Stability of Islamic and Conventional banks, an empirical comparative analysis

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Advisor:

Jens Forssbaeck

Authors:

Muhammad Umar Islam

Shakhboz Kozokov

"The very objective of the Islamic Law is to promote the welfare of the people, which lies in safeguarding their faith, life, intellect, prosperity and wealth. Whatever ensures safeguarding of these five serves public interest and is desirable"

Al-Ghazali

Title:	Stability of Islamic and Conventional banks, an empirical comparative analysis
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Authors:	Muhammad Umar Islam Shakhboz Kozokov
Advisor:	Jens Forssbaeck
Key words:	Islamic Banking, Conventional Banking, Z-Score, Non Performing Loans/Assets, Ordinary Least Squares (OLS), Panel Regression.
Purpose:	The aim of this study is to investigate empirically the comparative stability of Islamic and Conventional banks for years 2005-08 to find out which one of them is more stable.
Methodology:	An initial overview of Islamic banking, its contracts, comparison with conventional banking and risks are provided to give the reader a qualitative overview of both banking systems. We have performed our quantitative analysis by employing two dependent risk proxies, four bank level and three country level control variables through panel and cross-sectional regression.
Theoretical Perspectives	Theoretical foundation is based upon previous analysis done on Islamic and Conventional banks by Cihak & Hesse (2008).
Empirical Foundation:	Based upon regression results of determinants (bank and country level control) on bank's operational and overall stability (risk).
Conclusion:	There are no statistically significant differences between Islamic and conventional banks' stability during the period 2005-08. The stability difference between Islamic and conventional banks is also not evident in financial crisis proxy year (2008).

-Stability of Islamic and Conventional Banks: an empirical comparative analysis-

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1 INTRODUCTION

In this chapter, the motives and inspiration behind the research topic are presented. Then the purpose is elaborated. The chapter ends with limitations of study and thesis outline.

1.1 Background

"During the past four decades Islamic financial institutions have evolved from mere concepts into fully fledged realities. And in recent years there has been a new dynamism as this fledgling financial industry has proved increasingly attractive, not only to the world's 1.6 billion Muslims but also to many others who are beginning to understand the unique aspects of Islamic finance. While the credit crunch creates turmoil throughout the global banking industry, the impact of certain risks and risk management strategies have been highlighted. The effects of taking excessive risks have led to horrendous banking losses for many, and have also emphasized the different philosophical approaches between Islamic and traditional or conventional western finance." (Timewell & DiVanna 2008)

From an early institutional establishment of Islamic banking[1] concept through first islamic bank (Dubai Islamic Bank UAE) in 1974, the number of Islamic financial institutions which are practicing forms of Sharia-compliant business[2]**,** has reached approximately 300 in over 75 countries (El Qorchi 2005). Total Assets of Islamic banks worldwide are estimated to be USD 250 billion and are expected to grow by 15 percent a year (Choong & Liu 2006; Ainley et al. 2007). However, still 60 percent of Islamic banks have less than USD 500 million in assets, which is considered to be minimum for Conventional banks[3]. Also, the total assets of Islamic banks are less than one single bank's assets in top 60 banks of the world (Greuning & Iqbal 2008).

While banks perform pivotal role in attracting investments and being guardian for them, analysis and evaluation of their business is important for identifying risks and managing

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[1] Islamic banking refers to system of banking which is consistent with Islamic law and guided by Islamic Economics

[2] Sharia-compliant business refers to business according to Islamic laws like prohibition of giving or taking interest at a fixed or predetermined rate, investment in highly uncertain or leveraged businesses or transactions, investment in tobacco or alcohol manufacturing companies etc.

[3] Conventional or Commercial banks referred in this study are those which are non-Islamic banks

them. The importance of studying comparative banking structure lies on its probable outcomes, since failure of any bank has more severe impacts on economy than failure of a manufacturing concern. Furthermore, the current credit crisis raised an interest of society more specifically of researchers, towards Islamic banking system as a new market niche, which has not been fully explored yet.

1.2 Previous Research

There are not many empirical studies available which compare Islamic and conventional banking. At present, the existing literature on Islamic banking and finance mainly focuses on to distinguish conceptual differences between conventional and Islamic banks (Ahmed 1981; Karsen 1982; Khan 1986) and very few studies have been done on risk analysis and performance of banks (Cihak & Hesse 2008; Grenuning & Iqbal 2008). The Research which tried to evaluate and analyze Islamic banking performance limited itself with rather narrow approach by exploring correlation between profitability and banking characteristics and analysis of descriptive statistics.

In his research Bashir (2001) used regression analysis by employing data variables in the Middle East. His study showed that profits of banks are generated through overhead, non-interest earning assets and customer short term funding. He argues that since Islamic banks are treated as shares (mutual funds), reserves held by banks propagates negative signs like reduced funds that available to future investments.

In another study Hassan (2005) applied Stochastic Frontier Approach and Data Envelopment Analysis to examine relative cost, profit, X-efficiency and productivity of Islamic banks worldwide. His results indicated that Islamic banks are profit efficient, with an average profit efficiency score of 84 percent under the profit efficiency frontier compared to 74 percent under the stochastic cost frontier.

In their study Moktar et al. (2006) discovered that the efficiency of the overall Islamic banking industry has increased during the period 1997-2003. Furthermore, they found that

the fully fledged Islamic banks were more efficient than the Islamic windows[4], but less efficient than the conventional banks. They concluded that Islamic windows of the foreign banks were more efficient than Islamic windows of the domestic banks. However this study only covered Malaysian banking system and cannot be generally applied.

Another research by Rosly et al. (2003) evaluated performance of Islamic and mainstream conventional banks in Malaysia in terms of financial ratios. Their research determined that Islamic banking scheme (IBS) banks have higher return on assets (ROA) as they can utilize existing overheads carried by mainstream banks. As this lowers their overhead expenses, it is found that the higher ROA ratio for IBS banks does not imply efficiency. Although, Islamic credit finance products may have complied with Islamic Law, their lack of ethical content is not expected to motivate IBS banks to strive for efficiency through scale and scope economies.

The research conducted by Cihak & Hesse (2008) applied Z-score analysis for finding stability (solvency) across Islamic and conventional banks. Their sample data included 520 observations for 77 fully fledged Islamic banks in 20 countries over the period 1993 to 2004. They subdivided their sample between small and large banks by having a threshold point of 1 billion USD. Their findings were that a) Small Islamic banks tend to be financially stronger than small commercial banks b) Large commercial banks tend to be financially stronger than large Islamic banks, and c) Small Islamic banks tend to be financially stronger than large Islamic banks.

Contrary to the scarcity of comparative research done on Islamic and conventional banks' stability and riskiness, a lot of cross country research on is available on conventional banks' stability. For instance Bongini et al. (2002) took banks active in the East Asian countries during the years 1996-98 and compared the performance of three sets of bank fragility indicators (computed from publicly available information like accounting data, stock prices and credit ratings) to assess bank fragility (financial distress). They concluded that overall, where the information processing is costly, as in most developing countries, it is important to

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[4] Islamic windows refers to designated Islamic banking branches opened by Conventional banks

use simultaneously a plurality of indicators to assess bank fragility. Gropp et al. (2006) analyzed the ability of distance to default and subordinated bond spreads to signal bank fragility in a sample of EU banks. They found that distance to default exhibits lead times of 6-18 months and bond spreads have signal value close to problems only. Further their results suggested complementarity between these two indicators. Another study on bank stability was done by Maechler et al. (2005). They identified financial risk indictors (credit risk, market risk, liquidity risk and foreign ownership) that affect banking stability in the new EU member states and surrounding countries. They found substantial variation in how various risks, macroeconomic environment and supervisory standards affect bank risk profile across different country clusters in the region. They concluded that credit risk emerges as one of the most important risk factors, especially when credit is expanding rapidly.

1.3 Purpose

The purpose of our study is to investigate the comparative stability [5](riskiness) of Islamic and conventional banks. To our knowledge, no cross-country empirical study has been done to capture the comparative stability of Islamic and conventional banks during the years (2005-08). This paper attempts to fill the gap in empirical literature on Islamic and conventional banks by using cross-country data for the years (2005-08). Additionally we want to examine the comparative stability of Islamic and conventional banks during financial crisis proxy year 2008. The current financial crisis has raised concerns, regarding the stability of financial institutions in this difficult time period. The failure and consequently nationalization of some of the world's big banks by respective governments (Table 6A, Appendix 6) highlights the issue of finding more resilient and reliable financing solutions. Also the promotion of Islamic banking in media became more prominent in current financial crisis, spreading information that they are more stable than conventional banks (Washington Post, The Banker, BBC etc.)[6].

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[5] The words 'Stability' and 'Riskiness' are used alternatively in this paper. For instance more stability implies less riskiness and vice versa. By definition stability means there is less possibility that the value of assets will become lower than the value of debt (bankruptcy) or that the bank will run out of capital and reserves and vice versa in case of riskiness.

[6] http://news.bbc.co.uk/2/hi/asia-pacific/7918129.stm
http://www.washingtonpost.com/wp-dyn/content/article/2008/10/30/AR2008103004434.html
The Banker, November 2008

1.4 Limitations

The major limitation is the time period (2005-08) that has been covered in this study. Since main source of our data are annual reports available on respective banks' website, collecting data about conventional banks is rather easy (due to properly established legal and accounting standards) but difficult for Islamic banks. Also, to give a clear picture regarding the performance of banks over the crisis period is difficult, since financial crisis became more severe in later 2008 and some banks have not yet published their annual report for 2008. For this lack of availability of data on crisis, we have simply considered 2008 as a proxy crisis year to check if banks' stability in this year is different from previous years.

Another matter of concern is that in some countries (e-g Pakistan), there is a recommendation from Central Bank that every conventional bank should have designated Islamic banking business. For that we have calculated conventional bank's Islamic banking income as a percentage of their total income. We found none of them greater than 10 % of their total income. Moreover, we have taken only fully fledged Islamic banks rather than banks which are semi-Islamic ones. Data limitations prevent us from taking into account every aspect of Islamic banks in detail, like distinguishing different types of investment accounts (deposit accounts). Our study does not designate to motivate or prove right or wrong, some particular type of banking or financing.

1.5 Thesis Outline

The structure of the paper has built in the following way. First Chapter is about introduction to the study. Chapter Two presents theoretical framework. It includes an overview of Islamic banking, its contracts, comparison of Islamic and conventional banking, risks associated to both banking systems and comparative stability. Chapter Three describes the methodology and data employed in this paper. More precisely, this chapter includes research approach, issues related to selection of variables and regression model. The results of the regression model are presented and discussed in Chapter Four. Chapter Five presents conclusion and proposals for further research. Additionally the development and present situation of Islamic banking in countries comprising our sample is presented in appendix 5. Moreover a presentation of the current economic crisis, its descriptive causes and consequences, and some comparative data with previous big banking crisis are given in Appendix 6.

2 THEORY

The nature of this study is comparative, hence a familiarity with Islamic banking and finance is necessary.This chapter presents the basics of Islamic banking, Islamic financial contracts, comparison of Islamic and conventional banking and an elaboration of risks specific to both banking systems.Finally a section is dedicated to discuss the comparative stability(riskiness) of Islamic and Conventional banks.

2.1 Introduction to Islamic Banking

Islamic banking refers to a system of banking or banking activity which is consistent with Islamic law and guided by Islamic economics. In particular, Islamic law prohibits the collection and payment of interest, also commonly called Riba in Islamic literature. Instead, Profit-Loss-Sharing arrangements (PLS) or purchase and resale of goods and services form the basis of contracts. In PLS modes, the rate of return on financial assets is not known or fixed prior to undertaking the transaction. Islamic law also generally prohibits trading in financial risk (which is seen as a form of gambling) and investing in businesses that are considered unethical such as businesses that make tobacco, alcohol or produce non-Islamic media. (Cihak & Hesse 2008)

Islamic banking and financial system exists to provide a variety of religiously acceptable financial services to Muslim communities. In addition to this special function, the banking and financial institutions, like all other aspects of Islamic society, are expected to "contribute richly to the achievement of the major socio-economic goals of Islam" (Chapra 1985). The most important of these are economic well-being with full employment and a high rate of economic growth, socioeconomic justice and an equitable distribution of income and wealth, stability in the value of money, and the mobilization and investment of savings for economic development in such a way that a just (profit sharing) return is ensured to all parties involved (Hassan & Lewis 2007). Like conventional banks, an Islamic bank is an intermediary and trustee of money of other people but the difference is that it shares profit and loss with its depositors. This difference that introduces the element of mutuality in Islamic banking makes its depositors as customers with some right of ownership in it (Dar & Presley 2000).

The word Islamic bank refers to banks which are involved in retail banking, wholesale banking, investment banking etc. There is no dilution between these types of banking services, while one bank can engage with all these businesses. Main source of funds are from deposits of customers. Typical operations of Islamic banks include profit and loss sharing agreements, leasing, purchase and resale transactions, venture investment etc. Islamic banks also deal with off-balance sheet operations like letter of credit, foreign exchange etc.

2.2 Islamic Financial Contracts

Islamic financial instruments are based on equity participation and risk sharing with both capital providers and borrowers. The basic terminology used in Islamic banking is given in Appendix 1. Some of the more prominent Islamic finance contracts are detailed as under.

Murabaha (Trade with mark up or cost plus sale)

The Murabaha is kind of contract where bank buys product from the provider of goods and resells it to debtor (purchaser). Though Murabaha contract is signed by two sides: bank and debtor (purchaser), there are three parties actually engaged in this contract: bank's debtor (purchaser) who can be person or company, the seller of goods who can be the manufacturer or trader and the bank who plays the role of intermediary trader between the purchaser and the seller. In Murabaha contract bank purchases the product from the seller and after adding pre-agreed profit, resells it to its debtor. One can argue that it involves interest while calling it pre-agreed profit, however in this case its ex-ante profit. The Murabaha contracts are widely used for financing real estate, industry machinery, consumer equipments etc. (Hassan & Lewis 2007)

Musharaka (Partnership or Joint-Venture)

In Musharaka contract the debtor or borrower of capital instead of asking e-g hundred percent financing by bank side, also contributes his/her own equity capital, even it can be one percent. The provider of capital is exposed to amount of capital committed by him/her and not like hundred percent, however the profits can be shared in predetermined ratios like 50/50 or 40/60 despite the fact that main capital provider contributes more. The Musharaka contract is used in financing imports to issue letter of credits. (Siddiqui 2008)

Modaraba (Profit and Loss Sharing)

Modaraba contracts are cornerstone of Islamic banking .In this contract one side provides full capital needed for a project while second one provides knowledge, skills and expertise and capital provider is exposed to all financial losses. One good example of Modaraba contract is the deposits in the bank. Modaraba contract will appear on both liability and asset side of balance sheets while on liability side as investment and asset side as project financings. The investor or depositor cannot require a guarantee against the risk. Investor (bank) also has the right to check business of partner through auditing or to give consultation for running it more successfully. At the end of project or time period entrepreneur who runs the project returns funds to investor and investor takes pre-agreed share in profit. During the project period entrepreneur can cover expenses not related to project either through other funds or taking separate interest-free loan from investor but he cannot use profit till the end of project. (Siddiqui 2008; Hassan & Lewis 2007)

Bay Bithaman Ajil (Credit Sales)

The cost plus profit (Murabaha) contract is hardly ever executed on spot through immediate payments by the purchaser. A spot payment of the full amount of the loan by the purchaser would mean that the bank loan is immediately paid off and the bank is simply performing the role of an intermediary trader facilitating the delivery of goods from seller to buyer and charging a profit mark up over cost for its middleman services. The financial intermediary role i.e. the traditional role of banks and money lenders for centuries can only be played by the bank if the loan payments are through installments or in other words the bank is extending credit (Hassan & Lewis 2007).

