</tr>
<tr>
<td>0.65</td>
<td>0.35</td>
<td>0.052</td>
<td>0.026</td>
<td>0.078</td>
<td>0.021</td>
<td>0.052</td>
<td>0.026</td>
</tr>
<tr>
<td>0.60</td>
<td>0.40</td>
<td>0.048</td>
<td>0.024</td>
<td>0.072</td>
<td>0.024</td>
<td>0.048</td>
<td>0.024</td>
</tr>
<tr>
<td>0.55</td>
<td>0.45</td>
<td>0.044</td>
<td>0.022</td>
<td>0.066</td>
<td>0.027</td>
<td>0.044</td>
<td>0.027</td>
</tr>
<tr>
<td>0.50</td>
<td>0.50</td>
<td>0.040</td>
<td>0.020</td>
<td>0.060</td>
<td>0.030</td>
<td>0.040</td>
<td>0.030</td>
</tr>
<tr>
<td>0.45</td>
<td>0.55</td>
<td>0.036</td>
<td>0.018</td>
<td>0.054</td>
<td>0.033</td>
<td>0.036</td>
<td>0.033</td>
</tr>
<tr>
<td>0.40</td>
<td>0.60</td>
<td>0.032</td>
<td>0.016</td>
<td>0.048</td>
<td>0.036</td>
<td>0.032</td>
<td>0.036</td>
</tr>
<tr>
<td>0.35</td>
<td>0.65</td>
<td>0.028</td>
<td>0.014</td>
<td>0.042</td>
<td>0.039</td>
<td>0.039</td>
<td>0.039</td>
</tr>
<tr>
<td>0.30</td>
<td>0.70</td>
<td>0.024</td>
<td>0.012</td>
<td>0.036</td>
<td>0.042</td>
<td>0.042</td>
<td>0.042</td>
</tr>
<tr>
<td>0.25</td>
<td>0.75</td>
<td>0.020</td>
<td>0.010</td>
<td>0.030</td>
<td>0.045</td>
<td>0.045</td>
<td>0.045</td>
</tr>
<tr>
<td>0.20</td>
<td>0.80</td>
<td>0.016</td>
<td>0.008</td>
<td>0.024</td>
<td>0.048</td>
<td>0.048</td>
<td>0.048</td>
</tr>
<tr>
<td>0.15</td>
<td>0.85</td>
<td>0.012</td>
<td>0.006</td>
<td>0.018</td>
<td>0.051</td>
<td>0.051</td>
<td>0.051</td>
</tr>
<tr>
<td>0.10</td>
<td>0.90</td>
<td>0.008</td>
<td>0.004</td>
<td>0.012</td>
<td>0.054</td>
<td>0.054</td>
<td>0.054</td>
</tr>
<tr>
<td>0.05</td>
<td>0.95</td>
<td>0.004</td>
<td>0.002</td>
<td>0.006</td>
<td>0.057</td>
<td>0.057</td>
<td>0.057</td>
</tr>
<tr>
<td>0.00</td>
<td>1.00</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.069</td>
<td>0.069</td>
<td>0.069</td>
</tr>
</tbody>
</table>

**Sc1:** Scenario 1 for average risk weight of 100%

**Sc2:** Scenario 1 for average risk weight of 50%

**Sc3:** Scenario 1 for average risk weight of 150%

**The higher requirement of CAR and FP:**

If the requirement set by the CAR is higher than the minimum requirement for financial participation, then the CAR is binding and vice versa.

---

189
Appendix 5.E

Stochastic effect in shareholder value under safety net arrangement

Applying Ito’s lemma to shareholder value in order to find the stochastic effect, partial differential equation will be as follow:

\[
Y_{Ut} = a \epsilon t - K_s D_t + g_s \mu_s \frac{\partial U_t}{\partial g_t} + D_t \mu_D \frac{\partial U_t}{\partial D_t} + g_t \mu_s \sigma_s \frac{\partial^2 U_t}{\partial g_t \partial D_t} 
\]

Manipulation the solution of the form \( U(g_t, D_t) = V(g_t / D_t) D_t \), we can find the homogenous differential equation as follow:

\[
(r - \mu_D) V(k_i) = (\alpha_s k_i - K_s) + (\mu_s - \mu_D) k_i V'(k_i) + \frac{\sigma_k^2 k_i^2 V''(k_i)}{2} \quad (E.2)
\]

The homogenous and unique solution of the differential equation (D.2) is represented as follow:

\[
V(k_i) = m(k_i) + n(k_i)
\]

\[
m(k_i) = A(k_i) \alpha_s + B(k_i) \mu_s
\]

\[
n(k_i) = C + D k_i
\]

\[
D = \frac{\alpha_s k_i}{(r - \mu_s)}
\]

\[
C = -\frac{K_i}{(r - \mu_D)}
\]
The complete solution of differential equation (D.2) is given by:

\[
V(k) = \left[ \frac{\alpha_s k_s}{(r - \mu_g)} - \frac{K_s}{(r - \mu_D)} \right] - \left[ \frac{\alpha_s k}{(r - \mu_g)} - \frac{K_s}{(r - \mu_D)} \right] \left( \frac{k_i}{k^*} \right)^4
\]  \hspace{1cm} \text{(E.3)}

The liability of the government is given by:

\[
L(k_i) = \left[ \frac{K_s - \xi_m}{(r - \mu_D)} \right] - \left[ \frac{\alpha_s k^*}{(r - \mu_g)} - \frac{K_s - \xi_m}{(r - \mu_D)} - c(k^*) \right] \left( \frac{k_i}{k^*} \right)^4
\]  \hspace{1cm} \text{(E.4)}

The minimum threshold for closing that maximise shareholder value is given by:

\[
k^* = \max \{ V(k) \}
\]

\[
\frac{\partial V(k)}{\partial k} = \frac{\partial}{\partial k} \left[ \frac{\alpha_s k_s}{(r - \mu_g)} - \frac{K_s}{(r - \mu_D)} \right] - \left[ \frac{\alpha_s k}{(r - \mu_g)} - \frac{K_s}{(r - \mu_D)} \right] \left( \frac{k_i}{k} \right)^4
\]  \hspace{1cm} \text{(E.5)}
CHAPTER 6
EMPIRICAL ANALYSIS OF ISLAMIC BANKING OPERATIONS
AS EXAMPLIFIED BY ONE INDONESIAN ISLAMIC BANK

6.1. Introduction

As explained in chapter 3, there has only been one Islamic bank in operation in Indonesia since 1992 until the government officially recognised Islamic banking at the end of 1998. The bank is one of the commercial banks which survived the severe economic turbulence during the period 1997 to 1999. This chapter analyses the financial characteristics of the bank on both the assets and liabilities sides (including the identification of the types of depositors existing with the bank), and assesses its operations from a prudential point of view. The analysis also includes an analysis of asset quality (i.e. assessing the expected losses of the fixed assets and modelling the variable returns), leading to capital adequacy assessment of the bank. This empirical analysis shows the practical relevance of the international standards to Islamic banking operations.

Most of the financial data used in the analysis is secondary data, which is collected from several sources. The first data source is the annual reports of the bank during the period 1993 to 2000. The second data source is the finance department of PT. BMI, which has provided information about commercial loans covering the period 1994 to 2000. The third data source is the savings department of PT. BMI, which has provided information about the bank’s savings (including rates of return paid). Other supplementary information was obtained through interviews with different layers of bank officers, including officers of the treasury and marketing departments. Secondary data, concerning indexes of the macro economy (including historical bank lending and

---

1 The data used comes courtesy of PT. Bank Muamalat Indonesia Tbk (PT. BMI).
2 The companies are not identified.
deposit rates, GDP per sector) was collected from the monetary and economic research
directorate (UREM), Bank Indonesia.

6.2. The building blocks

6.2.1. The surplus allocation scheme

The bank offers hybrid revenue-sharing contracts to give monetary incentives to the
savings depositors. Exhibit 6.1 shows the investment cash-flow process (and revenue
allocation) in the Islamic bank.

