Ethical Banking and Finance: A Theoretical and Empirical Framework for the Cross-Country and Inter-Bank Analysis of Efficiency, Productivity, and Financial Performance

Ahmad M. Abu-Alkheil

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This thesis was accepted as a doctoral dissertation in fulfilment of the requirements for the degree of Doctor (Ph.D.) of Economics and Business Administration Sciences (Dr.Oec) "Banking and Financial Studies" by the faculty of Business, Economics, and Social Sciences at the University of Hohenheim on July 2, 2012.

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Date of the Doctoral oral examination (Dissertation Defenses):
July 17, 2012

DECLARATION

I, Ahmad M. Abu-Alkheil, declare that this thesis is solely and originally my own work other than where I have clearly indicated that it is the work of others or carried out jointly by me and any other person. This thesis is being submitted for the degree of Doctor of Economic and Business Administration Sciences (Dr. Oec)-Banking and Financial Studies at the University of Hohenheim, Stuttgart-Germany. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree.

Stuttgart, den 01.01.2012

ACKNOWLEDGEMENT

After all these years of hard work, it is necessary to express my gratitude to those people who in one way or another contributed and extended their support and valuable assistance in the preparation and completion of this academic work.

First and foremost, my utmost gratitude to the one above all of us, the omnipresent only God, for giving me the strength to plod on despite my desire to give up, thank you so much my Allah, (the) One. I would also like to heartily thankful to my supervisor Prof. Dr. Hans-Peter Burghof, whose encouragement, supervision and moral and unfailing support, from the preliminary to the concluding level, enabled me to develop an understanding of my thesis.

Additionally, I want to show and offer my regards, gratitude and blessings to Prof. Walayet A. Khan, from the University of Evansville–USA, who has shared valuable insights in the relevance of the study despite of the distance. Prof. Khan has closely and jointly worked with me and my supervisor as a third co-author in (my) three proposed research papers.

I am really very much and sincerely grateful to the hidden support of my father's soul, my great mother, my patient and lovely wife, and not to forget my little angel "Eleen" and my son "Elias", who have been my inspiration as I hurdle all the obstacles in the completion of this work.

I am ultimately thankful to the German Jordanian University (GJU) for providing me with a scholarship to help me to pursue this post-graduate study in Islamic banking and finance.

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LIST OF ABBREVIATIONS AND VARIABLES

AAOIFI	Accounting and Auditing Organization for Islamic Financial Institutions
ABC	Arab Banking Corporation
ABCIB	Arab Banking Corporation- International Bank plc
AE	Allocative Efficiency
AED	United Arab Emirates dirham
AFP	Agence France-Presse
AIBIM	Association of Islamic Banking Institutions Malaysia
AIM	Alternative Investment Market
AIMS	Academy for International Modern Studies
AMF	The Autorité des Marchés Financiers
ARM	Adjustable Rate Mortgages
AU	Asset utilization ratio
BaFin	The Federal Financial Supervisory Authority- Germany
BBI	Bosnia Bank International
BCC	Banker, Charnes, and Cooper DEA-model
BiH	Bosnia and Herzegovina
BIMB	Bank Islam Malaysia Berhad
BIS	The Bank for International Settlements
BKME	Bank of Kuwait and Middle East
BLME	Bank of London and Middle East
C	Total costs of a bank
CA	Current ratio
CAGR	Compound Annual Growth Rate
CAR	Current asset ratio
CBB	Central bank of Bahrain
CDO	Collateralized Debt Obligations
CDO2	Collateralized Debt Obligation Squared
CE	Cost Efficiency
CFIs	Conventional financial institutions
CHF	Swiss franc
CIS	Commonwealth of Independent States
C_O	Conventional banks
CPI	Consumer Price Index
CRS	Constant Returns to Scale
CU	Catching-Up
DB	Deutsche Bank
DEA	Data Envelopment Analysis
DEAP	Data Envelopment Analysis Program
DER	Debt equity ratio
DFA	Deterministic Frontier Approach
DIB	Dubai Islamic bank
DIB	Dubai Islamic Bank
DJIM	Dow Jones Islamic market index
DJIM	The Dow Jones Islamic Market World Index
DMU	Decision Making Unit
D_o	Distance from the period (t+1) observation to the period (t)