Salam (Sales Contract)

Salam is commodity contract in which delivery is in predetermined specification in due date. It's like future contracts in conventional banking. In Salam contract provider of capital gives funds to seller that he/she can utilize and began to cover his/her needs. At the time of delivery of goods bank can take the goods or authorize the seller to sell and pay debt or to deliver to third party with whom bank has agreement for transferring rights. The Salam sale is widely used in agriculture finance projects. (Greuning & Iqbal 2008)

Ijara (Leasing Contract)

Ijara contract is almost the same with conventional bank's leasing contract.

Qard-e- Hassana (Beneficiary or No Interest Loans)

Islamic banks engage with this type of loans because of strict social requirements from Sharia laws. This transaction have negative Net Present Value (NPV) for the banks, usually these types of loans are given to students and needy people. (Siddiqui 2008)

Sukuk (Islamic Bonds)

Generally Sukuk are asset-backed and tradeable Sharia compliant certificates. According to AAOIFI[7] Standard 17, "Investment Sukuk are certificates of equal value representing undivided shares in ownership of tangible assets, usufrict and services or in the ownership of assets of particular projects or special investment activity" (Hassan & Lewis 2007). Table 1 describes the differences between Sukuk and a Conventional bond

Table 1

(Comparison of Islamic and Conventional Bond)

Sukuk	Conventional Bond
Sukuk represents ownership stakes in existing and or/well defined assets	Bonds represent pure debt obligation due from this issuer.
The underlying contract for Sukuk issuance is permissible contract such as a lease or any of other.	In a bond, the core relationship is a loan of money, which implies a contract whose subject is purely earning money on money (Interest)
The underlying assets monetized in a Sukuk issuance must be Islamically permissible in both their nature and use e.g. a truck would always be an eligible asset but not its lease to a distillery	Bonds, can be issued to finance almost any purpose which is legal in its jurisdiction
The sale of a Sukuk represents a sale of a share of an asset	The sale of a bond is basically the sale of a debt
Asset-related expenses may attach to Sukuk Holders	Bond holders are not concerned with asset-related expenses

Source: (Mardam-Bey 2007)

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[7] Accounting and Auditing Organization for Islamic Financial Institutions

Takaful (Islamic Insurance)

The word Takaful literally means mutual or joint guarantee, which is practically used for understanding typical Islamic insurance, usually in forms of Modarabah where participants are agree to share their losses by contributing periodic premiums in the form of investments (Greuning & Iqbal 2008). Contrast to conventional type of life insurance Islamic laws prohibits making life insurance, while other insurance types have alternatives. (Hassan & Lewis 2007)

The financial statements of Islamic banks are organized on the basis of functionality. For example, Table 3 represents the balance sheet of a typical Islamic bank. On the assets side, most of the resources serve the bank only for liquidity purposes and they can't be invested in equity contracts, however bank can charge for that type of accounts while liabilities are in forms of investments in equity contracts. Furthermore the structure of individual balances may differ depending on business orientation, mission, county specificity etc.

Table 2
(Theoretical balance sheet of an Islamic bank based on functionality)

Assets	Liabilities
Cash balances	Demand deposits (amanah)
Financing assets (murabahah, salaam, Investment accounts (mudarabah) ijarah, istisnah)	Investment accounts (mudarabah)
Investment assets (mudarabah, musharakah)	Special investment accounts (mudarabah, musharakah)
Fee-based services (joalah, kifalah, and so forth)	Reserves
Non-banking assets (property)	Equity capital

Source: (Greuning & Iqbal 2008)

2.3 Comparison of Islamic and Conventional Banking

The difference between the conventional and Islamic banking system is that, in the conventional system interest is given (pre-promised) with a guarantee of repayment and a fixed percentage return. Conversely, in the Islamic system investors share a fixed percentage of profit or loss when it occurs i.e. the share of the two parties can vary according to the profit or loss achieved. Banks get back only a share of profit from the business to which it is a party and in case of loss, the business party loses none in terms of money but forgoes the reward for its activities during that period (AIBIM)[8]. An Islamic bank is essentially a partner with its depositors on one side and with entrepreneurs on the other side, when employing depositors' funds in productive direct investment as compared to a conventional bank which is basically a borrower and lender of funds. (Suleiman 2001)

Demand for sound corporate governance is higher in Islamic banking than conventional one. Usually depositors of Islamic banks are seen as investors in the company despite the fact that they do not participate in risk management, monitor and control management team like shareholders. Since depositors in Islamic banks are more exposed to risk than depositors in conventional banks, protection their rights requires efficient governance bodies for Islamic banks. Because of the peculiar contractual form of banking, corporate governance mechanisms for banks should encapsulate depositors as well as shareholders (Arun & Turner, 2003).

The corporate governance differences can be found in the form of Sharia boards in Islamic banks. The primary role of Sharia board is to ensure that business activities of a bank are complying with Islamic Law. Except Sharia board, other structures of corporate governance are almost the same like conventional banks. A typical governance structure of conventional and Islamic banks is depicted in Figure 1.

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[8]Association of Islamic Banking Institutions Malaysia

Figure1

(Stylized governance structures of conventional and Islamic banks)
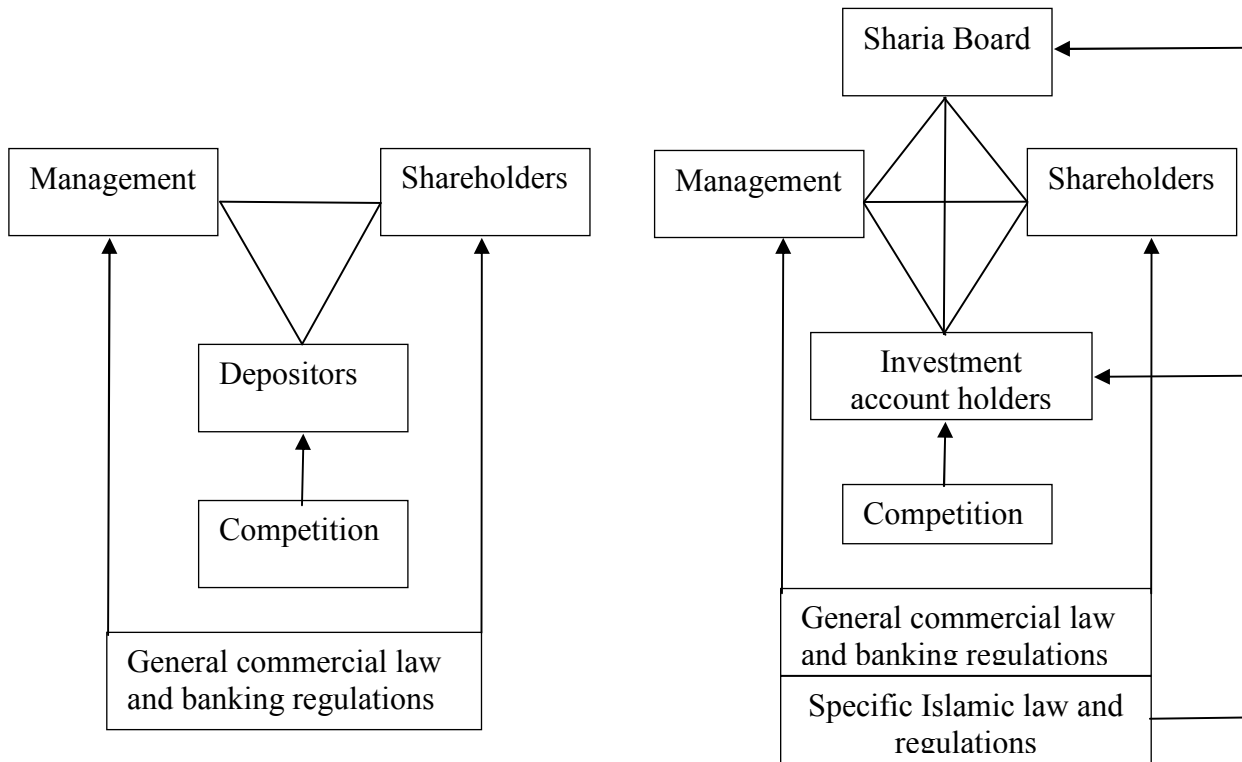
Source: (Hassan & Lewis 2007)

The responsibility of Sharia board for monitoring and screening doubtful businesses requires clarity of the role of Sharia board. Therefore, AAOIFI issued the governance standards of S*haria* board which include its appointment, composition and reports. According to that, Sharia board

a. Is an independent body of specialized jurists in *Fiqh Al Muamalat* (Islamic Commercial Jurisprudence)

b. Is entrusted with the duty of directing, reviewing and supervising the activities of the Islamic financial institutions in order to ensure that they are in compliance with Islamic *Sharia* rules and principles

c. Can issue *fatwa*[9] and rulings which shall be binding on the Islamic financial institution

d. Shall consist of at least three members who are appointed by the shareholders upon the

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[9] Religious edict or legal opinion of Muslim Scholar

recommendation of the board of directors (not including directors or significant shareholders of the Islamic financial institution)

e. Shall prepare a report on the compliance of all contracts, transactions and dealings with the *Sharia* rules and principles

f. Shall state that the allocation of profit and charging of losses related to investment accounts conform to the basis that has been approved by the Sharia Supervisory Board

g. Shareholders may authorize the board of directors to fix the remuneration of the *Sharia* Supervisory Board

Ahmad & Hassan (2007) discuss that Islamic banking system is required to be more social-environmental friendly than Conventional banking since Islamic banks have philosophical goals like integrating the moral values with economic activities, ability to provide credit to those who have talent, achieve harmony in society etc. As a part of their social responsibility policies Islamic banks often show Zakat[10] in their financial statements, which are payments for charitable purposes. Pressure from society and strictness of sharia board require Islamic banks to be engaged in social activities. Table 3 explains the philosophical differences between conventional and Islamic banking. For instance, from the viewpoint of business policy Conventional banks are set to maximize the shareholder's value as their main task and in contrast Islamic banks have dual targets: implementation of Islamic Law objectives and profit making. This implementation of Islamic laws (Shariah Compliance Risk) is difficult in different regulatory and competitive environments and could actually make Islamic banks more risky since keeping the confidence of depositors and investors is difficult due to Shariah Compliance Risk.

Table 3

(Fundamental differences between Islamic and conventional banking)

No	Islamic banking	Conventional banking
1	An advance step toward achievement of Islamic economics financial system	Part of the capitalistic interest-based
2	Islamic banking is committed to implement welfare-oriented Financing	No such commitment; extend oppression principles of and exploitation

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[10] Islamic terminology used for charity

3	The basis of business policy is socioeconomic uplifting of the disadvantaged groups of the society while having dual target: implementation of the objectives of *Sharia* and profit	Profit is the main target of business, or the duty is to maximize the shareholders' value
4	Prepare and implement investment plans to reduce the income inequality and wealth disparity between the rich and poor	It increases the gap since All plans are taken out for the rich
5	Interest and usury is avoided at all levels of financial transactions	The basis of all financial transactions is interest and high-level usury
6	Depositors bear the risk, no need for deposit insurance	Depositors do not bear any risk, moreover the bank is inclined to pay back principal with a guaranteed interest amount
7	The relationship between depositors and entrepreneurs is friendly and cooperative	Creditor–debtor relationship
8	Socially needed investment projects are considered	Projects below the fixed interest level are not considered
9	Islamic banks become partner in the business of the client after sanctioning the credit and bear loss	Do not bear any loss of client
10	Islamic bank can absorb any endogenous or exogenous shock	Cannot absorb any shock because of the ex ante commitment
11	Inter-bank transactions are on a profit and loss sharing basis	On interest basis and create unusual bubble in the market, i.e. exorbitant increase in the call money rate
12	Islamic banks work under the surveillance of the *Sharia* Supervisory Boards	No such surveillance
13	Lower rate of moral hazard problem because of the good relations between the bank and customers	High moral hazard problem because the relationship is based only on monetary Transactions
14	Avoids speculation-related financial activities	Main functions are speculation-related
15	Bank pays *zakat* on income and inspires clients to pay *zakat*, which ensures redistribution of income in favor of the poor	No *zakat* system for the benefit of the poor
16	Islamic banks sell and purchase foreign currency on a spot basis	Spot and forward are both used

Source: (Ahmad & Hassan 2007)

Ahmad & Hassan (2007) argue that Islamic bank depositors, as required by Islamic Law does not have any deposit insurance and normally bear the risk attached with PLS contracts in contrast to traditional banking. This leads depositors in Islamic banking more exposed to

losses since their investments are not insured and PLS losses of Islamic banks may be substantial which are transferred to depositors. Moreover this absence of deposit Insurance connected with PLS arrangements suggests that Islamic banks are more risky than Conventional banks since the absence of deposit insurance carries with it the risk of funds withdrawal i-e depositor can withdraw and shift the funds if a loss occurs. Hence, long term confidence of depositors plays major role in the development of Islamic banking.

Moreover, as the table two depicts, Inter-bank transactions in Islamic banking are settled in a PLS fashion, though we should not forget that the non availability of a proper inter-bank transactions may increase the liquidity risk of Islamic banks. The primary reason is the restriction of Islamic law in terms of adequate investment accounts and sale of debts when liquidity is needed.

Ahmad & Hassan (2007) argue that Islamic banks normally face less moral hazard problem since the relationships between the bank and depositors or investors go beyond only profit making and also due to the conservative nature of doing business (lending) in the absence of e-g deposit insurance etc. Also speculative behavior is a very important element that has to be avoided in all Islamic financial contracts. Prohibition of speculation allows contractual parties for avoiding high level of informational asymmetry and extreme payoffs in contracts while making parties more accountable for fulfillment of contractual duties and thus lower moral hazard problem. In terms of our empirical tests depicting lower Non Performing Loans/ Assets (Table 6) of Islamic banks as compared to Conventional ones, this would suggest Islamic banks are less risky.

2.4 Risks specific to Islamic and Conventional banking

While Islamic banking is becoming more prominent, the research on risk management within Islamic Finance is also increasing. Whereas Islamic banking is different from conventional banking in terms of nature of doing business, financial statements etc, these differences are not subject to treat them in different risk management frameworks. The principles and procedures for risk management are nearly similar in both banking systems. In their study Greuning & Iqbal (2008) argue that apart from common risks for banks (displaced commercial risk, withdrawal risk, governance risk, fiduciary risk, transparency risk, and reputational risk), Islamic banks have more specific risks e-g Sharia risk. These risks are detailed as under.

According to Accounting and Auditing Organization of Islamic Financial Institutions (AAOIFI) *Displaced Commercial Risk* is the risk when an Islamic bank is under pressure to pay its investor-depositor a rate of return higher than what should be payable under the "actual" terms of the investment contract. The bank can be in such condition when it underperforms during a period and is not able to generate enough profits for distribution to the investors and depositors.

The next risk is the *Risk of Withdrawal* which results from competitive pressures upon Islamic bank posed by other Islamic banks and conventional banks with Islamic Windows. An Islamic bank is subject to withdrawal risk when investors can withdraw funds if they receive lower rate of return, than they could earn elsewhere. If an Islamic bank works inefficiently and pay lower comparative returns, investors eventually will decide to move the funds, undermining franchises of cost of bank.

Governance Risk is associated with bad management i-e negligence in business dealing and satisfaction of contract obligations, weak internal and external institutional environments, including legal risks with which banks cannot provide observance to their contracts.