Exhibit 6.1
Investment cash-flow process for the Islamic bank

\[
SA_t^{FC} + EC_t
\]

\[
SA_t^{FC} = SA_{t-1}^{FC} + SA_{t-1}^{VC}
\]

\[
\lambda (R_t - SA_t^{FC}) \geq 0
\]

\[
(1 - \lambda) (R_t - SA_t^{FC}) - M_t
\]

Sources: Interviews with officers in the accounting department of PT.BMI

All sources of funds \((SA_t^{FC} \text{ and } EC_t)\) (1) are allocated into earning assets by the
management to produce returns \((R_t)\) (2). The returns from the individual earning assets
are reduced by the principal values \((SA_i^{FC})\) of the assets \((3)\). The reduced (positive) monetary surplus becomes the share base for the depositors \(\lambda(R_i - SA_i^{FC})\) \((4)\). The share base for the share-holders is also reduced to cover managerial expenses (i.e. overheads \((M_i)\)) \((5)\) before, finally, becoming monetary surplus for the shareholders \(((1-\lambda)(R_i - SA_i^{FC}) - M_i)\). On the liabilities side, the financial structure resembles the structure of western banks, except for the sharing of monetary surplus. This surplus allocation scheme shows clearly the adoption of hybrid contracts by the bank and risk-averse depositors. And, the monetary surplus is allocated before taking managerial and operational costs into account; therefore, it is unlikely that depositors receive zero returns. The priority of the revenue is to assure the repayment of the loan principal. Finally, the analysis above shows the dominance of fiduciary roles that should be conducted by the bank.

6.2.2. The liabilities side of the bank

Bank’s liabilities structure

The bank has been dominated by hybrid-type financial sources in its liabilities structure since mid-1995. The fixed claim liabilities \((SA^{FC})\) include ‘wadiah’ current accounts \((CA)\), savings deposits \((SD)\) and time deposits \((TD)\). The variable claim liabilities consist of profit share \((SA^{VC})\) of \(CA\), \(SD\), and \(TD\). As mentioned earlier, \(SA^{VC}\) will be transformed into \(SA^{FC}\) in every calculating period. Since the interval period is short (every month), operationally, \(SA^{VC}\) is not significant and does not appear in the bank’s financial position. Since neither restricted nor unrestricted investment deposits \((PSIA^R\) or \(PSIA^U)\) exist, the bank is effectively financed only by \(EC\) and \(SA^{FC}\). Exhibit 6.2 provides a further breakdown of the liabilities side of the bank.

---

3 The monetary surplus paid to the depositors will be added to the principal amount at the end of every calculating period. For example, one has saving deposits of amount 100. The monetary surplus paid by the bank is 10 (shared monetary surplus). In the next period, the total amount of the principal will be 110. Therefore, by the end of every calculating period, \(SA^{VC}\) will be reset to zero.
Exhibit 6.2
The bank’s liabilities structure: a further breakdown

<table>
<thead>
<tr>
<th>Products</th>
<th>Fixed claims</th>
<th>Variable claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SA^{EC}$</td>
<td>Fixed</td>
<td>-</td>
</tr>
<tr>
<td>$SA^{EC}, EC$</td>
<td>-</td>
<td>Sharing index is fixed</td>
</tr>
</tbody>
</table>

Exhibit 6.3 shows the ratio between equity capital ($EC$) and total liabilities ($TL$) of the bank during the period 1992 to 2000 (see Appendix 6.A for further details). The domination of equity based capital ($EC$) during the period 1992 to mid-1994 is because it had just started operations, hence the bank was in the ‘expansion’ period (the operations had not reached the ‘steady-state’ period).

Exhibit 6.3
The $EC$ to $TL$ ratio

Source: Annual reports of PT.BMI during period 1992 to 2000
Types of investors

As reviewed earlier, there are a number of possible types of investor who place their funds in an Islamic bank. There are investors who are concerned about the sharia rules and some who are not. There are also investors who are risk-takers and some who are risk-averse. All these possible types of investor are described in Exhibit 6.4.

Type I investors are common depositors that are risk-averse and are not religiously driven. They expect the highest deposit return possible without considering whether the monetary rewards come from Islamic banks or western banks. Type II investors are risk-takers and do not have any preference for sharia-based suppliers. They are willing to accept higher expected rates of return and even financial losses. Type III investors are religiously-driven depositors and risk averse, who are concerned about the sharia compliance of their income and their capital safety. Type IV investors are risk-takers but are still concerned about compliance with sharia rules.

Exhibit 6.4
Possible types of investor in Islamic banks

<table>
<thead>
<tr>
<th>Sharia orientation</th>
<th>Risk preference</th>
<th>The need for financial certainty</th>
<th>Types of depositors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-sharia minded</td>
<td>Risk averse</td>
<td>Principal and return are fixed. They will choose the highest return possible, either from Islamic banks or western banks.</td>
<td>Type I</td>
</tr>
<tr>
<td></td>
<td>Risk taking</td>
<td>Principal and return are not guaranteed. They will choose any possible investment that can give them the highest expected return possible.</td>
<td>Type II</td>
</tr>
<tr>
<td>Sharia minded</td>
<td>Risk averse</td>
<td>Principal is guaranteed, return is not guaranteed. They will stay in an Islamic bank as long as they don’t face losses.</td>
<td>Type III</td>
</tr>
<tr>
<td></td>
<td>Risk taking</td>
<td>Principal and return are not guaranteed. They will choose only the sharia-approved investments.</td>
<td>Type IV</td>
</tr>
</tbody>
</table>

The analysis aims to identify the types of investor who are likely to have stayed with the Islamic bank, although some characteristics, like the risk preference of the depositors, can be recognised by just looking at the details of the liabilities structure. Let us start by
analysing the returns paid by the Islamic bank. Since its establishment in 1992, the rates of return paid to depositors have never been higher than the rate of return paid by a western bank. Exhibit 6.5 shows how the rates of return differ, especially within the period 1998 to 1999\(^4\). The full line indicates the rate of return for a 1-month savings deposit in the Islamic bank and the dashed line indicates the average rate of return on 1-month savings deposits in western banks.

Based on the historical returns paid to the investors of the Islamic banks, it is unlikely that the Type I investors remained with the Islamic bank. Although providing the investors with fixed rates of return, the return paid was always lower than that paid by the western banks. Hence, the Islamic bank could not fulfil the needs of the Type I investors.

\[\text{Exhibit 6.5} \]
\[\text{Rates of return given by Islamic banks and conventional banks}\]

\[\text{Source: Bank Indonesia and PT. BMI, compiled}\]

---

\(^4\) The huge differential occurred as a result of the economic crisis in Indonesia. The government was trying to maintain the value of foreign exchange (preventing further capital flight) at a 'reasonable' rate, at the cost of a very high interest rate. At the same time, the fundamentals of the Indonesian economy were badly hit because of its dependency on imported capital goods. Most Indonesian firms were adversely effected, which was reflected in the general quality of the Indonesian banks' assets.
As mentioned earlier, a second set of evidence shows that investment depositors did not exist in the bank. The depositors were not prepared to face uncertainty side by side with the bank. It was found that all depositors placed their funds in savings/current accounts. Therefore, type II and type IV investors did not exist in the Islamic bank. This leaves only type III investors as possible long-term customers. However, in order to check if this was the case, there is a need to test the significance of the evidence. We have two hypotheses to fulfil:

**Hypothesis 1**: The investors do not care about the returns as long as they are still positive. Hence, the deposit growth would not be correlated with the interest rate differential, which reflects the opportunity loss for the depositors.

**Hypothesis 2**: The investors will withdraw their funds if there is a possibility of the return becoming negative. Hence, there will be a negative correlation between the deposit growth and the probability of financial losses accruing to the depositors.

Exhibit 6.6 shows the depositors' attitude towards the opportunity loss of saving in the Islamic bank. The full line indicates the deposit growth in the Islamic bank and the dashed line indicates the return differential between the Islamic bank and the western banks. The negative value of the return differential indicates the opportunity loss facing the depositors in the Islamic banks. The statistical test (in Exhibit 6.B.1, Appendix 6.B) shows that the investors who put their funds in savings deposits do not really care about opportunity loss.