Fiduciary risk is the risk that stems from inability of banks to carry out business according to obvious and implicit standards as applicable to its fiduciary duties. Fiduciary risks lead to the

danger, standing a legal protection in case of infringement by bank of the fiduciary responsibility on investors and shareholders. As fiduciary agents, Islamic banks should operate in the best interests of investors and shareholders. When there is a contradiction between the purposes of investors or shareholders with bank actions, the bank is endangered to fiduciary risk.

Shariah risk is associated with structure and functioning of Sharia boards on institutional and systematic levels. This risk can be two types: the first one is because of non-standard methods concerning various contracts in various jurisdictions and second one is because failure to comply rules of Sharia. Distinctions in the interpretation of Sharia norms are a result of distinctions in the financial reporting, audit and book keeping. For example some scholars of Sharia consider Murabahah or Istisnah (see Appendix 1) contract obligatory for the buyer, and others assert that the buyer has possibility to refuse, even after placing of the order. Though various schools of thought to consider various methods are comprehensible, the bank faces the risk of nonbinding affairs and can lead to proceedings concerning unsettled transactions.

Legal risks requires more serious approach from risk management team of Islamic banks since most of the operations are based on trading and investing in equities, and not every legal system allows its banks to be engaged in these operations. Moreover, non-standardized contracts are also another costly activity for Islamic banks due to different approaches towards transactions.

The reputational risk, or "risk heading", is risk of that the trust of clients of bank can be damaged by irresponsible actions or behavior of a management.

Among all the risks mentioned above, Sharia risk is distinct and more related to Islamic banks since there are no Sharia boards in conventional banks. Risk behavior has many dimensions in Islamic banking, since one invests his/her money and then agrees to bear losses in case of unsuccessful realization of project. It's not allowed to transfer this risk to someone else. Since financial derivatives are prohibited, banks are not subject to be engaged

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in high volatile financial products. The risks faced by Islamic banks are rather complex than conventional banking. First, due to nature of business there are significant market risks exposing to Islamic banks along with credit risks. Second, risks are changeable from one kind to another at different stages of a transaction. For example, trade-based contracts (*Murabaha*, *Salam* and *Istisnaa*) and leasing are exposed to both credit and market risks. Third, because of rigidities and deficiencies in the infrastructure, institutions and instruments, the risks faced are magnified and/or difficult to mitigate (Hassan and Lewis 2007). Table 4 describes major risk faced by Islamic banking products.

Table 4

(Major risks faced by Islamic banking products)

Product based on	Major risks	Risk classification
Murabahah	Credit risk	Unsystematic
Musharakah	Market and agency risk	Systematic
Mudarabah	Market and agency risk	Systematic
Ijarah thumma al-bay'	Credit risk	Unsystematic
Ijara wa iktina	Operational and payment risk	Unsystematic
Salam	Delivery risk	Systematic
Istisna'	Delivery risk	Systematic
Bay' al-enah	Credit risk	Unsystematic
Tawarruq	Credit risk	Unsystematic
Commodity murabahah	Credit risk	Unsystematic

Source: (Rosly and Zaini 2008)

As can be seen from the table in Murabaha transactions Islamic banks are exposed by credit risks when the bank delivers the asset to the client but does not receive payment from the client on time. The same can be applied to Bay-al-Salam or Istisnah contracts. The customers can benefit by delaying payment knowingly that Islamic banks can not charge penalties for delaying. However, in some cases banks can use collateral as a security against credit risk. Since the risks are the main issue their categorization by level of importance is crucial for successive risk management. Table 5 elaborates the results of a conducted survey regarding the risk perception in different Islamic contracts.

Table 5

(Risk perception: Risks in different modes of financing)

	Credit risk	Market risk	Liquidity risk	Operational risk
Murabaha	3.47	2.75	2.62	2.8
Modaraba	3.38	3.56	2.57	2.92
Musharakah	3.71	3.67	3	3.08
Ijarah	2.64	3.17	3.1	2.9
Istisna	3.13	2.75	3	3.29
Salam	3.2	3.25	3.2	3.2

Note: The numbers in parentheses indicate the number of respondents; the scale is 1 to 5, with 1 indicating 'not serious' and 5 denoting 'critically serious'.

Source: (Hassan & Lewis 2007)

The table shows that credit risk is higher in Musharakah and lower in Modaraba contact. It seems the market risk is relatively higher in contracts i-e above than 3 points except in Murabaha and Istisna operations. The ranking of liquidity risk raises serious concern since banks find these contracts quite complex. Murabaha contracts are less risky in terms of liquidity risk while Istisna is most risky. Operational risk in all given contracts is almost the same. Similarly to conventional counterparts, Islamic banks are also exposed to typical treasure risks such as liquidity, market, rate of return, equity-investment risks. Market risks in Islamic banking are almost the same with conventional banking, except there is no interest rate risk. Moreover, Islamic banks are also exposed due to differences between actual and expected rate of return for investment account holders.

2.5 Comparative Stability (Riskiness)

After all this discussion, the central theoretical question arises that whether Islamic banks, operationally and overall are less or more stable (risky) than conventional banks? As literature on Islamic Finance has grown, there are various papers written in theoretical terms (with no empirical tests) for studying comparative riskiness in Islamic and Conventional banks, and their results are mixed. Researchers like Sundararajan & Errico (2002) Iqbal & Llewellyn (2002) and Cihak & Hesse (2008) etc. have a discussion on Islamic banks as being both more or less stable than Conventional banks at the same time by having arguments in the favour of both banking systems. They argue that following features need to be taken into

account when estimating comparative stability. Firstly the arguments suppporting that Islamic banks as being less stable (more risky) than Conventional banks, are presented.

- The Islamic PLS financing shifts the direct credit risk from banks to their investment depositors, but it also increases the overall degree of risk on the asset side of banks' balance sheets, as it makes Islamic banks vulnerable to risks normally borne by equity investors rather than holders of debt.

- Operational risk is crucial in Islamic finance. Operational risk is defined as the risk of losses resulting from inadequate or failed internal processes, people and systems or from external events, which includes but is not limited to, legal risk and Shariah compliance risk. The importance of operational risk in Islamic finance reflects the complexities associated with the administration of PLS modes, including the fact that Islamic banks often have limited legal means to control the agent-entrepreneur.

- PLS cannot be made dependent on collateral or guarantees to reduce credit risk.

- Product standardization is more difficult due to the multiplicity of potential financing methods, increasing operational risk and legal uncertainty in interpreting contracts.

- Islamic banks can use fewer risk-hedging instruments and techniques than conventional banks and traditionally have operated in environments with underdeveloped or nonexistent interbank and money markets and government securities, and with limited availability of and access to lender-of-last-resort facilities operated by central banks. However, the significance of these differences has decreased due to recent developments in Islamic money market instruments and Islamic lender-of-last-resort modes and the implicit commitment to provide liquidity support to all banks during exceptional circumstances in most countries.

- Another specific risk inherent in Islamic banks stems from the special nature of investment deposits, whose capital value and rate of return are not guaranteed. Some

of the authors quoted above argue that this increases the potential for moral hazard, and creates an incentive for risk taking and for operating financial institutions without adequate capital.

Contrary to those above points, there are several features that could actually make Islamic banks more stable (less risky) than conventional banks. These are detailed as under.

- Islamic banks are able to pass through a negative shock on the asset side (e.g., a Musharaka loss) to the investment depositors (a Mudaraba arrangement). The risk-sharing arrangements on the deposit side provide another layer of protection to the bank, in addition to its book capital.

- The need to provide stable and competitive return to investors, the shareholders' responsibility for negligence or misconduct (operational risk), and the more difficult access to liquidity put pressures on Islamic banks to be more conservative (resulting in less moral hazard and risk taking). Furthermore, because investors (depositors) share in the risks (and typically do not have deposit insurance), they have more incentives to exercise tight oversight over bank management.

- Islamic banks have traditionally been holding a comparatively larger proportion of their assets than commercial banks in reserve accounts with central banks or in correspondent accounts. So, even if Islamic investments are more risky than conventional investments, the question from the financial stability perspective is whether or not these higher risks are compensated for by higher buffers.

Therefore examining all these points from the existing literature, it is very difficult to provide a definitive clear-cut answer that which banking system is theoretically more stable and this has also been quoted by (Cihak & Hesse 2008). One possible reason for this is that Islamic banks are still in phase of shaping themselves to operate in a thorough Shariah-complaint fashion and to be able to establish themselves distinctly different from conventional banks. Choong & Liu (2006) stated this in their study on Islamic banks in Malaysia. They concluded that Islamic banking as practiced in Malaysia deviates from the basic PLS paradigm and

should not be considered very different from conventional banking. But this can be a minority opinion and the situation can be different in other countries. Accordingly it is possible to determine empirically whether Islamic banks are more or less stable (risky) than Conventional banks by taking accounting data into account and this is exactly the aim of our study.

3 METHODOLOGY AND DATA

> In this chapter, research approach and issues related to data are elaborated. Furthur we present and motivate the choice of risk proxies, control variables and regression analysis.

3.1 Research Approach

The aim of this study is to examine the stability (riskiness) of Islamic and conventional banks, so a deductive approach, which is also called "top-down" approach (Bryman & Bell 2003) is chosen. In order to give a clearer picture of Islamic banks compared to conventional ones, both qualitative and quantitative techniques used. While former one discusses theoretical differences between two distinct banking systems, the latter one takes accounting data to draw conclusions. The combination of these two methodologies makes it clearer to observe the stability (risk) differences between these two distinct entities. We have based mostly this study on the previous research done by International Monetary Fund (Cihak & Hesse 2008). We did this because of the nature of this study and scarcity of the empirical comparative research available in this area.

3.2 Data Collection

This study relies entirely on secondary data, because of large geographical area covered and short time period for research involved. The source of firm level data is published annual reports of banks available on the respective websites. The additional country level data has been retrieved from World Development Indicators, CIA Fact Book and Economist Intelligence Unit (EIU Views Wire).

3.2.1 Selection Criteria

There are many institutions dedicated towards groundwork, research and promotion of Islamic Finance, e-g IIBI[11], IIIBF[12], and IBNI[13] etc. These institutions publish lists of fully fledged Islamic banks and other Islamic Financial Institutions on their websites. These are trusted and quoted sources on Islamic banking and finance e-g by Cihak & Hesse (2008). However an issue of concern is that neither of these lists covers the full range of Islamic

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[11] Institute of Islamic Banking and Insurance   http://www.islamic-banking.com/ibanking/ifi_list.php
[12] International Institute of Islamic Business and Finance   http://iiibf.org/bank.html
[13] Islamic Banking Network International http://www.islamicbankingnetwork.com/index.shtml

banks available worldwide. Our selection of Islamic banks was primarily from these lists while having at least two years of accounting data available between years 2005-08. We found 16 banks from these lists for which at least 2 years data was available. Additionally we consulted the country wise lists of Islamic banks published by respective central banks and other financial services authorities. We selected 10 Islamic banks by this way. For all 26 Islamic banks, we read their website and annual report to cross check that they are fully fledged Islamic banks. Data collection for conventional banks was rather easy (a mature industry with properly established legal and accounting standards) while difficult for Islamic banks: therefore we tried to include as much Islamic banks as possible.

For conventional banks we selected randomly between big and small banks from the lists, which are available on respective websites of government authorities like central bank, monetary agencies and Financial Services Authorities. We tried to include a handful of conventional banks so that is useful for empirical analysis with the same criteria for having at least two years of accounting data available .

Furthermore, depending upon availability and resources, we have used both consolidated and unconsolidated financial statements for our analysis[14]. About 65% of all observations are unconsolidated ones. Our choice of consolidated and unconsolidated financial statements is also consistent with Cihak & Hesse (2008)[15]. This shows our study is reliable to the extent of usage of consolidated and unconsolidated financial statements as used in previous research. More information about consolidated and unconsolidated data breakdown is provided in Appendix 2C.

3.2.2 Sample

The sample includes 66 banks from 8 banking systems, out of which, 26 Islamic and 40 conventional banks. The sample does not cover the full range of Islamic and Conventional banks worldwide; instead it's a fair representation of both banking systems in 8 countries

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[14] An ideal would have been to use all unconsolidated financial statements, but depending upon time and resources available (the unavailability of the centralized Bankscope database) we had no other choice than to use consolidated and unconsolidated financial statements.

[15] Cihak & Hesse (2008) used Bank Scope database (a database of banks worldwide) for their analysis and they also found about 1/3 of all relevent observations in that database to be consolidated ones.

where Islamic banking has a non-negligible presence. Our sample covers banks for the period 2005-08, in the following territories: Bahrain, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, Pakistan, Malaysia, and United Kingdom. We have up to 104 observations for Islamic and 160 for conventional banks. More information about country wide banks and observations for specific variables is provided in Appendix 2A and 2B. Additionally the development and present situation of Islamic Banking and Finance in the above mentioned countries are provided in appendix 5.

3.2.3 Excluded Observations (Outliers)

We had outliers for some variables in our sample. As an example, x-y scatter for dependent variables (risk proxies) is presented.

Figure 2

(Sample Outliers)
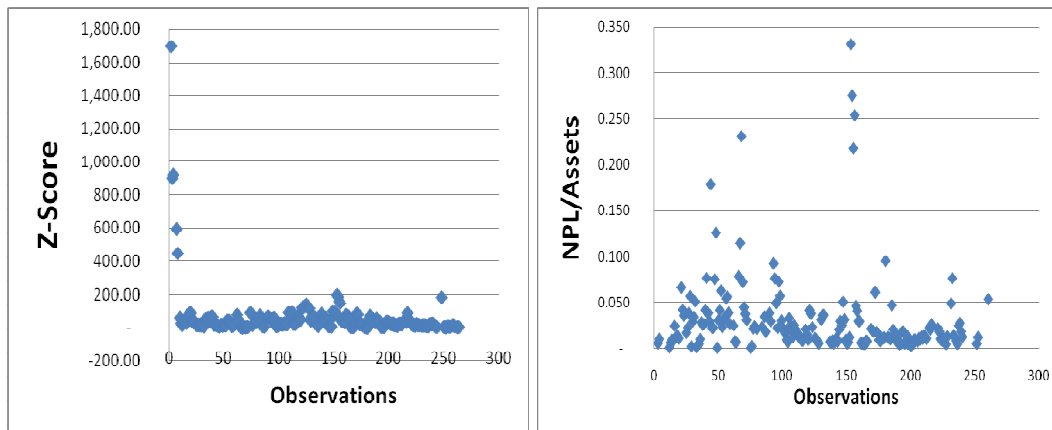
For treatment of outliers, we used Grubbs test (Grubbs 1969). Grubbs test is defined as

$$Z = (Mean - Value)/\text{SD}$$

Where Mean, SD are the mean and standard deviation of the sample respectively. Value is the individual observation. We have set the tolerance level (resultant) to 5, so that to only exclude those observations which are extremely away from the mean. We did this because otherwise our sample would have been reduced to a greater extent.

3.3 Specifying Bank Stability (Riskiness)

Forssbaeck (2008a, Table B1) provides a detailed list of different market and accounting based risk proxies used in banking research. Our choice of variables depended upon

comparability and reliability between Islamic and conventional banks, because some accounting measures might be considered different among them, e-g leverage. Possible reasons for these are due to financial reporting differences between Islamic and conventional banks, reporting differences between countries, differences between and Islamic and conventional bank's nature of doing business (contracts) etc. Keeping these issues in mind, we selected two measures of bank risk, accounting based Z-Score and the ratio of Non-Performing Loans to Assets.

3.3.1 Z-Score

It's a measure of bank's stability (solvency) and can be defined as

$$Z = (k + \mu)/\sigma$$

Where k is equity capital and reserves as percent of assets, μ is the net return as percent of assets, and σ is standard deviation of return on assets. Z-score has been widely used in banking research (Cihak & Hesse 2008; Maechler et al. 2005; Boyd & Runkle 1993 etc). It is inversely related to the probability of a bank's insolvency. A high Z-Score, therefore, implies less risk of insolvency, hence a more stable bank.

The question of finding comparability and reliability by applying Z-Score across Islamic and conventional banks has its answer given by Cihak & Hesse (2008). An important feature of the z-score is that, it is a fairly objective measure of soundness across different groups of financial institutions. It is an objective measure because it focuses on the risk of insolvency, i-e the risk that a bank (conventional or Islamic) runs out of capital and reserves or the value of its assets becomes lower than the value of debt.

Furthermore, Zaabi (2008) also used it and indicated that it is a beneficial diagnosis tool for possible causes standing behind the deterioration of financial performance. Taffler & Agarwal (2007) examined the failure prediction ability of Z score. The result of their research indicates that Z score has true ability of forecasting failure and more accurate framework than alternative simple approaches. Moreover, they concluded that it would be inappropriate to seek ways to apply initial model of Altman which is applicable for US market, for other markets without taking in consideration of market specificities.

A criticism on Z-Score in Islamic banks is that, a large portion of liabilities of Islamic banks comprises investment accounts (deposit accounts) that can be recognized as an equity investment. Investment accounts are offered in different forms, often linked to a pre-arranged period of maturity, which maybe from one month upwards, and the funds can be withdrawn by giving a one month advance notice (Cihak & Hesse 2008). The profits and returns are distributed between the bank and depositors, according to a pre-determined ratio e-g 80% to depositors and 20% to bank (Iqbal & Mirakhor 2007). Therefore, in terms of risk profile these investment accounts are similar to mutual funds (equity stake), while transferring all risks to its investors. So this way the book value of shareholder's equity is undervalued since investment accounts are placed under the liabilities section of an Islamic Bank's balance sheet. However, if we look at conventional banks, they can also transfer this risk by adjusting deposit and loan rates (floating rates schemes). In such case Cihak & Hesse (2008) argue that most of the investment accounts can be withdrawn in a relatively short period of time, as well as the fact that the return distribution between the bank and the depositors/investors is pre-determined, diminishes the factual differences in risk profiles associated with the investment accounts, compared with floating-rate deposits and other conventional funding used by commercial banks. So, while the differences between Islamic and conventional banks should be born in mind, capital and reserves are still a reasonable proxy variable to assess the "bottom line" default risk.

3.3.2 Non Performing Loans/Assets

A number of indicators are used as measures of asset quality and operational risk in banks. A clear signal of asset quality is the ratio of nonperforming loans to total assets. This ratio measures the percentage of loans a bank might have to write off as losses (Peria & Schmukler 2001). Specifically the overall quality of loan portfolio is judged by three measures; Provisions for Loan Losses, Net Charge Offs and Non Performing Loans (Berger & Davies 1998). NPL/assets have been widely used in banking research (Avery et al. 1988; Berger et al 2000; Birchler & Hancock 2004; Bliss & Flannery 2002, Covitz et al. 2004).

High amount of Non Performing Loans either indicate that the bank is in poor condition or there is a greater uncertainty about bank's future performance (Flannery & Sorescu 1996). On one hand, a surge in the ratio of nonperforming loans to assets has a negative impact on deposits, and banks with a larger share of nonperforming loans pay higher interest rates on the other (Peria & Schmukler 2001). Market can view a given ratio of non-performing loans/assets, more adversely at less capitalized institutions than for better capitalized institutions (Jagtiani et al. 2002).

3.4 Control Variables

A number of control variables, both at the bank and country level, are included for analysis. The choice of control variables is made on the basis of previous literature available. As mentioned earlier, we had no other choice than to base our study on the previous work of Cihak & Hesse (2008) due to fact that, very few amount of empirical comparative research done in this area. We have included bank size (assets), loan/assets (liquidity), cost/income (cost efficiency), and income diversity (diversification) as bank level control variables.

Controlling for bank size is important, and it has been used extensively in other studies on bank risk (Forssbaeck 2008b). Loan/assets is a measure of liquidity i-e higher the ratio, less liquid the bank is. This measure is also an important control variable and used previously (Cihak & Hesse 2008; Krishnan et al. 2006; Bliss and Flannery 2002; Peria & Schmukler 2001).Cost/Income is a measure of how much cost efficient a bank is by comparing total expenses to total income generated. The use of this measure is evident from Forssbaeck (2008a) and Cihak & Hesse (2008).

As mentioned earlier in sample selection, 35% of total observations are consolidated ones. So to control for the differences in the structure of bank's income, we include a measure of Income diversity that is motivated by Laeven & Levine (2005). This variable captures the degree to which banks diversify from traditional lending activities (those generating net interest income) to other activities (Cihak & Hesse 2008). For Islamic banks, the net interest income is generally defined as the sum of the positive and negative income flows associated with the PLS arrangements (International Monetary Fund 2004).

We included Country income level, GDP growth and Inflation as country level control variables. These are commonly used country level control variables on banking studies (Forssbaeck 2008b; Cihak & Hesse 2008)

To distinguish the impact of bank type on the Z-Score and NPL/Assets, we have included a dummy variable that takes the value of 1 if the bank in question is an Islamic bank, and 0 otherwise i.e., if it is a commercial bank (Cihak & Hesse 2008). If Islamic banks are relatively weaker than commercial banks, the dummy variable would have a negative and positive sign in the regression explaining Z-Score and NPL/Assets, respectively. A detailed description of each variable is provided in Appendix 3.

3.5 Regression Analysis

Regression analysis is a widely used statistical tool, to explore the effect of one variable upon another and draw empirical conclusions. Since our data is both cross-sectional (66 Banks) and time-series (2005-08) in nature, we have primarily used Panel data analysis, which is consistent with Cihak & Hesse (2008) and Forssbaeck (2008a&b).

Baltagi (2008) gives a number of advantages of using panel data analysis, such as its ability to the control for heterogeneity and to identify and measure effects that are undetectable in individual cross-sections or time-series analysis. Nevertheless panel regression also have shortcomings, one of them is short time series measurement listed by Baltagi (2008). Our sample consists of a maximum of 4 year (2005-08) panel observations, and for some banks (especially Islamic) there are only one or two yealy observations available, so this limitation would be cosiderable in this study. A counter argument to this is that panel data has many more degrees of freedom that provide the possibility to control for omitted variable bias and reduce problem of multi-collinearity, hence the accuracy of parameter estimates and prediction is improved (Chen et al 1999).

Our second objective was to see the comparative performance of Islamic and conventional banks in financial crisis proxy year (2008). One possible approach for this was to use yearly cross-sectional regression (OLS) and see if there were any significant differences in coefficent estimates in year 2008 from previous years. The problems with cross-sectional

approach is that this method does not take into account the time series variations and the results based upon pure cross section regression have little to say. Ordinary Least Squares (OLS) has also been criticized by Kao & Chiang (2000) that the OLS estimator has a non-negligible bias in finite samples.

Keeping these benefits, limitations and our objectives in mind, we have used Panel and Cross-section regressions to arrive at conclusions. Additionally we have used Panel regression with fixed period effects as a robustness check. We also took averaged data for four years and apply cross-sectional regression (OLS) to check for consistency.

3.5.1 Regression Model

The resultant regression is tested in statistical package EViews with following risk proxies (Z-Score, NPL/Assets) as dependent variable, with a vector of four bank level and three country level control variables included.

$$Y_{i,j,t} = \alpha + \beta1 (\text{Bank Level Control})_{i,j,t} + \beta2 (\text{Country Level Control})_{j,t} + \beta3 (\text{Islamic Dummy})_i + \varepsilon_{i,j,t}$$

Where $Y_{i,j,t}$ is the risk measure (Z-Score or NPL/Assets) for bank i, in country j, at time t.

$\beta1$ (Bank level control) is a vector of bank level control variables (assets, loan/assets, cost/income and income diversity). $\beta2$ (Country level control) is a vector of country level control variables (Country income level, GDP growth, Inflation). $\beta3$ (Islamic dummy) is included to differentiate between Islamic and Conventional Banks. It takes the value of 1 for Islamic and 0 for conventional banks. $\varepsilon_{i,j,t}$ is a residual.

4 Empirical Findings and Analysis

This chapter presents the results of the regression and an analysis of them. In order to facilitate the interpretation of empirical findings, a section on Descriptive Statistics and Correlation Matrix is presented before the regression results.

4.1 Descriptive Statistics

An initial look of the sample yields the following summary statistics.

Table 6
(Summary Statistics)

	Mean		Std. Deviation		Min		Max		Observations	
Measures	Isl.**	Con.***	Isl.**	Con.***	Isl.**	Con.***	Isl.**	Con.***	Isl.**	Con.***
Z-Score	95.97	35.32	231.76	38.83	0	-1.38	1697	197	92	153
Z-Score*	35.55	34.55	24.59	37.78	0	-1.38	87	197	82	152
NPL/Assets	0.019	0.032	0.014	0.052	.001	.001	.07	.253	63	136
Loan/Assets	0.43	0.55	0.21	0.13	.004	.03	.873	.861	90	152
Cost/Income	0.88	0.76	1.14	0.278	.238	.227	10.62	2.70	88	152
Cost/Income*	0.77	0.75	0.45	0.23	.238	.227	3	1.62	87	151
Income Diversity	0.73	0.5	0.47	0.28	0	.05	2	1.58	90	152
Assets (In USD Billion)	6.29	13.39	10.17	20.24	.017	44	.044	116	113	152

*Excluding Outliers   **Islamic Banks ***Conventional Banks

The basic sample analysis shows that Islamic and conventional banks on average are quite same in terms of their z-score (stability) when excluding for outliers. The table also reveals the importance of outlier treatment, because if outliers were not removed, our empirical results could have been otherwise (because there are some Islamic banks with extremely high z-score). A comparison of Islamic and conventional banks z-scores suggest that the difference is statistically insignificant both with Panel and Cross sectional regression. These results validate the findings of Choong and Liu (2006) who argue that, by practice

(operations) Islamic banks deviate from basic PLS[16] paradigm and are quite similar to conventional banks, at least in Malaysia. Furthermore the z-score demonstrate high variability in case of conventional banks (-1.38 to 197) than Islamic banks (0 to 87) leading to overall z-score volatility of conventional banks (38%) and Islamic banks (25%). This confirms the basic Islamic banking philosophy which forbids them to invest in highly speculative or leveraged businesses or transactions.

Islamic banks on average have lower NPL/Assets ratio (1.9%) as compared to conventional banks (3.2%) depicting better asset quality and operational effectiveness of Islamic banks. The comparison of Islamic and conventional bank mean NPL/assets ratio, through Panel and Cross sectional regression, suggests the same that Islamic banks are operationally stronger than conventional banks (negative sign of Islamic dummy beta coefficient) , though the results are rather weak. Again NPL/Assets ratio has more variability in case of conventional banks (.001 to .253) than Islamic banks (.001 to .07), hence is more volatile in case of conventional banks (5.2%) than Islamic banks (1.4%) confirming the less risk profiles of Islamic banks. These low NPL/Assets ratios of Islamic banks can also be due to their more diversified investments.

As to control variables, Islamic banks have lower Loan/Assets ratio (43%) than conventional banks (55%), exhibiting the better liquidity situation of Islamic banks. The difference is significant at 5% in Panel and average Cross sectional regression explaining NPL/Assets but is insignificant for the regression explaining Z-score. These results are contradictory with the findings of Cihak & Hesse (2008), who found the Loan/Assets ratios of Islamic and conventional banks to be quite same. The possible reason for that maybe the divergence of Islamic banks from traditional lending (PLS) activities towards more diversified Investment Banking, Asset Management business in recent years. The volatility of Loan/Assets ratio is more in Islamic banks (21%) than conventional banks (13%) indicating high variability across Islamic banks.

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[16] Profit and Loss Sharing Arrangements

Islamic banks on average have higher Cost/Income ratio (88%) than conventional banks (76%), illustrating the less cost efficiency of Islamic banks, which is in line with Cihak & Hesse (2008) and Moktar et al. (2006). Moktar et al. (2006) found that Islamic banks are less cost efficient than conventional ones in Malaysia. They also found that this gap is decreasing over time. Cihak and Hesse (2008) found the same patterns on a cross country scale. This difference in Cost/Income ratios is significant at 5% for the panel regression explaining Z-Score and at 1 % for the estimation explaining NPL/Assets ratio. The variability and consequently volatility of Cost/Income ratio is more in Islamic banks (45%) than conventional ones (23%), one possible reason for this can be the age (experience) factor for Islamic, banks which are quite new in their existence and having cost cutting issues.

As far as Income diversity is concerned, Islamic banks are more diversified (73%) than conventional banks (50%) i-e they are more involved in non-lending activities. It's also evident from the low value of Islamic banks Loan/Assets ratio. This finding is contradictory with the previous findings of Cihak & Hesse (2008) who found that Islamic banks are alike to conventional banks when it comes to non-lending business (diversification). This difference is significant for the regression explaining NPL/Assets but not for Z-Score. Further the variability and volatility of Income diversity is more in case of Islamic banks (47%) than conventional banks (28%) depicting more fluctuations in sources of income streams Islamic banks have.

Finally the conventional banks in our sample, on average are twice as big as Islamic banks are. This finding is contradictory with the previous finding of Cihak and Hesse (2008). There can be two possible reasons for that: firstly it can be due to the sample size which is smaller than Cihak & Hesse (2008) and secondly Islamic banks are quite new (less accumulated earnings) while most of the conventional banks are matured ones.

4.2 Correlation Matrix

A correlation matrix is obtained to control for multi-collinearity. This matrix is prepared for the data (2005-08). Yearly correlations matrices are presented in Appendix 4.

Table 7
(Correlation Matrix)

	Z-SCORE	NPL/ASSETS	LOAN/ ASSETS	INCOME DIVERSITY	GDP GROWTH	CPI	COST/INCO ME	ASSETS	COUNTRY INCOME LEVEL
Z-SCORE	1								
NPL/ASSETS	-0.18	1							
LOAN/ASSETS	-0.00	0.08	1						
INCOME DIVERSITY	-0.05	-0.25	-0.39	1					
GDP GROWTH	0.07	-0.04	-0.13	0.21	1				
CPI	-0.20	0.20	0.20	-0.12	0.35	1			
COST/INCOME	-0.14	0.51	-0.01	-0.50	-0.21	0.16	1		
ASSETS	0.02	-0.23	0.21	0.05	-0.30	-0.17	-0.07	1	
COUNTRY INCOME LEVEL	0.02	-0.23	0.01	0.45	0.54	0.07	-0.40	0.16	1

As can be seen from the table, there is no severe multi-collinearity problem among the measures, except between country income level and GDP Growth (.54). It's expected since high GDP growth rate results in high Per capita income provided that the population increase is not with the same percentage. Also it's consistent with previous research (Forssbaeck 2008b) to include these two variables together.

4.3 Regression Results and Discussion

In this part we present regression results and their analysis, after running different specifications. Table 8 shows the panel regressions (with and without period fixed specifications). Tables 9 & 10, present the cross sectional (year wise) and averaged data regression for Z-Score and NPL/Assets respectively.