---

5 The rewards for depositors are represented by revenue share indexes that are typical for each different term of deposit. The longer the term, the higher the revenue share index for depositors as a representation of higher risk premium.
Exhibit 6.6
Growth of depositors' funds and differential rates of return

They could have got higher returns if they had put their funds in the western banks, especially within the period of 1998 to 1999 when the return differential between the Islamic bank and western banks was extremely high. The coefficient of correlation between opportunity loss and growth of savings deposits is 0.095 (because it is near to zero, it means very weak correlation).

Exhibit 6.7
Probability of loss and level of deposit growth
The following analysis identifies the depositors' preference towards possible financial loss by the depositors as a result of possible bank closure without protection from a deposit insurance scheme. Deposit growth ($G_d$) is classified into three levels of growth: ‘high’ (denoted as 2, $G_d > 10\%$); ‘normal’ (denoted as 1, $0\% < G_d < 10\%$); and negative (denoted as 0, $G_d < 0\%$). The probability of loss is distinguished in three regions. It is defined as ‘high’ (denoted as 2, when there was an incidence of financial panic due to the closure of 16 commercial banks without deposit insurance protection); ‘moderate’ (denoted as 1, when most of the commercial banks’ assets were deteriorating significantly); and ‘low’ (denoted as 0, when the government announced a blanket guarantee scheme so that there was no possibility of depositors losing money). Exhibit 6.7 shows the relationship between the probability of incurring financial losses and the deposit growth of the bank. The statistical tests (see Exhibit 6.B.2, 6.B.3 and 6.B.4 in Appendix 6.B) show how the depositors were worried about their funds in the short period between end-1997 and early 1998. This is indicated by a high value of the Pearson Chi-Square that shows the significance of the probability of losses on deposit growth (with a negative correlation coefficient (-.713)). This confirms the second hypothesis for the whole period of the bank’s operations.

6.2.2. The assets side of the bank

**Assets structure**

The Islamic bank operates in a traditional way. Most of the operations involve giving loans and facilitating short-term trade-financing activities. The bank relies heavily on mark-up products. The general asset composition of the bank is described in Exhibit 6.8. This shows how the Islamic bank is not confident enough to apply pure PLS schemes. The borrowers are required to guarantee the repayment of the principal amount in full. Technically, the Islamic bank holds collateral to enhance the principal repayment. The borrowers are required to guarantee the repayment of the principal amount in full. Technically, the Islamic bank holds collateral to enhance the principal repayment. The

---

6 Karim (2000), reports that the bank is still in the phase of implementing small-scale pilot projects to observe how a pure PLS concept works in the Indonesian community. So far, he reports that the pilot projects are quite promising (i.e. delivering a high rate of return).
Islamic bank has also been conducting other financial activities, like currency trading and facilitating export/import activities. However, the volume of these activities has not been significant.

**Exhibit 6.8**

**General asset composition of the bank**

<table>
<thead>
<tr>
<th>Types of asset</th>
<th>Contract base</th>
<th>Share base</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non productive assets</td>
<td>-</td>
<td>-</td>
<td>Cash</td>
</tr>
<tr>
<td>Fixed return</td>
<td>-</td>
<td>-</td>
<td>Bank current account</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sharia based Treasury Bills</td>
</tr>
<tr>
<td>Hybrid types of contract</td>
<td>Revenue</td>
<td>-</td>
<td>Financing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Placements</td>
</tr>
<tr>
<td>Full sharing contracts</td>
<td>Revenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Profit and loss</td>
</tr>
</tbody>
</table>

Source: The annual financial reports of PT.BMI, compiled

**6.3. Prudential operations**

**6.3.1. Asset and liabilities structure**

As reviewed in chapter 5, a prudent assets and liabilities structure is very important for the operational sustainability of the Islamic bank. Exhibit 6.9 shows the ratio of fixed claim assets to fixed claim liabilities. The period between 1992 and mid-1994 indicates a transient condition (ratio of fixed claim assets to fixed claim liabilities was declining rapidly) before reaching a steady-state condition. The variable claim assets include financial participation in other banks and a very limited (e.g. in terms of pilot projects) amount of PLS-based projects. On the liabilities side, the variable claim part includes only equity-based capital. The analysis shows that the bank has never excessively used
pure-sharing types of contract on its assets side to balance the increasing existence of fixed claim liabilities; therefore, the interests of risk-averse depositors in the Islamic bank are always well served.

Exhibit 6.9
Ratio of fixed claim assets to fixed claim liabilities

![Chart showing ratio of fixed claim assets to fixed claim liabilities over years from 1992 to 1999.]

Sources: Annual financial reports of PT.BMI, compiled

6.3.2. Fixed claim asset quality assessment and capital adequacy

In conducting lending activities, all banks, including the Islamic bank studied here, are required to comply with sound lending practices to minimise credit risk. First, the Islamic bank is restricted to a legal lending limit regulation. The regulation is aimed at minimising concentration risk. Second, the bank is also required to assess the repayment capacity of the borrowers. This includes a continuous assessment of the borrowers' financial conditions and the value of the collateral taken. In this section, I would like to demonstrate how current statistical techniques are useful for evaluating the asset quality of the Islamic bank. The analysis of risk assessment emphasises the role of loans as the
dominant financial activity of the bank (see Exhibit 6.10 for the historical general asset composition of the bank and Appendix 6.C for more details).

Exhibit 6.10
Historical general asset composition of the bank

The fixed-claim type of assets of the Islamic bank comprises the mark-up based assets and the fixed-part of the hybrid type assets. The lending process for this type of asset is similar to the lending process of western banks. In order to quantify the financial risk inherent in the process, it is possible to adopt the approaches developed by the BIS (Basel Committee, 2001).

**Standardised (i.e. simple) Approach**

*Adjusted (eligible) capital base (ACB)*

The components of capital available - The bank has two elements of Tier-1 capital; ordinary paid up share capital and disclosed reserves. The bank has also only one element of Tier-2 capital; general loan loss reserves. During the period 1998 to 1999, the ACB of the bank eroded significantly. Illustration of the part played by equity
capital (paid up capital and profit/loss) in absorbing financial loss during the period mid-1997 to 1999 is provided in Exhibit 6.11. The financial losses resulted from the write-off of non-performing earning assets. The shareholders injected more paid-up capital to maintain a sound level of capital adequacy (the analysis of capital adequacy is conducted in the next section).

Exhibit 6.11
Capital structure and profit and loss

![Graph showing capital structure and profit and loss]

Sources: Annual financial reports of PT. BMI, compiled

Exhibit 6.12 shows the relationship between industrial production (service industry) and the performance of earning assets during the period 1992 to 2000. Industrial production is represented by the real GDP level, and the performance of earning assets is represented by the ratio of non-performing assets/loans to total assets. The non-performing loans are defined to include three loan categories: 'non-current'; 'doubtful'; and 'loss'. The NPLs are expressed in nominal terms. The dramatic economic recession (shown by the fall in the GDP level to minus 20 percent by end-1998) caused a major deterioration in the asset quality of the bank. This is explained as follows:
Exhibit 6.12
Percentage of non performing loans and the level of industrial production

The GDP level (in a particular industry area) shows the aggregate volume of business activities; the downturn in the GDP level indicates a lower level of business activity (and intuitively, profitability); and a lower level of profit earned may result in a higher level of credit problems (a higher percentage of NPLs).

Allowance for earning asset losses – The bank is required to establish allowance for earning asset losses in the forms of general provision and special provision to cover risks of losses. The general provision can be included as a component of Tier-2 ACB (subject to maximum amount of 1.25% of risk-weighted assets. The special provision is calculated from the loss probability of the loan classifications, which should be reported regularly by the bank. The trend for the allowance for earning asset losses is illustrated

---

7 Decree of the Board of Managing Directors of Bank Indonesia No. 31/148/KEP/DIR concerning Allowance for Earning Asset Losses.
8 The allowance is subject to standard provisions of 0%, 15%, 50% and 100% for the loan classifications current, non-current, doubtful and loss respectively.
in Exhibit 6.13. The increase in NPLs during the period mid-1997 to 2000 has required the bank to allocate a high level of reserves, as shown in Exhibit 6.13.

Exhibit 6.13
Allowance for earning asset losses

<table>
<thead>
<tr>
<th>Year</th>
<th>Allowance (Millions of Rupiahs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>0</td>
</tr>
<tr>
<td>1996</td>
<td>10,000</td>
</tr>
<tr>
<td>1997</td>
<td>20,000</td>
</tr>
<tr>
<td>1998</td>
<td>30,000</td>
</tr>
<tr>
<td>1999</td>
<td>40,000</td>
</tr>
</tbody>
</table>

Risk weights and risk weighted assets

The treatment of the debt-based liabilities in an Islamic bank is the same as that of the conventional banks. The risk weight on (acceptably) collateralised exposures will be subject to a floor of 20%. All the exposures (including the fixed claim part of the hybrid asset products) that are fully collateralised, will be subject to this floor. The loans that are guaranteed by unrecognised collateral will be subject to a 100% risk weight. The classification of the eligibility of the collateral is heavily related to the level of marketability necessary to allow a bank to meet its liquidity needs. Exhibit 6.14 shows the weighting value of each type of asset and the total RWAs of the bank in the period 1992 to 1999.
The sharp decrease of RWAs, between period mid-1997 to mid-1998, is a result of two aspects. First, an adverse economic condition has resulted in deterioration of asset quality and subsequently a high level of loan write-offs. Second, in such economic condition, the bank seemed to be quite reluctant to make new lending. Instead, the bank allocated more of its funding to buy central bank’s securities (i.e. similar with treasury bills (TBs) in the U.S.).

**Exhibit 6.14**

*(a) Risk weights*

<table>
<thead>
<tr>
<th>Types of asset</th>
<th>RW (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>0</td>
</tr>
<tr>
<td>Bank C/A</td>
<td>0</td>
</tr>
<tr>
<td>Treasury bills</td>
<td>0</td>
</tr>
<tr>
<td>CP</td>
<td>20</td>
</tr>
<tr>
<td>Trade financing</td>
<td>100</td>
</tr>
<tr>
<td>Leasing</td>
<td>100</td>
</tr>
<tr>
<td>Other financing</td>
<td>100</td>
</tr>
<tr>
<td>Placements</td>
<td>100</td>
</tr>
</tbody>
</table>

*(b) Risk weighted assets of the banks*

*Capital adequacy*

Based on the calculations for the ACB and RWAs above, it is possible to calculate the bank’s capital adequacy ratio during the period 1992 to 1999. The amount of equity capital paid in by the shareholders is subject to the BIS minimum requirement of 8% of the total of risk weighted assets. Exhibit 6.15 shows how the capital adequacy ratio fell below the minimum requirement of 8% in mid-1998, as a result of financial losses, but has since recovered.
The CAR of the bank was high in the early 90’s because the bank started its operation with a high paid-up capital. Along with the increase in fixed-claim deposits (SA), the proportion of its equity capital (EC) to risk-weighted assets (RWAs) decreased. In other words, the bank was in an expansion period.

**A possible use of an Internal Ratings Based (IRB) Approach in the future**

As an alternative to the standardised approach and subject to supervisory approval among other things, the bank may also adopt the IRB approach to calculate the capital adequacy ratio, which incorporates some significant internal as well as external variables in the calculation. The bank is required to fulfil a set of minimum preconditions before being able to use the IRB approach. Those requirements are outlined in the new Basel Capital Accord (BIS, 2001). This analysis is conducted to assess the feasibility of the bank adopting the IRB approach as an alternative to the standardised approach in assessing capital adequacy in the future. If the bank has not met the minimum requirements, this analysis can help in indicating what further steps the bank needs to take.
**Preconditions for adoption of the IRB approach**

In terms of exposures, the bank can still be categorised as a retail bank. Most of the exposures represent loans to individuals or small businesses, which are guaranteed by individuals. The bank has never made a loan to a corporate or been involved in large scale project-financing. In this analysis, I draw on minimum requirements applicable to retail exposures outlined in the new Basel Capital Accord (paragraphs 422 to 478). Exhibit 6.16 shows the variability of loan size of the bank’s exposures in 1999.

**Exhibit 6.16**

**Distribution of loan size during 1999**

![Distribution of loan size during 1999](image)

Source: Financing department of PT.BMI

**Segmentation** – The bank has three dominant product types: instalment loans, residential mortgages, and small business loans. The bank also segments its exposures by delinquency status.

**Completeness and integrity of rating assessment** – The bank has a dedicated team that, specifically, conduct monitoring activities on an ongoing basis to review the
performance of each individual loan. The performance of the loans is measured only by identifying the delinquency periods. For further improvement (i.e. to deliver a more accurate rating process), the bank could also complete the supporting information with other related information, such as external economic indicators and individual credit ratings.

**Oversight over the rating system and processes** – The bank has a procedure to approve the rating process on a monthly basis. The rating process is also reviewed annually by an external auditor as an integrated part of the annual reporting process.

**Criteria on orientation of the rating system** – The bank has a sufficient documentation system, although it is conducted on a paper basis (not electronically). Information about loans made, collateral and the borrowers is already available. However, in order to help senior management make business decisions more efficiently, the introduction of an electronic-data-base seems to be unavoidable. As mentioned earlier, the data coverage should also extend to a complete set of internal as well as external data.

**Requirements for estimation of EAD, and either (a) PD/LGD or (b) EL** – The bank has already recognised the probability of default for individual loan, in terms of loan classifications (based on delinquency periods). The new Basel Accord has also mentioned the possibility of using external data or statistical models for quantification providing a strong link between a bank’s basis of segmentation and its risk profile.

The analysis above shows that the bank is in a position to use the IRB approach as an alternative to the standardised methodology to calculate its capital adequacy ratio. Notwithstanding this, further improvements are still needed to secure a higher level of accuracy.
CHAPTER 6

EMPIRICAL ANALYSIS

Collateral and Loss Given Default
In the calculation of LGD, all exposure will be charged at 100% on the residual risks. The level of charge is chosen because all exposures are backed-up by non-liquid types of collateral/non-marketable fixed assets (i.e. the collateral value is not taken into account).

Probability of Default (PD)
An accurate assessment of the bank's financial condition is very useful to the bank as well as the supervisor as a measure of the bank’s soundness. According to the new Basel accord, the bank should regard internal data as the primary source of information for estimating loss characteristics. In addition to that, the bank is also permitted to use external data or statistical models that provide strong links between the bank’s basis of segmentation and its risk profile. The external data available is the industrial performances of the related sectors.

However, this data, which should be properly managed and monitored, is limited. It covers loan size, terms of contracts, industry performance, and the performance of the individual loan. Nevertheless, based on these variables, it is possible to conduct statistical tests to measure the significance of the variables in affecting the performance of the loans.

The hypothesis : The variables identified (terms of contracts, loan size and performance indexes of the related industries) have a significant statistical correlation with loan quality (credit migration). Credit migration expresses the probability of the loan quality of an asset moving from one status to another or otherwise remaining in the same status, within a certain period. As mentioned in the hypothesis, the migration process can be influenced by both internal and external factors. The first statistical test is conducted to find a possible
correlation between industrial performance indexes and credit migration. The results of the statistical test are given in Exhibit 6.D.1, Appendix 6.D. They show a significant correlation between industrial performance and credit migrations. A second statistical test is conducted to find any possible correlation between the terms of contracts and credit migration. The results of the statistical test are given in Exhibit 6.D.2, Appendix 6.D. They show an insignificant correlation between the terms of contracts and credit migration. A third statistical test is conducted to find possible correlation between loan size and credit migration. The results of the statistical test are given in Exhibit 6.D.3, Appendix 6.D. They show insignificant correlation between loan size and credit migration.

From these statistical tests, one is able to conclude that only the external variables (industrial performance indexes) are statistically related to loan quality (credit migration). The economic conditions, which are indicated by the economic variables, are a reflection of the actual economic activities. Intuitively, it can be understood that in an economic recession period, most economic activities are slowing down. The logical consequence is a downgrading of loan quality in the whole banking system. This statistical finding has consequences for the statistical modelling. The internal data, which should be the primary source of information for estimating loss characteristics according to the estimation requirements of the new Basel Accord, is no longer relevant. Therefore, there is less possibility of the bank using an IRB-approach for the calculation of capital adequacy.