All panel regressions have significant F-statistic suggesting that at least one of the beta coefficients in each model is significant. However the R-squared indicates that there is only a small portion of variance in the Z-score (9.2% to 11.4%) and NPL/Assets (28% to 29%) that is explained by the models. The models in Cihak & Hesse (2008) had also a rather low R-

squared ranging from 15% to 22% with different specifications. As compared to Cihak & Hesse (2008), who found majority of bank level control variables significant at 1% and 5% explaining Z-score, our results show only one bank level control variable significant at 5%. A possible reason for that is maybe the sample size: Cihak & Hesse (2008) had up to 520 observations for Islamic banks and 3248 for conventional banks, while our sample has up to 104 observations for Islamic and 160 for conventional banks. Table 8, 9, and 10 also demonstrate that explanatory variables are fairly stable in terms of their sign over the period 2005-08, implying that the relationship holds even if not significant.

The regression confirms the results from the simple comparison of Z-Score across Islamic and conventional banks. We have not been able to find statistically significant differences between Islamic and conventional bank risk proxies (Z-Score and NPL/assets). Though in Panel regression, the Islamic dummy coefficient explaining NPL/Assets is predominantly negative (negative implies Islamic Banks are less risky and consequently more stable since higher the NPL/Assets ratio, more risky a bank is). Islamic Dummy coefficient explaining Z-Score is positive (positive implies that Islamic Banks are less risky since higher the Z-Score, less risky the bank is) when we set the Panel estimation without period fixed effects and was negative with period fixed effects. Since in both cases (Z-Score, NPL/Assets), and with different specifications, the t-statistics are not statistically significant, the comparison of Islamic and conventional banks' stability (riskiness) becomes less clear-cut. Our findings are in line with the findings of Cihak & Hesse (2008). When they compared Islamic Banks with conventional ones irrespective of their size, their Islamic dummy coefficient was insignificant most of the times.

The cross-sectional regression also gives statistically insignificant results for Islamic dummy variable explaining both risk proxies. The Islamic dummy variable explaining NPL/Assets was predominantly negative (implying Islamic banks are operationally less risky and more stable) for all years and averaged data. This similarity of Islamic dummy variable sign in both Panel and Cross sectional regression confirms that Islamic banks are somewhat more operationally stable (having lower NPL/Assets ratios) than conventional banks, although this argument is not statistically strong. Islamic dummy explaining Z-Score was negative for

2005 and 2006 (implying Islamic banks are more risky) but was positive for 2007, 2008 and averaged data (implying Islamic banks are less risky). This implies that Islamic banks in our sample are becoming somewhat more stable (less risky) by gaining experience with the passage of time.

The control variables have generally the expected relationships. Theoretically banks with higher Loan/assets ratio (less liquid) tend to have less Z-Score (Cihak & Hesse). It implies that banks' stability tend to decrease as its liquidity decrease. Though a weak relationship, but it's evident (negative sign) from the panel, average and from two of four cross sectional regressions. Panel estimation results show that an increase in the Loan/Assets ratio by one unit would decrease banks' stability by a factor of 11.2 and 5.52 through normal and period fixed effects respectively. The averaged data OLS regression also confirms this inverse relationship i-e a one unit increase in the Loan/Assets ratio would decrease banks' stability by a factor of 56.73. Loan/Assets showed a strong positive relationship with NPL/assets. It should be positively related since banks' more investment in loans would eventually result in more Non Performing Loans and it stresses the need for sound operational controls and risk management frameworks for banks extending credits. This relationship is evident at 5% confidence level in Panel estimation (with and without period fixed effects), averaged cross sectional estimation and also at 10% significance in 2005. The panel and averaged data OLS estimations show that an increase in the Loans/Assets ratio by one unit would increase the NPL/Assets ratio by a factor of .034 and .06 respectively.

Cost/Income ratio demonstrated a strong negative relationship with Z-Score, implying that banks' stability tends to decrease as they become less cost efficient. It's consistent with Cihak & Hesse (2008) and Forssbaeck (2008a) and significant at 5% in the panel and OLS (year 2005) estimation. The relationship has a negative sign throughout the yearly cross sectional regression implying a stable relationship even if not significant in yearly regressions. The panel estimation shows that an increase in the Cost/Income ratio by one unit would decrease the stability by 24.94 and 27.11 units with the normal and period fixed specifications respectively. The regressions depict a strong positive relationship between Cost/Income and NPL/Assets. This positive relationship of Cost/Income with NPL/assets

stems from the fact that higher the cost/income ratio, the less the income reported in the income statement and the more problems the bank's collection department having in collecting its interest or principal payments, eventually leading to higher Non performing loans. The panel estimation shows that an increase in the Cost/Income ratio of one unit leads to an increase in the NPL/Assets ratio by a factor of .05 (evident at 1% confidence level). The yearly cross sectional regressions also show that an increase in the Cost/Income ratio by one unit leads to an increase in the NPL/Assets by a factor of .052 (sig. at 1%), .039 (sig. at 1%), .048 (sig. at 10%), .087 (sig. at 5%), .037 (sig. at 5%) in the years 2005, 06, 07, 08 and averaged data respectively.

Income diversity has a negative relationship with Z-Score which is consistent with Cihak & Hesse (2008). It implies here that greater diversification (moving away from traditional lending activities) reduces stability. A statistically weak position though but panel regression shows that an increase in Income diversity measure of one unit leads to decrease in overall stability of the bank by a factor of 14. The yearly OLS regressions also have the same sign except year 2007, with minor differences in size. Income diversity shows a positive relationship with NPL/Assets ratio and is significant at 10 % in panel regressions, also at 10% in cross sectional regression for year 2008. It's not significant for all yearly OLS regressions but has the same positive sign which shows that the relationship holds. This relationship is quite interesting since it depicts that moving away from traditional lending activities does not guarantee operational effectiveness or internal controls. The panel estimation shows that increase in the Income diversity measure of one unit increases NPL/Assets by a factor of .012. So this urges the banks for more effective operational risk management strategies, in part with diversifying their investment portfolios.

Our results show that a weak relationship between bank size and Z-score exits and as banks become bigger (assets size) their overall stability tends to decline. These results diverge from the previous findings of Cihak & Hesse (2008) and Forssbaeck (2008b), a possible reason for that can be the smaller sample size. The panel regression shows that an increase in the assets size by one unit leads to a decline in overall stability by a factor of nearly 1 i-e bank stability decreases with the same magnitude as bank become bigger. The yearly OLS regression

shows the same negative sign with slightly different magnitude. This indicates the risk management challenges banks have to face as they become bigger. Bank size has a negative relationship with NPL/Assets implying that as banks become bigger, they have less NPL/assets i-e more operational effectiveness. This finding is consistent with Forssbaeck (2008b). The panel estimation depicts that an increase in the asset size by one unit decreases NPL/Assets by a factor of .0006. Yearly OLS regression show the same negative sign and significant at 5% in year 2008. This poses concerns for smaller banks regarding their operational risk management strategies.

As far country level control variables are concerned, GDP growth has a positive relationship with Z-Score explaining that bank stability increases as economic activity increases within a country. It's significant at 1 % and 5% in the panel regression with normal and period fixed effects respectively and at 1% cross sectional regression (2006-7). Though a weak relationship, it's also positive with the NPL/Assets ratio implying the fact that bank's operational risk increases with the general demand for money. A probable reason for that might be that banks move from low risk towards high risk profiles in good times.

The results show that Inflation tends to decrease Z-score (stability). It has a strong position and significant at 1% in panel regressions, at 5 %, 1% in cross section regression for year 2006 and 07 respectively. It shows that the banks' overall stability decreases when interest rates in the economy increase. It has a positive relationship with NPL/Assets implying that whenever interest rate rise banks' face problems in collecting interest and principal payments. Although weak but the stability in negative sign in all regression confirm the relationship. Country income level is negatively related with NPL/Assets, implying that banks collect their interest and principal more when per capita income increases. It's again a weak position but the negative sign confirms the stability in relationship.

Our second objective was to see the stability of Islamic and conventional banks in financial crisis proxy year 2008. Overall, the descriptive statistics, panel regressions and averaged OLS regression depict that Islamic banks are slightly (though weak position) more stable than conventional banks. The Islamic dummy coefficient explaining Z-score is negative

(implying Islamic banks are less stable) in years 2005-06 and positive (implying Islamic banks are more stable) in years 2007 and 2008. It somehow tells us that with the passage of time Islamic banks are becoming more stable and it is evident in financial crisis proxy year 2008. But since the results are not statically significant even at 10 % confidence level, it becomes difficult for us to provide a clear cut answer that actually Islamic banks are materially more or less stable in year 2008. The same is the case with Islamic dummy coefficient explaining NPL/Asset which is negative in all regressions implying Islamic banks are operationally less risky or more stable. Again it does not depict a strong position (significance) and we cannot give a definitive judgment. The other control variables have generally the same relationships (sign) in the regressions explaining Z-score and NPL/Assets depicting that the model holds in year 2008.

4.4 Summary Analysis

We have primarily used regression for our empirical analysis by taking Z-Score and NPL/Assets as a measure of overall and operational stability (risk) respectively. These are one of the widely used risk measures on banking research. Theoretically there is no clear cut judgment that says Islamic banks are operationally and overall more or less stable (risky) than conventional banks and the theoretical comparisons in previous papers represent mixed results. We have examined the operational and overall stability (riskiness) by using Islamic Dummy Variable in regression model to distinguish between Islamic and Conventional banks. Based upon the results of our Islamic dummy coefficient explaining both risk proxies, operationally and overall Islamic and conventional banks do not show any significant stability (riskiness) differences. This has also been evident from mean Z-Score comparison of Islamic and Conventional banks in descriptive statistics (Table 6). Therefore the empirical results support the mixed theoretical foundations. Moreover, our empirical results by employing data from 8 banking systems with a strong presence of Islamic banks confirm the recommendations of Choong and Liu (2006) that Islamic banking as practiced in Malaysia, deviates from the basic Islamic PLS paradigm, and should not be considered different from Conventional banking for empirical analysis.

Table 8
(Regression Results: Panel Ordinary Least Squares 2005-08)

	Normal	**Period Fixed**	**Normal**	**Period Fixed**
Dep. Variable	**Z-Score**	**Z-Score**	**NPL/Assets**	**NPL/Assets**
Islamic Dummy	.541 (.091)	-.55(-.105)	-.004(-1.18)	-.003(-1.01)
Assets [a]	-.978(-.638)	-1.34(-.876)	-.0006(-.532)	-.0006(-.481)
Loan/Assets	-11.2(-.613)	-5.52(-.301)	.034(2.51)**	.032(2.33)**
Cost/Income	-24.94(-2.14)**	-27.11(-2.32)**	.050(6.42)***	.051(6.47)***
Income Diversity	-14.44(-1.50)	-13.42(-1.39)	.012(1.87)*	.012(1.71)*
Country Income Level [a]	.745(.275)	-1.30(-.461)	-.002(-1.32)	-.002(-1.01)
GDP Growth	277.7(2.08)**	449.8(2.96)***	.106(1.06)	.079(.689)
Inflation	-153.23(-2.72)***	-248.4(-3.58)***	.003(.107)	.013(.293)
Constant	74.11(2.51)**	79.36(2.69)***	-.026(-1.11)	-.026(-1.12)
R^2	.092	.114	.284	.292
Adjusted R^2	.059	.069	.253	.249
F (P Value)	2.77(.006)	2.54(.004)	9.23(.000)	6.87(000)
Observations	228	228	195	195

The Table Reports coefficient estimates from Panel OLS estimation with and without period
Fixed effects. T-Statistics are in Parenthesis. */**/*** denotes significance at 10/5/1
percent confidence level. [a] Natural Logarithm is taken for values in USD 000.

Table 9
(Regression Results: Ordinary Least Squares (Z-Score))

Year	2005	2006	2007	2008	Average
Dependent Var.	**Z Score**	**Z Score**	**Z Score**	**Z Score**	**Z Score**
Islamic Dummy	-14.92(-1.03)	-.810(-.072)	6.56(.647)	.485(.047)	**14.85(1.01)**
Assets [a]	-2.51(-.352)	-.71(-.222)	-.408(-1.22)	-2(-.705)	**-4.30(-.94)**
Loan/Assets	14.27(.358)	-16.17(-.486)	39.63(1.32)	-18.41(-.534)	**-56.73(-.49)**
Cost/Income	-31.83(-1.01)	19.19(-1.18)	-4.53(-.172)	-27.7(-2.55)**	**-53.41(-.983)**
Income Diversity	-17.60(-1.03)	-17.83(-1.01)	.639(.039)	-6.81(-.507)	**-38.13(-.769)**
Country Income Level [a]	6.90(1.15)	-4.06(-.856)	-4.39(-1.23)	-4.84(-.486)	**3.17(.246)**
GDP Growth	278.9(.579)	937.3(3.08)***	986.65(4.13)***	227.92(.434)	**-22.17(-.02)**
Inflation	-252.2(-1.05)	-547.4(-2.58)**	-387.63(-3.18)***	-196.4(-1.05)	**-200.4(-.52)**
Constant	81.17(.809)	62.08(.96)	-17.43(-.22)	122 (2.31)**	**200(1.18)**
R^2	.12	.187	.243	.143	.130
Adjusted R^2	-.06	.06	.131	.006	-.003
F (P Value)	.66(.72)	1.47(.19)	2.17(.044)	1.04(.413)	.97(.46)
Observations	48	60	63	59	61

The table reports coefficient estimates from OLS estimation with white heteroskedasticy consistent standard errors. T-Statistics are in Parenthesis.*/**/*** denotes significance at 10/5/1 percent confidence level .[a] Natural Logarithm is taken for values in USD 000.

Table 10
(Regression Results: Ordinary Least Squares (NPL/Assets))

Year	2005	2006	2007	2008	Average
Dependent Var.	NPL/Assets	NPL/Assets	NPL/Assets	NPL/Assets	NPL/Assets
Islamic Dummy	-.003(-.432)	-.003(-.894)	-.001(-.331)	-.028(-1.57)	**-.006(-1.42)**
Assets [a]	-.002(-.67)	-.0005(-.426)	.001(-.507)	-.006(-1.28)**	**-.002(-1.60)**
Loan/Assets	.056(1.74)*	.028(1.84)	.03(1.03)	.05(.853)	**.06(2.34)****
Cost/Income	.052(3.82)***	.039(3.74)***	.048(1.67)*	.087(2.30)**	**.037(2.13)****
Income Diversity	.005(.49)	.006(.995)	.014(.99)	.055(1.73)*	**.011(.73)**
Country Income Level [a]	.002(.660)	-.003(-.909)	-.005(-1.86)	-.015(-1.38)	**-.003(-.98)**
GDP Growth	-.151(-.757)	.200(1.17)	.282(1.91)*	.789(1.76)*	**.381(1.66)**
Inflation	-.030(-.288)	-.108(-1.27)	-.057(.795)	-.223(-1.03)	**-.141(-1.40)**
Constant	.002(.045)	-.011(-.55)	-.005(-1.04)	.032(.338)	**-.006(-1.66)**
R^2	.350	.383	.32	.324	**.303**
Adjusted R^2	.183	.266	.20	.201	**.177**
F (P Value)	2.09(.067)	3.26(.005)	2.68(.016)	2.64(.018)	**2.40(.03)**
Observations	40	51	54	53	**53**

The table reports coefficient estimates from OLS estimation with white heteroskedasticy consistent standard errors. T-Statistics are in Parenthesis.*/**/*** denotes significance at 10/5/1 percent confidence level .[a] Natural Logarithm is taken for values in USD 000.

5 Conclusion and Proposals for Further Research

We present our conclusions for the conducted study in this final chapter. Finally some ideas about further research are presented.

The purpose and motivation of the study was to investigate empirically, the comparative stability of Islamic and conventional banks during years 2005-08. Additionally we wanted to examine the stability of Islamic and conventional banks in financial crisis proxy year 2008. We have analyzed both banking systems on a cross country scale, by taking data for four years (2005-08) from 8 banking systems where Islamic banking has a non-negligible presence and finally ending up with 26 Islamic and 40 conventional banks. Using NPL/Assets and Z-score as risk proxies, we found that there are no statistically significant risk (stability) differences between Islamic and conventional banks during years 2005-08. Moreover the risk (stability) difference between Islamic and conventional banks is not evident in financial crisis proxy year 2008 implying that Islamic banks are not less risky in current financial crisis. We found that bank level control variables (bank size, loan/assets, cost/income, and income diversity) and country level control variables (country income level, GDP growth and inflation) are to various extents, determinants of bank's stability.

Our findings are part of the groundwork in the field of empirical research on Islamic finance. Islamic Finance is a vast and fascinating field covering from simple business transactions to more complex securitization contracts. It's in growth stage while facing prudential, competitive and Islamic law compliance challenges. A possible reason for the underperformance of Islamic banks is their business life cycle. Conventional banking, on the other hand, is quite matured, while having established accounting and legal standards. At present many conventional banks from nearly all over the world are taking interest in Islamic banking as a new market niche and opening their dedicated Islamic banking branches.

There are still considerations regarding this type of comparative cross country study, including sample coverage, usage of consolidated and unconsolidated data, market data unavailability problems in Islamic banks, comparability issues across Islamic and conventional banks, contract differences etc. There are other factors like governance

indicators (political stability, regulatory quality, and government effectiveness), ownership structure, industry structure and deposit insurance etc. which can affect a bank performance and hence should be taken into account.

There is a wide scope for improvement and further research in the area of comparative banking and finance. Instead of emphasizing on contract differences and nature of doing business, the facets of Islamic finance should be more empirically compared with conventional one, since Islamic finance is spreading rapidly around the globe and more research is required in this field to find out whether it's really a more stable financing solution.

The coverage of our sample can be extended to include more cross sections (more banks, especially Islamic) and time series (years). We have only taken fully fledged Islamic Banks to compare with conventional banks for our analysis. As mentioned earlier some conventional banks have dedicated Islamic banking business. An idea would be to compare performance and stability of fully fledged conventional banks with conventional banks having dedicated Islamic banking business. Another idea would be to compare Islamic Investment Banking, Asset Management business with conventional ones. Moreover, as more reliable data on current financial crisis becomes available, an approach would be to take it into account while comparing Islamic and conventional banks. This will give a better picture of the sensitivity (exposure) of Islamic and conventional banks to macroeconomic fluctuations to find out which one of them is more resilient and better.

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APPENDICES
Appendix 1
(The Basic Islamic Banking Terminology)

Term	Explanation
Amana (Demand deposits)	Deposits held at the bank for safekeeping purpose. They are guaranteed in capital value, and earn no return.
Bay mu'ajal (Pre-delivery, deferred payment)	The seller can sell a product on the basis of a deferred payment, in installments or in a lump sum. The price of the product is agreed upon between the buyer and the seller at the time of the sale, and cannot include any charges for deferring payment.
Bay salam (Pre-payment, deferred delivery)	The buyer pays the seller the full negotiated price of a product that the seller promises to deliver at a future date.
Ijara (Lease, lease purchase)	A party leases a particular product for a specific sum and a specific time period. 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.
Istisna Deferred payment, deferred delivery)	A manufacturer (contractor) agrees to produce (build) and to deliver a certain good (or premise) at a given price on a given date in the future. The price does not have to be paid in advance (in contrast to *bay salam*). It may be paid in installments or part may be paid in advance with the balance to be paid later on, based on the preferences of the parties.
Ju'ala (Service charge)	A party pays another a specified amount of money as a fee for rendering a specific service in accordance with the terms of the contract stipulated between the two parties. This mode usually applies to transactions such as consultations & professional services, fund placements and trust services.
Kifala	It is a pledge given to a creditor that the debtor will pay the debt, fine or liability. A third party becomes surety for the payment of the debt if unpaid by the person originally liable.
Mudaraba (Trustee finance contract)	*Rabb -ul- mal* (capital's owner) provides the entire capital needed to finance a project while the entrepreneur offers his labor and expertise. Profits are shared between them at a certain fixed ratio, whereas financial losses are exclusively borne by *rabb -ul- mal*. The liability of the entrepreneur is limited only to his time and effort.
Murabaha (Mark–up financing)	The seller informs the buyer of his cost of acquiring or producing a specified product. The profit margin is then negotiated between them. The total cost is usually paid in installments.
Musharaka (Equity participation)	The bank enters into an equity partnership agreement with one or more partners to jointly finance an investment project. Profits (and losses) are shared strictly in relation to the respective capital contributions.
Qard Hassana (Beneficence loans)	These are zero-return loans that the *Qur'an* encourages Muslims to make to the needy. Banks are allowed to charge borrowers a service fee to cover the administrative expenses of handling the loan. The fee should not be related to the loan amount or maturity.

Sources: Errico and Farrahbaksh (1998) and El-Hawary, Grais, and Iqbal (2004)

Appendix 2A
(Distribution of Banks by Country)

Country	Number of Islamic Banks	Average Asset Size During the Period 2005-08 ($ M)	Number of Conventional Banks	Average Asset Size During the Period 2005-08 ($ M)	Total Banks
Pakistan	5	248,45	12	1528,21	17
Malaysia	6	2029,39	9	20150,7	15
Bahrain	5	2152,4	5	6328,6	10
Kuwait	1	25966,7	2	12688,5	3
Qatar	2	4156,1	1	26678,8	3
Saudi Arabia	3	29068,7	2	43308,6	5
UAE	2	11405	5	10846,8	7
UK	2	529	4	32277,4	6
Grand Total	**26**	**75555,7**	**40**	**153807,6**	**66**

Appendix 2B
(Distribution of Observations on Variables)

	Dependent		Bank Level Control			
Year	Z-Score	NPL/Assets	Assets	Loan/Assets	Cost/Income	Income Diversity
2005	52	41	53	51	50	51
2006	63	52	65	64	64	64
2007	66	55	66	66	66	66
2008	62	53	61	61	61	61
Total	**243**	**201**	**245**	**242**	**241**	**242**

Appendix 2C
(Overview of Input Data)

	Islamic (26)			Conventional (40)		
	Unconsolidated	Consolidated	Total	Unconsolidated	Consolidated	Total
Number of Banks	16	10	**26**	27	13	**40**
Number of Observations Max.	64	40	**104**	108	52	**160**

Appendix 3
(Variable Description)

Variable	Description	Source
Z-Score	Defined as $z=(k+u)/\sigma$, where **k** is yearly equity capital as a percent of assets , **u** is the yearly net return on assets and **σ is** standard deviation of return on assets as a proxy for return volatility. Measures the number of standard deviations a return realization has to fall in order to deplete equity. It is negatively related to the probability of default.	Calculations based upon published Annual Reports Available on respective websites
Non Performing Loans/Assets	Non Performing Loans divided by total assets.	As above
Assets (Size)	The natural logarithm of total assets in USD 000. It's basically controlling for bank size which effects performance indicators	As Above
Loan/Assets	Total Loans divided by total assets. It a measure of liquidity i-e the more loans a bank has given, the less liquid it is.	As Above
Cost/Income	Total Expenses divided by total income. It's a measure showing how much cost effective a bank is.	As above
Income Diversity	$$1 - \left[\frac{Gross\ Interest\ Income - Other\ Operating\ Income}{Total\ Income} \right]$$ It compares a bank's income from non-core business activities with core business interest income. Higher value means a more diversified bank.	As Above. Calculations inspired by a pattern followed by Laeven & Levine (2005)
GDP Growth	Real GDP growth rate	CIA World Fact Book, World Development Indicators, EIU Views Wire
Inflation	Inflation Rate	As above
Country Income Level	The natural logarithm of GDP Per Capita (PPP Method) in USD 000.	As above
Islamic Bank Dummy	Equals 1 for Islamic Banks, 0 otherwise	Cihak & Hesse (2008)

Appendix 4
(**Yearly Correlation Matrices**)

2005	Z Score	NPL/Assets	Assets in USD 000	Loan/Assets	Cost/Income	Income Diversity	Income Level	GDP Growth	CPI	Islamic Dummy
Z Score	1									
NPL/Assets	-0.096	1								
Assets in	0.078	-0.164	1							
Loan/Assets	0.040	0.277	0.351	1						
Cost/Income	-0.147	0.479	-0.267	0.0295	1					
Income Diversity	0.006	-0.322	0.149	-0.283	-0.426	1				
Income Level	0.072	-0.135	0.0519	0.002	-0.397	0.314	1			
GDP Growth	0.007	-0.193	-0.212	-0.080	-0.118	0.180	0.051	1		
CPI	-0.155	0.012	-0.334	0.132	0.057	-0.094	-0.047	0.468	1	
Islamic Dummy	-0.161	-0.053	-0.136	-0.287	-0.080	0.305	0.110	-0.030	-0.141	1

2006	Z Score	NPL/Assets	Assets in USD 000	Loan/Assets	Cost/Income	Income Diversity	Income Level	GDP Growth	CPI	Islamic Dummy
Z Score	1									
NPL/Assets	-0.122	1								
Assets	-0.078	-0.234	1							
Loan/Assets	-0.143	0.143	0.310	1						
Cost/Income	-0.174	0.575	-0.129	-0.237	1					
Income Diversity	0.280	-0.361	-0.011	-0.256	-0.451	1				
Income Level	-0.074	-0.346	0.138	0.063	-0.203	0.351	1			
GDP Growth	0.082	-0.103	-0.264	-0.008	-0.248	0.134	0.485	1		
CPI	-0.126	-0.007	-0.227	0.136	-0.079	-0.107	0.119	0.758	1	
Islamic Dummy	0.103	-0.152	-0.212	-0.370	0.099	0.392	0.115	0.024	-0.092	1

2007	Z Score	NPL/Assets	Assets in USD 000	Loan/Asses	Cost/Income	Income Diversity	Income Level	GDP Growth	CPI	Islamic Dummy
Z Score	1									
NPL/Assets	-0.283	1								
Assets	-0.044	-0.292	1							
Loan/Assets	-0.018	-0.034	0.251	1						
Cost/Income	-0.166	0.518	-0.136	-0.232	1					
Income Diversity	0.053	-0.214	-0.024	-0.325	-0.497	1				
Income Level	0.021	-0.301	0.158	0.043	-0.403	0.428	1			
GDP Growth	0.298	0.008	-0.270	-0.136	-0.305	0.365	0.399	1		
CPI	-0.151	0.039	-0.142	0.168	-0.071	0.126	0.271	0.480	1	
Islamic Dummy	0.098	-0.168	-0.213	-0.359	-0.076	0.312	0.116	0.080	-0.05	1

2008	Z Score	NPL/Assets	Assets in USD 000	Loan/Assets	Cost/Income	Income Diversity	Income Level	GDP Growth	CPI	Islamic Dummy
Z Score	1									
NPL/Assets	0.132	1								
Assets	-0.060	-0.165	1							
Loan/Assets	-0.072	-0.028	0.120	1						
Cost/Income	-0.260	0.408	-0.077	-0.349	1					
Income Diversity	0.092	-0.093	0.087	-0.353	-0.182	1				
Income Level	0.064	-0.147	0.027	0.052	-0.257	0.498	1			
GDP Growth	0.001	0.025	-0.119	0.072	-0.224	0.190	0.417	1		
CPI	-0.178	0.205	-0.062	0.251	0.122	-0.392	-0.356	0.424	1	
Islamic Dummy	0.127	-0.242	0.082	-0.414	-0.132	0.344	0.118	0.044	-0.114	1

Appendix 5

(Development and Present Situation of Islamic Banking)

The modern Islamic banking industry is four decades old and is mainly clustered in the Middle East and Southeast Asia that are densely populated with Muslims. The governmental support and funds from wealthy individuals helped creating hub of Islamic banking in the Middle East. The GCC[17] members have decided to merge their domestic monetary and central banking systems by 2010, for creating a system like European Union (Khan & Bhatti 2008).

The governmental recommendations like having Islamic windows push conventional banks of Pakistan to think about ways of attracting savings of its population, which is the second largest densely populated Muslim country. However, hybrid markets of India are still on the way to adopt Islamic banking rules while in Bangladesh touchstones of Islamic banking have already settled. The South-East Asian region including Indonesia, Malaysia and Singapore which has a developed banking system, is also striving to attract investments from the Middle East and the Europe for their Islamic banking system.

2.2.1 Islamic banking in the Middle East

Notable growth in country income level and retail banking are making it as an attractive region for foreign banks. Islamic financial institutions are offering competitive customer-oriented products on the competition with the conventional financial institutions.

Bahrain

A leader in Islamic banking, Bahrain already has gone far away from other GCC countries in several areas of banking. It has strong regulatory history and hosts key Islamic financial organizations, such as AAOIFI[18] and IIRA[19]. Also, Bahrain is actively contributing a pool of Islamic banking research and training conferences.

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[17]Gulf Corporation Council, comprised of 6 countries including Bahrain, Oman, Kuwait, Qatar, Saudi Arabia and United Arab Emirates

[18] Accounting and Auditing Organization for Islamic Financial Institutions

[19] Islamic International Rating Agency

Since the establishment of the first Islamic bank (Bahrain Islamic Bank) in 1978, today there are more than 351 financial institutions in Bahrain, out of which 33 are Islamic (Arab News, 2006, P7). Majority of Bahraini Islamic banks are operating in international arenas, especially Islamic investment banks. For instance, couple of acquisitions done by Unicorn Investments Bank in 2008, were major equity stakes in two electronics and microchip manufacturers in California, as well as the creation of a $350m strategic acquisition fund (Khan & Bhatti 2008).

The Central Bank of Bahrain is playing a key role on development of Islamic financing and credit, collective investment schemes, Mutual Funds, Sukuk[20], Takaful[21] etc. The results of these efforts can be seen on investments bank's rating by The Banker magazine for 2008 that 12 out of 25 top Islamic banks were from Bahrain. At the beginning of this year (2009) Central Bank of Bahrain licensed another new Islamic investment bank which is named Capinnova Investment Bank (Emirates Business 24/7, 2009). Capinnova Investment Bank incorporated with an authorized capital of USD 500 million and paid-up capital of USD 125 million is going to make its core business private equity, asset management and corporate finance.

Moreover, the Islamic mortgage industry is rapidly growing in Bahrain due to prolonged boom in its real estate sector. Business firms and individual investors in Bahrain are increasing their reliance on Mutual Funds. Islamic financial institutions have secured unprecedented growth in Bahrain in terms of income, assets and deposits over the years. They are expected to experience further growth down the track (Khan & Bhatti 2008).

Kuwait

There are number of Islamic financial institutions besides it's a small country. It is estimated that Islamic financial institutions in Kuwait will manage funds of about US$56 billion by 2010 (Khoja 2006). "Kuwait Finance House (KFH)", the touchstone of Islamic banking in

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[20] Islamic equivalent of Bond
[21] Islamic equivalent of Insurance

Kuwait, was formed in 1977. It's the largest bank of country and second largest Islamic bank of the world. It received a lot of support from government when it was established and given a lot of freedom from regulations in order to run its business effectively.