In the absence of relevant internal data, the following analysis tries to construct a statistical model that explains the probability of credit migration as a function of industry performance. In this case, I use a logistic function (logit). The methodology for the statistical model is illustrated in Exhibit 6.17.

---

9 I use credit migration to represent the probability of deterioration or up-grade of the individual loan
Loans are classified into 4 categories. They are: 'current' (coll-1); 'non-current' (coll-2); 'doubtful' (coll-3); and 'loss' (coll-4). The credit migration expresses the probability of a loan migrating from one classification to another during a given period of time. Step 1 of the logit analysis calculates the probability of loan quality migrating to/remaining in the loan classification 'loss' (coll-4). Step 2 of the logit analysis calculates the probability of loan quality migrating to/remaining in the loan classification 'doubtful' (coll-3). Step 3 of the logit analysis calculates the probability of loan quality migrating to/remaining in the loan classification 'current' (coll-1) or 'non-current' (coll-2).

The regression analysis, showing the probabilities of credit migration, is illustrated in Exhibit 6.18\(^10\). Exhibit 6.18, section (a) shows the probability of coll-1 loans remaining in coll-1 (c1p1), or migrating to coll-2 (c1p2), or migrating to coll-3 (c1p3), or migrating to coll-4 (c1p4). Migration probabilities for coll-2, coll-3, and coll-4 are given in sections (b), (c), and (d) respectively. The credit migration probabilities provide estimates of the future composition of asset quality using the external data (industry performance). From the simulations, it can be seen that the poorer the industry performance, the higher the probability of the loan quality falling within the particular periods.

\(^10\) The regression process is conducted through E-View software package. For details, see Appendix 6.E.
Exhibit 6.18
Probability of credit migration as a function of industry performance
This credit migration probability matrix may be useful for both the banks and their supervisors in predicting future loan quality by observing not only the historical default events but also other ex-ante market signals. For the bank, this analysis may provide additional guidance for better portfolio diversification. For the bank supervisors, this analysis may provide additional guidance for assessing the risk-taking capacity of the banks in the future. Notwithstanding this, the analysis could be even more accurate if the bank could also provide more complete internal information and the statistical model was more comprehensive.

**Benchmark Risk Weight (BRW) and Risk Weighted Assets (RWAs)**

A BRW is the factor used to convert the probability of default into a risk weight. The probabilities of default are represented by \(c1p4\), \(c2p4\) and \(c3p4\). Based on the PD, which is calculated from the simulation of the credit migration, then the BRW can be calculated as follows:\(^\text{11}\)

\[
BRW(PD) = 976.5 * N(1.118 * G(PD) + 1.288) * (1 + 0.047 * (1 - PD) / PD^{0.44})
\]

---

\(^\text{11}\) Basle Committee, 2001, paragraph 426.
where $N(.)$ denotes the cumulative distribution function for a standard normal random variable and $G(.)$ denotes the inverse cumulative distribution function for a normal random variable.

The result of the calculation is given in Appendix 6.F and is illustrated in Exhibit 6.19 (a). The RWAs can also be calculated by using the formula below.

$$RWA = \frac{LGD}{50} \times BRW(PD) \quad \text{or} \quad 12.5 \times LGD,$$

whichever is smaller$^{12}$

The RWAs are given in Appendix 6.F and shown graphically in Exhibit 6.19 (b). Based on the calculation for RWAs and the bank’s eligible capital within the period 1995 to 1999, the Capital Adequacy Ratio (CAR) is illustrated in Exhibit 6.20. From the calculations, it can be concluded that during the economic recession, the risk weighted assets increased. This increase resulted in a lower CAR.

Exhibit 6.20
Capital Adequacy Ratio – IRB Approach

![Capital Adequacy Ratio Chart](chart.png)
6.3.3. Variable-claim types of asset and expected returns

In practice, there exist different types of projects, which are associated with different expected cash inflows and levels of uncertainty. Generally, Islamic banks may find three different types of projects to finance in sharing contracts, as illustrated in Exhibit 6.21. Scheduled-based project financing produces a lower level of risk since the monetary income is directly distributed from scheduled revenues (for example, construction projects which are financed by the government budget). Once the revenue shares are determined, the return will not be affected by external factors since the revenue shares are distributed prior to the realisation of profit. In determining the sharing ratio, the Islamic bank will determine a preferred level of expected income. Entrepreneurial investment projects produce a higher level of financial risk since monetary incomes distributed are still uncertain. The bank and the entrepreneur are only able to predict the expected revenue, which depends on many factors like market conditions and entrepreneurial skill. Deterioration in business conditions will reduce the expected cash inflow from the business activities. Islamic banks, as the capital providers, must have a minimum target for monetary surplus. This monetary target may be achieved by increasing its revenue share when the expected gross revenue is low, or by decreasing its revenue share when the expected gross revenue is high.

Exhibit 6.21
Three different types of sharing based financing

<table>
<thead>
<tr>
<th>Types of project to finance</th>
<th>Scheduled payment</th>
<th>Non-scheduled payments</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors to be concerned with</td>
<td>Capability to finish the project, validity of contract</td>
<td>Industrial analysis and qualitative individual skill analysis</td>
<td>Industrial and financial analysis</td>
</tr>
<tr>
<td>Purpose of financing</td>
<td>Project accomplishment</td>
<td>Business initiation</td>
<td>Working capital enhancement</td>
</tr>
<tr>
<td>Sources of uncertainty</td>
<td>Legal aspects and track record of the entrepreneur</td>
<td>Industrial performance and unobserved individual skill</td>
<td>Industrial and individual performance</td>
</tr>
</tbody>
</table>

Source: Interviews with the officers in marketing department, PT.BMI

The correlation pattern among gross revenue (nominal return) earned by the business (revenue) as a percentage of business revenue to the total loan, the sharing ratio and realised income for the bank (revenue share) as a percentage of the bank’s income to the total loan is illustrated in Exhibit 6.22. It shows the rate of gross revenue gained by the entrepreneurs (the dotted line), the average sharing ratio (the dashed line) and the rate of realised income for Islamic banks (the full line). Empirically, the correlation coefficient between the revenue share ratio and gross revenue is $-0.7393$. This coefficient shows the tendency of Islamic banks to adjust their revenue share contrariwise to business conditions.

Exhibit 6.22
Relationship between revenue, the sharing ratio and the revenue share

Source: PT. BMI

Model estimation of the expected return

The model estimation is constructed using the following assumptions. Firstly, historical individual performance determines the average return by the entrepreneur. Let $\hat{AD}$ be
the average difference between revenue \( (REV_t) \) and the industry performance index \((GDP_t)\); thus \( \tilde{AD} = \overline{REV_t} - \overline{GDP_t} \). After subtracting by GDP, we conduct statistical analysis to find possible statistical correlations between the variables.

The first statistical analysis shows a negative correlation (as shown in Exhibit 6.G.1, Appendix 6.G) between the share ratio and individual financial performance. This means that the more capable the individual, the higher the expected return will be. If the bank has a relatively constant expected return, it will require a lower sharing ratio. Contrariwise, if the projects generate a lower rate of returns, the bank will require a higher sharing ratio. The second statistical test also shows a negative correlation (as shown in Exhibit 6.G.2, Appendix 6.G) between the share ratio and industrial performance. It means that during a recession (a lower level of expected return), the bank will require its share ratio to increase in order to gain the same expected return as under normal economic conditions.

Based on the statistical analysis above, I conclude that the share ratio can be a function of both industry and individual performance. Secondly, the financial performance of every entrepreneur changes in accordance with the changes in industrial performance. Hence,

\[ \hat{REV} : f(\tilde{AD}, GDP) \]

The results of a regression process looking for a possible relationship between expected revenue and individual performance or industrial performance are given in Exhibit 6.G.3, Appendix 6.G. The statistical results are significant as indicated by the high \( R^2 \) level. Based on these statistical results, it can be concluded that the expected return of the bank is a function of industrial performance, individual performance and the share ratio \( (R : f(AD, GDP, \lambda(AD, GDP))) \).
Exhibit 6.23 shows the return and the estimated revenue of the bank as a function of individual performance, industry performance and the share ratio.

6.4. Summary

The types of depositors who are attached to the bank are religious and risk averse. They are not really worried about opportunity loss as a result of rate differentials between the Western and the Islamic banking systems as long as the expected returns do not become negative. In the absence of competition in the Islamic banking system, the bank was obviously not afraid of displacement risk since there were no Islamic competitors with which to compare the returns given to the depositors.

The Islamic bank can, however, benefit from the current development of statistical techniques in the assessment of asset quality. The bank can apply either a standardised approach or an IRB approach (if the quality of the operations meet the minimum requirements for the IRB approach) to assess its capital adequacy. From the analysis undertaken, it is clear that one of the factors that influenced its ability to survive the
economic down-turn was its financial cushion. The important role played by capital in absorbing shocks during a financial crisis has been clearly demonstrated.

In addition, it has been shown how further statistical innovation can also be implemented to help predict the expected return of the hybrid-based assets.
### Appendix 6.A

**Composition of the Islamic bank’s liabilities (%)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wadiah C/A</td>
<td>0.05</td>
<td>0.06</td>
<td>0.13</td>
<td>0.10</td>
<td>0.10</td>
<td>0.13</td>
<td>0.15</td>
<td>0.12</td>
</tr>
<tr>
<td>Saving Account</td>
<td>0.03</td>
<td>0.04</td>
<td>0.09</td>
<td>0.12</td>
<td>0.17</td>
<td>0.17</td>
<td>0.23</td>
<td>0.23</td>
</tr>
<tr>
<td>Dep. Account</td>
<td>0.09</td>
<td>0.15</td>
<td>0.32</td>
<td>0.46</td>
<td>0.50</td>
<td>0.49</td>
<td>0.49</td>
<td>0.45</td>
</tr>
<tr>
<td>Others</td>
<td>0.03</td>
<td>0.01</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Total Fixed Claims</strong></td>
<td>0.20</td>
<td>0.26</td>
<td>0.57</td>
<td>0.73</td>
<td>0.79</td>
<td>0.81</td>
<td>0.89</td>
<td>0.86</td>
</tr>
<tr>
<td>Paid-up capital</td>
<td>0.78</td>
<td>0.72</td>
<td>0.41</td>
<td>0.26</td>
<td>0.20</td>
<td>0.17</td>
<td>0.31</td>
<td>0.25</td>
</tr>
<tr>
<td>G. Prov</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.00</td>
<td>0.01</td>
<td>0.00</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Retained earning</td>
<td>0.02</td>
<td>0.03</td>
<td>0.02</td>
<td>0.01</td>
<td>0.00</td>
<td>0.01</td>
<td>(0.22)</td>
<td>(0.14)</td>
</tr>
<tr>
<td><strong>Total Variable Claims</strong></td>
<td>0.80</td>
<td>0.74</td>
<td>0.43</td>
<td>0.27</td>
<td>0.21</td>
<td>0.19</td>
<td>0.11</td>
<td>0.14</td>
</tr>
</tbody>
</table>
Appendix 6.B

Statistical test to identify the types of depositors attracted to the Islamic bank

Exhibit 6.B.1
Correlation between deposit growth and opportunity loss

<table>
<thead>
<tr>
<th></th>
<th>DGROWTH</th>
<th>OPPLOSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1.000</td>
<td>.095</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.667</td>
</tr>
<tr>
<td>Sum of Squares and Cross-products</td>
<td>1532.164</td>
<td>236.943</td>
</tr>
<tr>
<td>Covariance</td>
<td>69.644</td>
<td>10.770</td>
</tr>
<tr>
<td>N</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

Exhibit 6.B.2
Correlation between level of deposit growth and expectation of loss

LEVDGROW * PROBLOSS Crosstabulation

<table>
<thead>
<tr>
<th>LEVDGROW</th>
<th>PROBLOSS</th>
<th>1.00</th>
<th>2.00</th>
<th>3.00</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>.00</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>1.00</td>
<td>9</td>
<td>1</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>2.00</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>2</td>
<td></td>
<td>2</td>
<td>23</td>
</tr>
</tbody>
</table>
Exhibit 6.B.3

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>19.227a</td>
<td>4</td>
<td>.001</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>16.478</td>
<td>4</td>
<td>.002</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>11.181</td>
<td>1</td>
<td>.001</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 7 cells (77.8%) have expected count less than 5. The minimum expected count is .26.

Exhibit 6.B.4

Symmetric Measures

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Asymp. Std. Error^</th>
<th>Approx. r^</th>
<th>Approx. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval by Interval</td>
<td>Pearson's R</td>
<td>-.713</td>
<td>.089</td>
<td>-4.659</td>
</tr>
<tr>
<td>Ordinal by Ordinal</td>
<td>Spearman Correlation</td>
<td>-.642</td>
<td>.124</td>
<td>-3.835</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.
Appendix 6.C

General asset composition of the bank

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing</td>
<td>0.99</td>
<td>0.99</td>
<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
<td>0.91</td>
<td>0.85</td>
<td>0.59</td>
</tr>
<tr>
<td>Cash</td>
<td>0.01</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Cent. Bank Securities</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>0.07</td>
<td>0.12</td>
<td>0.36</td>
</tr>
</tbody>
</table>
Appendix 6.D

Correlation test between relevant factors to credit migration

Exhibit 6.D.1
Cross-tabulation and $\chi^2$ test of credit migration and industry performance index

<table>
<thead>
<tr>
<th>Credit Migration * Ind. Performance Crosstabulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Credit Deteriorated</td>
</tr>
<tr>
<td>Migration Remain</td>
</tr>
<tr>
<td>Upgraded</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>33.62.4</td>
<td>4</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>31.993</td>
<td>4</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>13.802</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>1068</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (0%) have expected count less than 5. The minimum expected count is 6.04.

Exhibit 6.D.2
Cross-tabulation and $\chi^2$ test for credit migration and terms of contracts

<table>
<thead>
<tr>
<th>Credit Migration * Terms of Loan Crosstabulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Credit Deteriorated</td>
</tr>
<tr>
<td>Migration Remain</td>
</tr>
<tr>
<td>Upgraded</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
EMPIRICAL ANALYSIS

CHAPTER 6

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>4.470a</td>
<td>2</td>
<td>.107</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>3.949</td>
<td>2</td>
<td>.139</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.222</td>
<td>1</td>
<td>.637</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>1068</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.66.

Exhibit 6.D.3

Cross-tabulation and $\chi^2$ test for credit migration and loan value

Credit Migration * Outstanding Loan Crosstabulation

<table>
<thead>
<tr>
<th>Count</th>
<th>Outstanding Loan</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small</td>
<td>Big</td>
</tr>
<tr>
<td>Credit Migration</td>
<td>Deteriorated</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Remain</td>
<td>393</td>
</tr>
<tr>
<td></td>
<td>Uprated</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>502</td>
</tr>
</tbody>
</table>

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>4.470a</td>
<td>2</td>
<td>.107</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>3.949</td>
<td>2</td>
<td>.139</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.222</td>
<td>1</td>
<td>.637</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>1068</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.66.
Appendix 6.E
Logistic Regression Results

CM1

123-4

LOGIT // Dependent Variable is NCOLL
Date: 11/11/00  Time: 21:48
Sample: 1 764
Included observations: 764
Convergence achieved after 6 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-4.548600</td>
<td>0.355388</td>
<td>-12.79898</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Log likelihood -44.43098
Obs with Dep=1 8
Obs with Dep=0 756
Variable Mean All Mean D=1 Mean D=0
C 1.000000 1.000000 1.000000