However, in recent years the competition for KFH is increased, both domestically and internationally, but now well-established business and huge amount of retained capital over the years, is helping KFH to keep its position. Except financial hegemony of KFH, there are five Takaful and one re-Takaful companies, operating in Kuwait insurance market. In Kuwait, Islamic banks are mainly controlled by Ministry of Finance rather than Central Bank; nevertheless, they work under the regulations set by Central Bank.

Qatar

Qatar is also another example of growing Islamic banking industry of Middle East, despite its small geographical territory and population. The first Islamic bank was "Qatar Islamic Bank", formed in 1983. There are four national Islamic banks operating in Qatar, and various kind of financial service are being offered by other international financial institutions like Al-Jazeera from Saudi Arabia. Government of Qatar is promoting Islamic banking practices by Qatar Financial Center[22] which also tries to create equal opportunities for conventional banks in domestic and international level. Share of Islamic banking in Qatar's financial industry is approximately 30 percent but expected to reach 50 percent in coming two-three years (Khan & Bhatti 2008).

Saudi Arabia

The real modern establishment and development of Islamic banking goes around the mid of 1970's. Some big banks which are owned by Saudi Royal family, began their operations, outside of country, due to the fact that they had not received license to operate in Saudi Arabia till 2004 (Henry et al, 2004).

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[22] Qatar Financial Center is a business and finance center which provides legal and business Infrastructure for financial services

There are two regulatory organizations for the financial industry in Saudi Arabia. One is Saudi Arabian Monetary Agency which was instituted in 1952 performs the role of Central bank. Another one is Capital Markets Authority, which is focused on control of capital and investment markets, enhancing transparency, protecting investors' rights and etc. Regulatory framework allows foreign investors to contribute up to 40% of bank's paid up capital and many national banks merged with foreign ones.

In Saudi Arabia majority of banks are conventional ones with only three fully fledged Islamic banks (Al-Jazeera, Al-Bilad, and Al-Rajhi). These three are the main contributors of Islamic financial services which consist of 64 percent of total market share of financial services. Probably, it is due to the fact that almost all conventional banks have "Islamic windows".

High demand for Islamic financial services urges financial institutions to restructure their businesses. For instance, when Saudi British Bank increased the range of its Islamic services, another Saudi Investment bank opened ten new branches which were fully dedicated to work under the Islamic Laws (Arab News 2006b, p7).

Also a new bank, Al Bilad founded by the merger of eight local money exchange companies is now second largest Islamic bank of Saudi Arabia after Al Rajhi bank. The research done by Esayyad (2003) indicates that profitability of Saudi Arabian banks is correlated with oil prices and oil export of country.

United Arab Emirates

The first basement of modern Islamic retail banking was settled in UAE with the formation of Dubai Islamic Bank in 1975. Presently, the Islamic banking assets are only 10 percent of the domestic banking industry, USD 204 billion in numbers and expected growth rate is near 20 percent (Emirates Business 24/7, November 27, 2008).

Khan & Bhatti (2008) states that more than anywhere else in the world, the tendency of conventional bank's converting into Islamic banking is observed. The complete conversion of the Dubai Financial Market into an Islamic one is included in the UAE's governmental

plans. For instance, in January of 2008, starting with a paid-up capital of USD 1 billion and a staff of 400, Noor Islamic Bank was founded by UAE government through Dubai Group and Dubai Investment Corporation (The Banker 2008). Another bank named Al-Hilal was founded with capital injection of USD 1.1 billion and it's working on international level by entering Central Asian market through Kazakhstan.

The regulatory framework of Islamic banking is also well-organized. An article 1 of Federal Law No. 6 of 1985 about Islamic Financial Institutions describes Islamic banks, financial institutions and investment companies as "those companies whose Articles and Memorandum of Association include an obligation to apply the Islamic Law and that their operations would be conducted pursuant to Islamic Law".

Furthermore, the sukuk (Islamic bond) market is becoming the main source of funding real estate mortgages in UAE. The development of sukuk market in UAE is remarkable, only Dubai Islamic Bank issued sukuk worth more than US$ 9 billion in 2006, comprising almost 21 percent of global Sukuk market. Takaful (Islamic insurance) market is also growing 10 to 15 percent annually. According to World Islamic Insurance Directory figure in 2006, UAE took first place on contributing premiums (18.7 percent) of global Takaful market.

2.2.2 Islamic banking in the South Asia

The majority of world Muslim population is comprised by Pakistan, Bangladesh, India, and Afghanistan which implies the high growth potential of Islamic banking in this region. In this region, Islamic banking has been launched and is operating effectively in Pakistan and Bangladesh. However in India, only branches of Standard Chartered, HSBC, and Citibank are offering Islamic financial services. Khan & Bhatti (2008) states that, officials of Afghanistan International Bank have been working on launching a fully dedicated Islamic bank in Afghanistan.

Pakistan

The historical roots of modern Islamic banking in Pakistan go around 1980s. By the requirement of State Bank of Pakistan which performs the role of central bank all conventional banks are required to have Islamic windows on their operations. The first fully fledged Islamic bank in Pakistan, Meezan Bank formed in 2002, after State Bank of Pakistan constituted (CTFS)[23] to introduce Sharia-compliant modes of financing in January 2000. Currently there are six fully fledged Islamic banks while nine conventional banks have formed 62 branches which are focused on offering Islamic finance products.

Khan & Bhatti (2008) states that in 2006, Islamic banking held assets valued at USD 1.3 billion and its operations accounted for 2.2 per cent of the overall financial market of Pakistan. The Islamic banking deposits are expected to grow to USD 13 billion, 10 per cent of the total banking deposits in Pakistan by 2014. So, although the number and variety of operations of Islamic banks are expanding, the overall share of Islamic banking in the total banking system is still low. Pakistan is actively working on conversion of its financial industry into Islamic Finance.

Furthermore, if we consider annual growth rate of Pakistan's economy and number of its population we can see enormous opportunities which have not explored yet. However, it's difficult since Islamic banking is steadily growing in Pakistan by gaining trust of people, as compared to Middle East. Islamic banking has to promote their businesses style in order to become competent. Origination and development of Sukuk market began in 2005 when government of Pakistan issued Sukuk worth of USD 600 million.

2.2.3 Islamic Banking in the South-East Asia

More developed and growing, South East Asia is famous with its well established banking system, especially in Singapore and Malaysia. Islamic banking is becoming vital part of this liberal, integrated and competitive financial market. Islamic banking has begun to evolve in Singapore and Indonesian markets. Malaysia is also becoming the hub of global Islamic Finance market.

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[23] Commission for Transformation of Financial System

Malaysia

In Malaysia, the first Islamic bank was founded in 1983. Presently, there are 12 fully-fledged Islamic banks, 35 commercial banks with "Islamic windows", 10 commercial and 5 development banks, operating (Khan, 2008). There are many studies done on Islamic banking development, structure and performance, some of them are by Moktar et al. (2006) and Siddiqui (2008). Mokhtar et al (2008) in his research divides development of Islamic banking in Malaysia into three periods:

- First phase (1983-1992): the establishment of the first Islamic bank
- Second phase (1993-2003): the emergence of Islamic windows
- Third phase (2004 onwards): towards financial liberalization of Islamic banks

Later, he argues that the third phase was full with significant decisions and strategies for development of Islamic banking. In the third phase the international Islamic financial institutions began to launch their subsidiaries in Malaysian market.

In order to promote the establishment of sound Islamic banking systems and practices in Malaysia, in cooperation and consultation with Bank Negara Malaysia[24] and other regulatory bodies, AIBIM works closely with financial institutions. Besides the above, AIBIM promotes education and training in Islamic banking, so as to upgrade Islamic banking expertise in Malaysia. In pursuing the above objectives the Association works in co-operation with other similar associations in the country and elsewhere in the world (Source: AIBIM).

2.2.4 Islamic Banking in Europe

Islamic banking has been promoted in Europe by big international banks like Citibank, HSBC, Goldman Sachs, Deutsche Bank etc. The first appearance of Islamic finance in Europe was with the opening of Faisal Finance in Geneva in mid of 1970s. Today, banks from the Middle East are operating their branches in United Kingdom. Among all of the European countries, Islamic banking is more developed in UK.

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[24] Malaysia Central Bank

United Kingdom

The first steps of Islamic finance came to UK in 1982 with foundation of Al-Baraka International Bank in London by Al-Baraka Investment Company. The first fully fledged Islamic bank in UK was established in 2004, named Islamic Bank of Britain. The bank started operations in September 2004, catering to the needs of Britain's Muslims in the retail Islamic banking market by offering current, savings, and treasury accounts, and personal finance arrangements.

It entered the Islamic mortgage market when HSBC opened HSBC-Amanah in 2004 and Lloyds TSB in March 2005 (Wilson 2005). Also, in the middle of 2006 a newcomer, Bank of London and The Middle East joined the Islamic banking market, and became leading European Sharia-compliant bank in terms of capitalization and profitability in a short time. Additionally to Islamic banks from the Middle East, the big conventional banks like Citibank, HSBC, Lloyds TSB, and Barclays Capital are offering Islamic financial services as well as traditional ones. The well established regulatory system, close time zone to the Middle East is increasing chances of being leading European financial hub for Islamic banking.

The London-based trading or merchant banks had the added advantage of direct involvement and penetration of a very mature trade finance market. They also had the scale of in-house resources to handle all the necessary aspects of negotiation, documentation and administration, including the legal and taxation issues relating to individual structures. London's attractions to the major Islamic banks are mainly due to the breadth of specialist financial services offered, the depth of the markets and the reputation of the major banks, which include all the leading international financial institutions (Hassan & Lewis 2007).

Appendix 6

(Current Financial Crisis)

Origins and Spread of financial crisis

Outline of today's newspapers, the financial crisis, reached its height in October 2008. The bankruptcy of famous Lehman Brothers was a contributing factor, signaling the seriousness of the most precarious economic downturn of decades. The turbulence began in US market and immediately spread all over Europe since both are engaged with "toxic" and complex derivatives. The nationalization of huge corporations and banks by governments became common practice. Table 6-A shows the list of notable financial institutions rescued by government.

Table 6-A

(Recent failures of financial institutions)

Date and country	Event	Fiscal Cost
7 February 2008 – UK	Northern Rock was nationalized	£88 billion
14 March – USA	Bear Stearns absorbed by a commercial bank following a significant Federal Reserve subsidy	$29 billion
7 September – USA	Freddy Mac and Fannie Mae were de facto Nationalized	$200 billion
15 September – USA	Lehman Brothers filed for bankruptcy protection	
29 September – Belgium	Fortis rescued	$87 billion
29 September – USA	Wachovia bought by Citibank	€16 billion
29 September – Germany	Hypo Real Estate rescued	$ 12 billion
29 September – Iceland	Glitnir rescued	$ 71 billion
29 September – UK	Bradford & Bingley rescued	$ 850 million
30 September – Belgium	Dexia rescued	$ 32.5 billion
7 October – Iceland	Lansbanki nationalized	$ 9.2 billion
16 October – Switzerland	UBS rescued	$864 million
19 October – Netherlands	ING rescued	$ 59.2 billion
20 October – France	French government lent money to 6 large banks	€10 billion
27 October – Belgium	KBG	€10.5 billion

(Source: Furceri and Mourougane, 2009)

"The current crisis is characterized by two distinct phases: a period of financial turmoil and limited spreading from July 2007 to 15 September 2008, followed by a total collapse of

confidence phase, spreading the crisis throughout the globe. The policy response differed between these two phases. Authorities started by adopting a piecemeal approach, focused on conventional policy measures and ad hoc interventions. However, given that these failed to shore-up confidence in the markets, more concerted and systemic rescue packages were subsequently introduced worldwide. The first phase of the crisis started when a moderate correction of house prices in the United States triggered a modest increase in mortgage debt delinquencies and a few failures of financial institutions holding mortgage-backed securities (MBS) or related instruments in 2007.

The global money market crisis intensified in the autumn and quickly developed into a full-blown credit crunch in the United States and Europe. Bond and loan markets collapsed during the second week of September, both in the United States and in major financial centers and the costs of unsecured overnight interbank borrowing surged. Commercial paper funding contracted. Stock prices sharply fell and interbank spreads climbed. Uncertainty led to a flight to quality and heightened default risk, as evidenced by long-term debt default risk spreads and falling Treasury bond yields. Strains spread rapidly outside the banking sector, in particular to pension funds and hedge funds. Credit volume data were difficult to reconcile with these developments in the United States. Indeed, US bank lending to non-financial firms expanded markedly in late September and early October, and interbank lending volumes held up well through September" (Furceri &Mourougane, 2009).

"The securitization of mortgage loans spread from the mortgage industry to commercial paper issuance, student loans, credit card receivables, and other loan categories. The design of mortgage-backed securities collateralized by a pool of mortgages assumed that the pool would give the securities value. The pool, however, was an assortment of mortgages of varying quality. The designers gave no guidance on how to price the pool. They claimed that rating agencies would determine the price of the security. But the rating agencies had no formula for this task. They assigned ratings to complex securities as if they were ordinary corporate bonds and without examining the individual mortgages in the pool. Ratings tended to overstate the value of the securities and were fundamentally arbitrary.

Absent securitization, all the various peripheral players in the credit market debacle including the bond insurers, who unwisely insured securities linked to subprime mortgages, would not have been drawn into the subsidiary roles they exploited."[25] The expansion of these products had contributed and supported further development of crisis. Rather than holding them financial institutions steadily sold them into capital market, which was transferring risks to other participants of market.

The complexity of financial system and new innovative financial derivatives like credit default swaps (CDSs), collateralised debt obligations (CDOs), backed both by cash instruments, loans or asset-backed securities could not eliminate credit risk. Instead they tend to produce steady streams of returns in good times, but can result in heavy losses in bad times. In other words, their sensitivity to the more systematic aspects of the business cycle, such as asset prices and incomes, can be quite high, but cannot be perceived by investors for typical variations in the underlying variables in good times, as it is highly asymmetric and subject to strong threshold effects. Otherwise stated, they can have high "embedded leverage" (Borio 2008)

This leads us to the lack of regulatory framework which encouraged the spreading process of financial turmoil. Financial institutions, including banks, mutual funds, pension funds, insurance companies limited themselves to maintain low leverage ratios as a requirement from Basel I and Basel II. Moreover, comprehensive regulations for off-balance sheet vehicles were inexistent (in US) or inadequate (in UK).

3.2. Effects of financial crisis on the world economy

While financial downturn has reached the developing countries, the situation in the Europe and US has worsened. The growth of GDP significantly declined (7,5 percent) in fourth quarter of 2008 in advanced economies, according to IMF world economic outlook. Although US economy more suffered from fall of GDP, developed countries from Asia and Western Europe significantly hit by the collapse of world trade as well as financial distress at capital markets. The bailout packages of only some selected governments in order to stimulate economy consisted more than US$ 3.5 trillion (Table 6-B).