12-3

LOGIT // Dependent Variable is NCOLL
Date: 11/11/00  Time: 21:59
Sample: 1 756
Included observations: 756
Convergence achieved after 5 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-3.119055</td>
<td>0.180641</td>
<td>-17.26663</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Log likelihood -132.5068
Obs with Dep=1 32
Obs with Dep=0 724
Variable Mean All Mean D=1 Mean D=0
C 1.000000 1.000000 1.000000

1-2

LOGIT // Dependent Variable is NCOLL
Date: 11/11/00  Time: 22:04
Sample: 1 724
Included observations: 724
Convergence achieved after 4 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 6  EMPIRICAL ANALYSIS

C  -1.821809  0.131865  -13.81568  0.0000  
INDUSTRY  -0.063886  0.014716  -4.341340  0.0000  

Log likelihood  -239.1804  
Obs with Dep=1  78  
Obs with Dep=0  646  

Variable Mean All  Mean D=1  Mean D=0  
C  1.000000  1.000000  1.000000  
INDUSTRY  5.654972  2.617949  6.021672  

CM2

123-4  

LOGIT // Dependent Variable is NCOLL  
Date: 11/12/00  Time: 01:35  
Sample: 1112  
Included observations: 112  
Convergence achieved after 4 iterations  

Variable Coefficient  Std. Error  t-Statistic  Prob.  
C  -1.774090  0.274923  -6.453037  0.0000  
INDUSTRY  -0.045604  0.027343  -1.667853  0.0982  

Log likelihood  -44.60844  
Obs with Dep=1  16  
Obs with Dep=0  96  
Variable Mean All  Mean D=1  Mean D=0  
C  1.000000  1.000000  1.000000  
INDUSTRY  1.719643  -1.787500  2.304167  

12-3  

LOGIT // Dependent Variable is NCOLL  
Date: 11/12/00  Time: 01:42  
Sample: 96  
Included observations: 96  
Convergence achieved after 3 iterations  

Variable Coefficient  Std. Error  t-Statistic  Prob.  
C  -0.974394  0.237616  -4.100706  0.0001  
INDUSTRY  -0.043322  0.025503  -1.698664  0.0927  

Log likelihood  -53.64330  
Obs with Dep=1  25  
Obs with Dep=0  71  
Variable Mean All  Mean D=1  Mean D=0  
C  1.000000  1.000000  1.000000  
INDUSTRY  2.304167  -0.252000  3.204225  

229
### CM3

**123-4**

LOGIT // Dependent Variable is NCOLL  
Date: 11/12/00  Time: 01:59  
Sample: 1 93  
Included observations: 93  
Convergence achieved after 4 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDUSTRY</td>
<td>-0.101144</td>
<td>0.028721</td>
<td>-3.521616</td>
<td>0.0007</td>
</tr>
</tbody>
</table>

Log likelihood:  -57.32033
Obs with Dep=1:  35
Obs with Dep=0:  58
Variable Mean All | Mean D=1 | Mean D=0 |
INDUSTRY | 3.788172 | 0.791429 | 5.596552 |

### 12-3

**LOGIT // Dependent Variable is NCOLL**  
Date: 11/12/00  Time: 02:04  
Sample: 1 58  
Included observations: 58  
Convergence achieved after 3 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.452252</td>
<td>0.334936</td>
<td>4.335904</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Log likelihood:  -28.17191
Obs with Dep=1:  47
Obs with Dep=0:  11
Variable Mean All | Mean D=1 | Mean D=0 |
C | 1.000000 | 1.000000 | 1.000000 |

---

**230**
### 1-2

Logit // Dependent Variable is NCOLL  
Date: 11/12/00  Time: 02:08  
Sample: 1 11  
Included observations: 11  
Convergence achieved after 4 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-2.302585</td>
<td>1.048799</td>
<td>-2.195449</td>
<td>0.0528</td>
</tr>
</tbody>
</table>

Log likelihood: -3.350997  
Obs with Dep=1: 1  
Obs with Dep=0: 10  
Variable Mean All: Mean D=1: 1.00000  
C: 1.000000  
Mean D=0: 1.000000

### CM4

Logit // Dependent Variable is NCOLL  
Date: 11/12/00  Time: 02:14  
Sample: 1 100  
Included observations: 100  
Convergence achieved after 4 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2.313635</td>
<td>0.349425</td>
<td>6.621267</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Log likelihood: -30.25378  
Obs with Dep=1: 91  
Obs with Dep=0: 9  
Variable Mean All: Mean D=1: 1.00000  
C: 1.000000  
Mean D=0: 1.000000

### 123-4

Logit // Dependent Variable is NCOLL  
Date: 11/12/00  Time: 08:20  
Sample: 1 9  
Included observations: 9  
Convergence achieved after 3 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDUSTRY</td>
<td>-0.072588</td>
<td>0.132714</td>
<td>-0.546949</td>
<td>0.5993</td>
</tr>
</tbody>
</table>

Log likelihood: -6.083913  
Obs with Dep=1: 5  
Obs with Dep=0: 4  
Variable Mean All: Mean D=1: 1.00000  
Mean D=0: 1.00000
CHAPTER 6

EMPIRICAL ANALYSIS

INDUSTRY 0.777778 -0.160000 1.950000

1-2

LOGIT // Dependent Variable is NCOLL
Date: 11/12/00 Time: 08:25
Sample: 14
Included observations: 4
Convergence achieved after 3 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-1.098612</td>
<td>1.154700</td>
<td>-0.951426</td>
<td>0.4116</td>
</tr>
</tbody>
</table>

Log likelihood -2.249341
Obs with Dep=1 1
Obs with Dep=0 3

<table>
<thead>
<tr>
<th>Variable Mean All</th>
<th>Mean D=1</th>
<th>Mean D=0</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
</tbody>
</table>
## Appendix 6.F

The Calculation of Risk Weighted Assets using an IRB Approach

<table>
<thead>
<tr>
<th>Year</th>
<th>LGD</th>
<th>Probability</th>
<th>BRW</th>
<th>Adjusted RW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2.41</td>
<td>0.700</td>
<td>635</td>
<td>1,706</td>
</tr>
<tr>
<td>2</td>
<td>2.55</td>
<td>1,022</td>
<td>1,789</td>
<td>0.01</td>
</tr>
<tr>
<td>3</td>
<td>2.97</td>
<td>855</td>
<td>1,359</td>
<td>1,823</td>
</tr>
<tr>
<td>4</td>
<td>2.70</td>
<td>8,603</td>
<td>4,460</td>
<td>2,185</td>
</tr>
<tr>
<td>1996</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2.62</td>
<td>19,120</td>
<td>6,347</td>
<td>1,830</td>
</tr>
<tr>
<td>2</td>
<td>2.37</td>
<td>13,921</td>
<td>7,827</td>
<td>6,982</td>
</tr>
<tr>
<td>3</td>
<td>2.59</td>
<td>540</td>
<td>7,448</td>
<td>5,400</td>
</tr>
<tr>
<td>4</td>
<td>3.05</td>
<td>544</td>
<td>44</td>
<td>5,031</td>
</tr>
<tr>
<td>1997</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3.21</td>
<td>58,450</td>
<td>59</td>
<td>6,271</td>
</tr>
<tr>
<td>2</td>
<td>5.24</td>
<td>60,480</td>
<td>343</td>
<td>7,056</td>
</tr>
<tr>
<td>3</td>
<td>7.72</td>
<td>17,183</td>
<td>889</td>
<td>178</td>
</tr>
<tr>
<td>4</td>
<td>8.41</td>
<td>43,163</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1998</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5.39</td>
<td>147,797</td>
<td>217,376</td>
<td>152,555</td>
</tr>
<tr>
<td>2</td>
<td>6.12</td>
<td>97,920</td>
<td>122,400</td>
<td>153,840</td>
</tr>
<tr>
<td>3</td>
<td>5.55</td>
<td>65,530</td>
<td>201,060</td>
<td>0.01</td>
</tr>
<tr>
<td>4</td>
<td>126,914</td>
<td>63,779</td>
<td>7,333</td>
<td>257,899</td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>24,000</td>
<td>23,176</td>
<td>102,080</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>49,475</td>
<td>31,250</td>
<td>7,825</td>
<td>30,075</td>
</tr>
<tr>
<td>3</td>
<td>2,810</td>
<td>220</td>
<td>17,980</td>
<td>102,720</td>
</tr>
<tr>
<td>4</td>
<td>18,530</td>
<td>2,570</td>
<td>19,210</td>
<td>94,230</td>
</tr>
</tbody>
</table>
Appendix 6.G

Statistical model for estimating returns of variable return types of assets

Exhibit 6.G.1
Sharing ratio and individual performance

Correlations

<table>
<thead>
<tr>
<th></th>
<th>SHARERA</th>
<th>INDMDU</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHARERA</td>
<td>Pearson Correlation 1.000</td>
<td>-.488</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>INDMDU</td>
<td>Pearson Correlation -.488</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.108</td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Exhibit 6.G.2
Share ratio and industry performance

Correlations

<table>
<thead>
<tr>
<th></th>
<th>INDUSTRI</th>
<th>SHARERA</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDUSTRI</td>
<td>Pearson Correlation 1.000</td>
<td>-.607*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.036</td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>SHARERA</td>
<td>Pearson Correlation -.607*</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.036</td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).

Exhibit 6.G.3
Model estimation

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.977*</td>
<td>.955</td>
<td>.945</td>
<td>1.0984</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), INDIVIDU, INDUSTRI
b. Dependent Variable: RETURN
### ANOVA\(^b\)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>555.125</td>
<td>2</td>
<td>277.562</td>
<td>96.220</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>25.962</td>
<td>9</td>
<td>2.885</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>581.087</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Predictors: (Constant), INDIVIDU, INDUSTRI

\(^b\) Dependent Variable: RETURN

### Coefficients\(^a\)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>2.080</td>
<td>.856</td>
<td></td>
<td>.038</td>
<td></td>
</tr>
<tr>
<td>INDUSTRI</td>
<td>.481</td>
<td>.180</td>
<td>.207</td>
<td>.026</td>
<td>.818</td>
</tr>
<tr>
<td>INDIVIDU</td>
<td>.864</td>
<td>.077</td>
<td>.871</td>
<td>.000</td>
<td>.818</td>
</tr>
</tbody>
</table>

\(^a\) Dependent Variable: RETURN
CHAPTER 7

CONCLUSIONS

7.1. Summary of the Research and the Empirical Results

The aim of this thesis was to devise a regime of capital regulations that takes account of the characteristics of Islamic banks. One of the most distinguishing characteristics of Islamic banking operations is the prohibition of usury, and, consequently, the emphasis on sharing contracts (profit-and-loss (PLS)-sharing contracts). Therefore, the western system (and more established capital regulation, which is outlined by the Basel Committee on Banking Supervision – BIS, 2001) needs to be modified to reflect Islamic banking operations. To address this issue, the recently established institutions for Islamic banking regulations (e.g. the AAOIFI) have tried to propose a new capital standard that is appropriate for Islamic banks.

Before developing this new approach to capital regulation, the research was aimed at identifying the nature of sharing contracts and its applicability. This analysis is important to help explain the current reluctance of the players in Muslim society (including the Islamic banks) to apply pure PLS-based contracts in daily transactions. Practically, sharing contracts do not currently dominate either the assets or the liabilities side of Islamic banks.

Chapter 4 discusses the contract choices in terms of two objective functions: minimising risk (depending upon the risk aversion level) and maximising religious utility. The contracting parties will always try to maximise their utility subject to the level of certainty of the outcomes. The risk-averse player tends to choose a project with a higher level of certainty. In practice (especially in developing countries), information asymmetry may become very significant. There are four possible contractual problems identified. They are: unobservable effort (leading to moral hazard problems); hidden
productivity (leading to adverse selection problems); poor accounting standards; and price disparities (especially in the countries which allow two different types of banking system to operate). For the moral hazard and adverse selection problems, information and monitoring processes play important roles in reducing the intensity of the problems. Poor accounting standards may also create wrong incentives for the agent in maximising his own utility. This may lead to potential disputes among contracting parties, especially concerning the recognition of costs/expenses and revenues. The ability of entrepreneurs to choose the cheapest cost of capital may also create a possibility of the Islamic bank being crowded by marginally profitable projects. The Islamic banks, therefore, have to be equipped with skilled staff that are capable of choosing the ‘best’ prospective projects to be financed.

These potential problems are possible reasons for lower expected returns in share contracts. From the analysis, it is shown that the investor expecting a higher expected return from a project (stochastically dominant) may accept a wider range of possible incomes than if he expects a lower expected return. Finally, each individual (Muslim) shall optimise his utility subject to the expected monetary returns and religious compliance. In the absence of a sound economic environment, the religious and risk-averse customers will optimise the choice (for example, the religious depositors of Islamic banks expect the principal amount of their deposits to be guaranteed but they share the monetary surplus as a result of business activities). This analysis may explain the domination of hybrid-contracts (a combination between sharing and debt contracts) in Islamic banking operations.

In chapter 5, a more appropriate capital regulation for Islamic banks is developed. The analysis starts with the building blocks of the banking products, which can be classified into two general types: fixed claims; and variable claims. On the liabilities side, the existence of saving deposits that represent hybrid-contracts shows the need for enhancing repayment capacity by the Islamic banks since the principal amount of deposits is guaranteed. However, the composition of sharing-based and debt-based
deposits may vary among Islamic banks. The capital regulation should be able to enhance both the fiduciary as well as the agency role of the banks. The capital regulation outlined by the AAOIFI is flawed in two areas. First, there is a possibility that a bank will be allowed to operate with a high proportion of the PLS-based products on the assets side without being sufficiently backed by PLS-based products on the liabilities side. Second, the formula proposed for calculating the capital ratio may create a potential moral hazard problem when PLS-based depositors dominate the banks’ liabilities.

The analysis also provides a discussion of systemic stability when an Islamic banking system applies similar safety-net arrangements to maintain public confidence. The analysis adopts a stochastic methodology to represent uncertainty in the model. The analysis shows that the more dominant the debt-based deposits on the liabilities side of an Islamic bank, the higher the option value (to levy a higher systemic cost on the system) to the shareholders. The regulators of Islamic banks, like the regulators of western banks, should also be equipped with skilled staff to ensure an acceptable level of risk-taking is assumed by the banks.

The proposed capital regulation demonstrates how to enhance both the fiduciary as well as the agency roles of banks. The fiduciary role can be enhanced by requiring the Islamic banks: (1) to have prudent asset-liabilities (capital) structures; and (2) to have adequate financial cushions. The agency role can be enhanced by requiring: (1) the shareholders of Islamic banks to observe a minimum level of financial participation; and (2) the banks to disclose crucial financial information to investors. Theoretically, a higher level of financial participation and a higher quality of information will both improve the quality of the contracts entered into by the banks and their customers.

In chapter 6, the discussion is focused on an analysis of the financial characteristics and soundness of one Indonesian Islamic bank that survived the recent economic crisis in Indonesia. The analysis starts with a discussion of the bank’s capital and liabilities.
structure. This includes an identification of the depositor types that are likely to stay loyal to the Islamic bank. From the analysis, it is found that only religious and risk-averse types of depositors are likely to stay loyal to the bank. They do not really care about opportunity loss (higher returns are available from interest-based banks) as long as their principal is guaranteed. The analysis shows the need for an adequate financial cushion to help absorb temporary financial shocks. The analysis also shows the relevance of the banking standards recently outlined by the Basel Committee in maintaining the soundness of the bank's operations; and, the possible use of supporting statistical techniques in assessing asset quality is explored.

7.2. Recommendations for Future Research

This thesis emphasises the pivotal position of capital regulation of Islamic banks to help them to maintain their operational soundness. A more intensive discussion of other banking risks, such as market risk and liquidity risk, which Islamic banks face, and the methodologies available for identifying, measuring and controlling them, would be beneficial. This would improve our understanding of Islamic banking operations and shed light on the additional supervisory tools and regulations necessary to ensure the long run sustainability of the Islamic bank sector.
REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES

Discussion Series, Divisions of Research and Statistics and Monetary Affair, Federal Reserve Board, Washington, D.C.


248
REFERENCES


REFERENCES