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[25] Anna J. Schwartz 'Origins of the Financial Market Crisis of 2008"

Table 6-B

(Rescue packages of selected governments in 2008)

Country	*Capital injection*	*Guarantees*	*Total measure announced (*)*	*Total (% of GDP)*
United States	$ 250 billion		$ 700 billion	5.1
Germany	€ 70 billion	€ 400 billion	€ 470 billion	19.8
France	€ 40 billion	€ 320 billion	€ 380 billion	19
Italy			€ 40 billion	2.6
United Kingdom	£ 50 billion	£ 250 billion	£ 400 billion	28.6
Canada			CAD 75 billion	4.8
Austria	€ 15 billion	€ 85 billion	€ 100 billion	36.9
Denmark			Kr 35 billion	2.1
Greece	€ 5 billion	€ 15 billion	€ 28 billion	11
Ireland		€ 450 billion	€ 450 billion	258.7
Hungray	$ 3 billion			
Korea		$ 100 billion	$ 100 billion	
Netherlands		€ 200 billion	€ 200 billion	
Portugal		€ 20 billion	€ 20 billion	6.1
Sweden	SEK 15 billion	SEK 1500 billion	SEK 1515 billion	50.5
Switzerland			SFR 60 billion	
Spain	€ 50 billion	€ 100 billion	€ 150 billion	14.3

Note: While from an economic point of view the announced plans represent a gross fiscal cost, from a statistical and accounting point of view they may not have any impact on the current net debt or budget balance. In fact, some of these measures such as capital injections if treated as a financial transaction (*i.e.* the government receives in return a financial asset of equal value to the payment like in the TARP), would affect neither the net debt nor the budget balance. In contrast, they will have an impact on the net fiscal balance and debt if treated as a non-financial transaction (*i.e.* if the government does not receive in return a financial asset of an equal value).

(*)This total is in some case the sum of measures of which a cost estimate is available up to December 2008.

Source: Furceri, D. and A. Mourougane (2009)

It's observed that commodity market prices fell dramatically from the midyear peak levels. Thus, it significantly influenced to economies of Commonwealth of Independent Countries and the fastest growing market-the Middle East which commodity based economies. This fall

also brought big losses to many other exporters from Latin America and Africa. The fluctuations of commodity market indexes can be seen in the following figure.

Figure 6-A

(Commodity Prices)
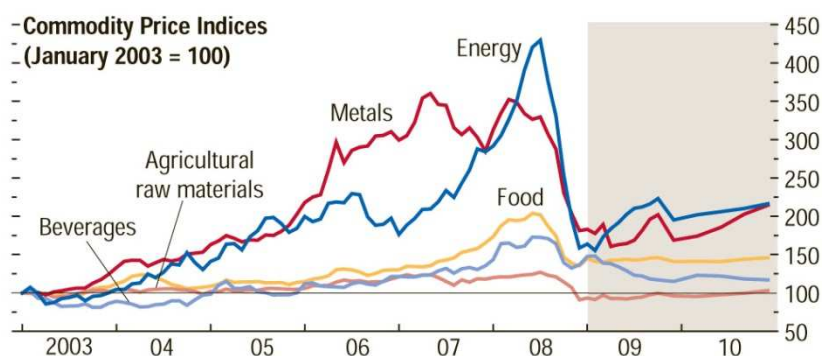
(Source: IMF 2009)

The write downs and losses by banking sector are comprises big numbers, according to IMF report (April, 2008) total write-downs could reach $4 trillion over the next two years, iincluding assets originated in other mature market economies, approximately two-thirds of which may be taken by banks. $2.7 trillion or more than half of total write downs are expected by U.S.-originated assets by all financial institutions over 2007–10. IMF (2008) projects that the amount of capital needed might amount to $275 billion–$500 billion for U.S. Banks, $475 billion–$950 billion for European banks (excluding those in the United Kingdom), and $125 billion–$250 billion for U.K. Banks.

As a respond to global meltdown the monetary authorities have been cut interest rates sharply in order to maintain incentives for capital flows in financial institutions. On 8th October in 2008, The US Federal Reserve, The European Central Bank, The Bank of Canada, the Bank of England, Sveriges Riksbank, and the Swiss National Bank jointly announced reductions in policy interest rates. Later, this policy was followed by countries in Asia, in particularly in China, and in Australia (WSJ[26] 2008). The hybrid economy of India, also decided to change the policy for interest rate and reserve requirements and large liquidity injections have eased

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[26] Wall Street Journal (WSJ)

pressure in money markets. In fact, almost each economy interest rates are likely close to zero, but real interest rates required by investors tend to be higher due to high volatility of asset prices.

Global GDP growth, after a robust eight-year stretch, is now set to contract by 1.7 percent this year, the World Bank predicts. This is a historic contraction, with world output set to decline for the first time since World War II. Detailed information about economic indicators is given in figures 6-B, 6-C & 6-D.

Figure 6-B

(Advanced Economies: Real GDP, Consumer Prices, and Unemployment)
(Annual percent change and percent of labor force)

|	Real GDP				Consumer Prices[1]				Current Account Balance[2]			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Middle East	**6.3**	**5.9**	**2.5**	**3.5**	**10.5**	**15.6**	**11.0**	**8.5**	**18.2**	**18.8**	**−0.6**	**3.2**
Oil exporters[3]	**6.2**	**5.6**	**2.2**	**3.7**	**10.9**	**16.7**	**10.3**	**8.8**	**21.9**	**22.5**	**0.2**	**5.0**
Iran, I.R. of	7.8	4.5	3.2	3.0	18.4	26.0	18.0	15.0	11.9	5.2	−5.2	−3.6
Saudi Arabia	3.5	4.6	−0.9	2.9	4.1	9.9	5.5	4.5	25.1	28.9	−1.8	4.5
United Arab Emirates	6.3	7.4	−0.6	1.6	11.1	11.5	2.0	3.1	16.1	15.8	−5.6	−1.0
Kuwait	2.5	6.3	−1.1	2.4	5.5	10.5	6.0	4.8	44.7	44.7	25.8	29.3
Mashreq	**6.7**	**6.9**	**3.4**	**3.1**	**9.1**	**12.2**	**13.4**	**7.5**	**−1.9**	**−2.7**	**−4.4**	**−5.3**
Egypt	7.1	7.2	3.6	3.0	11.0	11.7	16.5	8.6	1.4	0.5	−3.0	−4.1
Syrian Arab Republic	4.2	5.2	3.0	2.8	4.7	14.5	7.5	6.0	−3.3	−4.0	−3.1	−4.4
Jordan	6.6	6.0	3.0	4.0	5.4	14.9	4.0	3.6	−16.8	−12.7	−11.2	−10.6
Lebanon	7.5	8.5	3.0	4.0	4.1	10.8	3.6	2.1	−7.1	−11.4	−10.5	−10.0
South Asia[4]	**8.7**	**7.0**	**4.3**	**5.3**	**6.9**	**9.0**	**7.7**	**4.5**	**−1.4**	**−3.4**	**−2.6**	**−2.7**
India	9.3	7.3	4.5	5.6	6.4	8.3	6.3	4.0	−1.0	−2.8	−2.5	−2.6
Pakistan	6.0	6.0	2.5	3.5	7.8	12.0	20.0	6.0	−4.8	−8.4	−5.9	−4.9
Bangladesh	6.3	5.6	5.0	5.4	9.1	8.4	6.4	6.1	1.1	0.9	0.9	−0.1
ASEAN–5	**6.3**	**4.9**	**0.0**	**2.3**	**4.3**	**9.2**	**3.6**	**4.5**	**4.9**	**2.8**	**2.2**	**1.5**
Indonesia	6.3	6.1	2.5	3.5	6.0	9.8	6.1	5.9	2.4	0.1	−0.4	−0.7
Thailand	4.9	2.6	−3.0	1.0	2.2	5.5	0.5	3.4	5.7	−0.1	0.6	0.2
Philippines	7.2	4.6	0.0	1.0	2.8	9.3	3.4	4.5	4.9	2.5	2.3	1.6
Malaysia	6.3	4.6	−3.5	1.3	2.0	5.4	0.9	2.5	15.4	17.4	12.9	10.7
Vietnam	8.5	6.2	3.3	4.0	8.3	23.1	6.0	5.0	−9.8	−9.4	−4.8	−4.2

- Movements in consumer prices are shown as annual averages.
- Percent of GDP.
- Includes Bahrain, Islamic Republic of Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, United Arab Emirates, and Republic of Yemen.
- Includes Maldives, Nepal, and Sri Lanka

(Source: IMF, 2009)

Appendix 6-C

(Global Indicators)
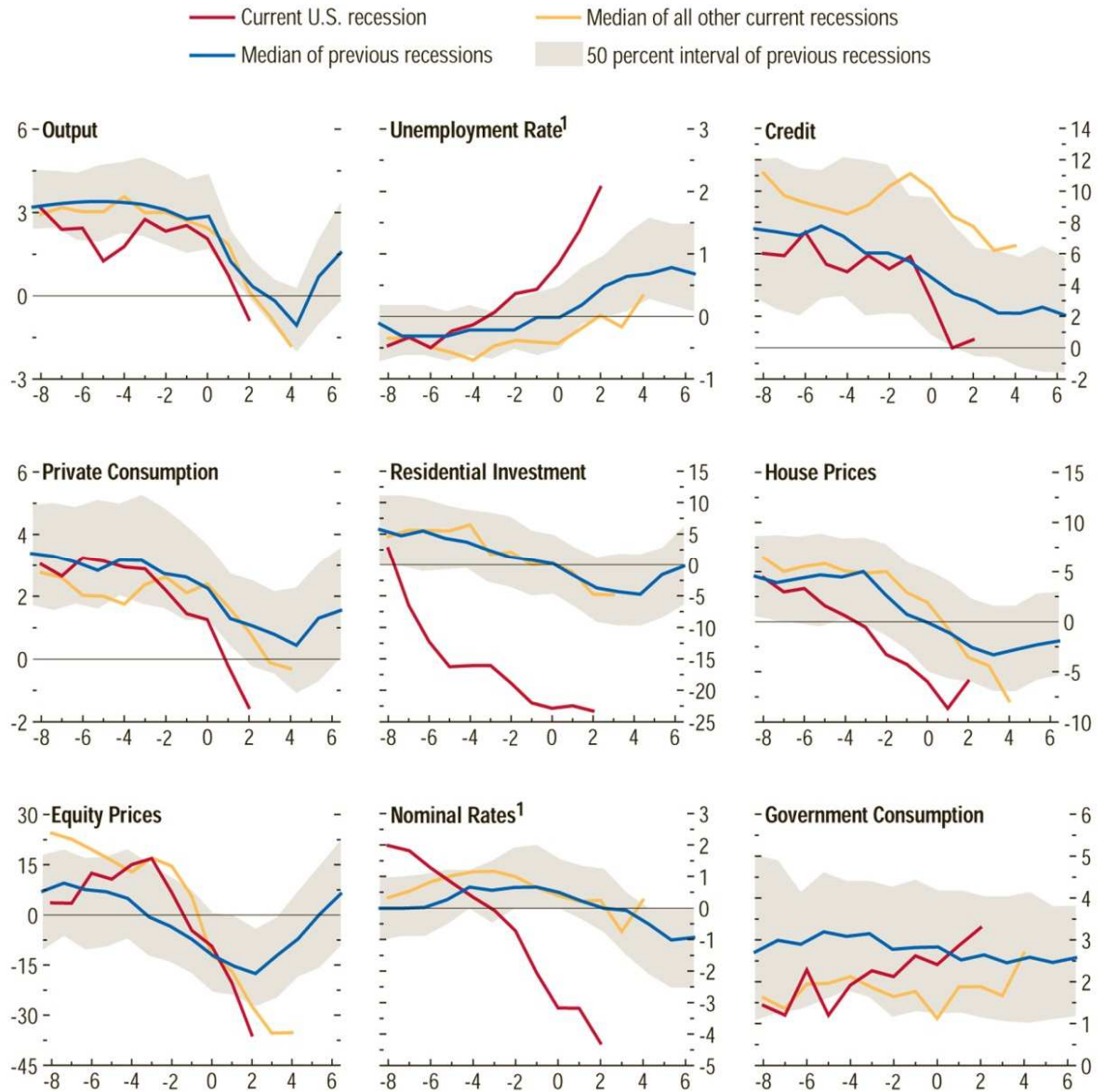(Annual percent change unless otherwise noted)
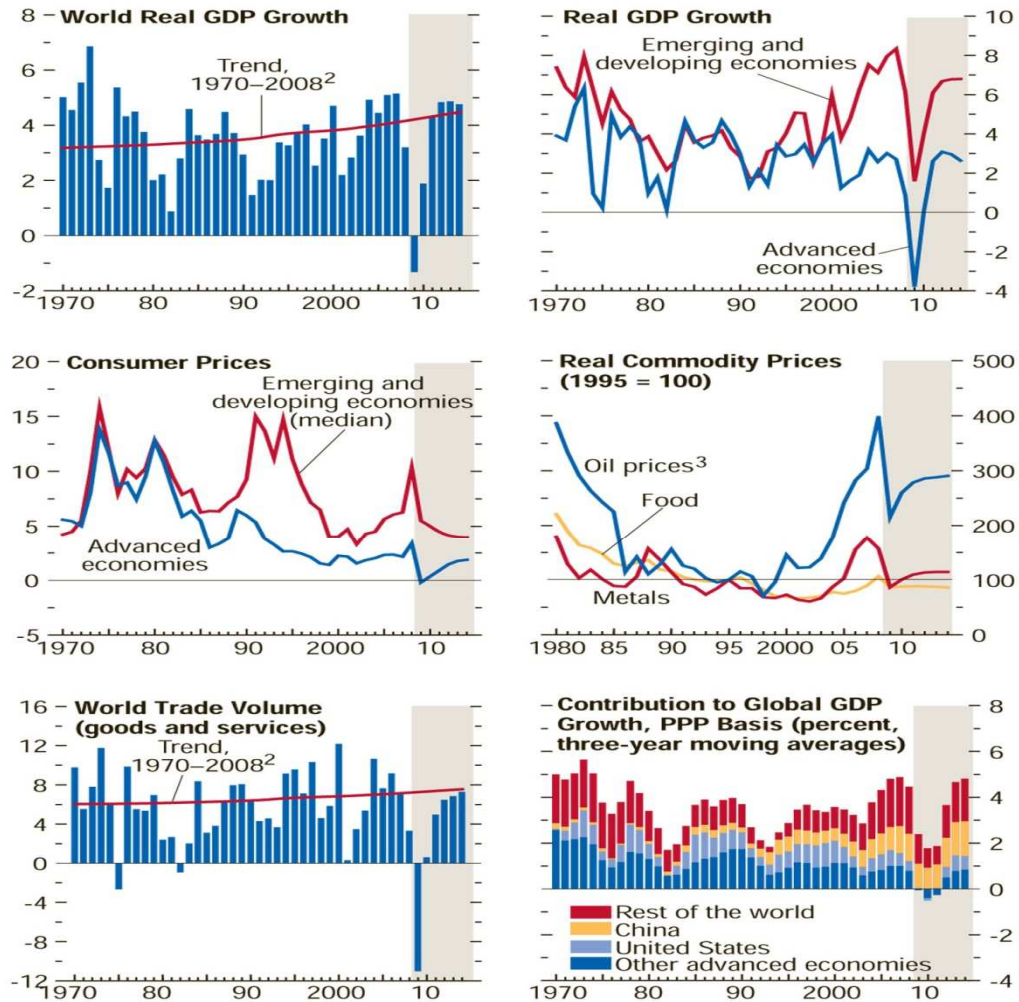
1 Shaded areas indicate IMF staff projections. Aggregates are computed on the basis of purchasing-power-parity (PPP) weights unless otherwise noted.

2 Average growth rates for individual countries, aggregated using PPP weights; aggregates shift over time in f avor of faster-growing economies, giving the line an upward trend.

3 Simple average of spot prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil.

(Source: IMF 2009)

Figure 6-D

(Economic Indicators around Peaks of Current and Previous Recessions)
(Median log differences from one year earlier unless otherwise noted; peak in output at t = 0;
data in real terms unless otherwise noted; quarters on the x-axis)

(Source: IMF 2009)