DRS	Decreasing Return to Scale
DTAR	Debt to total assets ratio
E&Y	Ernst and Young
EF	Efficiency Frontier
EFch	Efficiency Changes
EFH	European Finance House
EIIB	European Islamic Investment Bank
EM	Equity multiplier ratio
EMTN	The European Medium Term Note
ER	Equity Ratio
e_s	PTE
ES	Economies of Scale
ESBG	European Savings Banks Group
ETF	Exchange-Traded Funds
EU	European Union
FA	Fixed Assets
FDH	Free Disposable Hull
FFS	Faisal Finance (Switzerland)
FPB	Faisal Private Bank
FRA	Financial Ratios Based Analysis
FSA	Financial Services Authority
FTSE	Financial Times and the London Stock Exchange
GCC	Gulf Corporations Council
GDP	Gross domestic product
GFH	Gulf Finance House
GIC	Government Investment Certificate
GIIS	Global Islamic Index Series
GMB	Global Market Briefings
H	Hypothesis
h^o	Efficiency performance
HSBC	The Hongkong and Shanghai Banking Corporation
IAB	Islamic Accepted Bills
IBB	Islamic Bank of Britain
ICD	Islamic Corporation for the Development of the Private Sector
IDB	Islamic Development Bank
IER	Income Expense Ratio
IFIBAF	Institute for Islamic Banking and Finance
IFIs	Islamic financial institutions
IFSB	Islamic Financial Services Board
IFSL	International Financial Services London
IIBs	Islamic investment banks
I_n	Investment banks
IPO	Initial Public Offering
IRS	Increasing Return to Scale
I_S	Islamic banks
JDIB	Jordan Dubai Islamic Bank

KD	Kuwaiti Dinars
KIB	Kuwait International Bank
KIB	Kuwait International Bank
LAR	Loan to Asset Ratio
LCB	Large Conventional Bank
LFS	Labour Force Survey
LIB	Large Islamic Bank
LIBOR	London Interbank Offered Rate
LLP	Limited liability partnership
LSE	London Stock Exchange
LTA	Long term loan ratio
M_1	DEA-Model 1
M_2	DEA-Model 2
M_3	DEA-Model 3
M_4	DEA-Model 4
MBS	Mortgage-Backed Securities
MENA	Middle East and North Africa
M_o	Output-based MPI between time periods (t) and (t + 1)
MPI	Malmquist Productivity Index
MS	Multi-stage DEA
MTI	Masonry Technologies Inc.
MUP	The mark-up principle
NBA	National Bank of Azerbaijan's
NBK	National Bank of Kuwait
OE	Operating efficiency ratio
OIC	Organization of the Islamic Conference
OLS	Ordinary Least Squares
ONS	Office for National Statistics
PCFC	Ports, Customs & Free Zone Corporation
PER	Profit to Total Expenses
PLS	Profit-and-Loss Sharing
P*r*.	Private Banks
PTE	Pure Technical Efficiency
PTEch	Pure Technical Efficiency Change
QIIB	Qatar International Islamic Bank
QIIC	Qatar Islamic Insurance Company
RBS	Royal Bank of Scotland
ROA	Return on Assets
ROE	Return on Equity
RTS	Return to Scale
S.A.W.	The Arabic version of "Peace and Blessings Upon Him"
S&P	Standard & Poor’s
SCB	Small Conventional Bank
SDLT	Stamp Duty Land Tax
SE	Scale Efficiency
SEch	Scale Efficiency Changes

SFA	Stochastic Frontier Approach
SGAM	The Société Générale Asset Management
SIB	Sharjah Islamic Bank
SIB	Small Islamic Bank
SSB	Shari'ah Supervisory Board
t+1	Period t+1
TE	Technical Efficiency
TEch	Technical Efficiency Change
TFA	Thick Frontier Approach
TFP	Total Factor Productivity
TFPch	Total Factor Productivity Change
TECch	Technological (innovation) change
UAE	United Arab Emirates
u_i	The output weight
UK	United Kingdom
u^o_j	The outputs weights
v_j	The input weight
v^o_i	The inputs weights
VRS	Variable Returns to Scale
w_i	Vector of input prices
$W\text{-}I_n$	Wholesale Investment
WSBI	World Savings Banks Institute
x_i^*	The cost-minimizing vector of input quantities for the "i_{th}" DMU
X_{js}	The quantity of the jth input used by a DMU
x^n_i	Inputs of the n_{th} DMU
y_{is}	The quantity of the ith output produced by a DMU
y^n_j	Outputs of the n_{th} DMU
Z	The quantities of fixed bank parameters (bank capital and fixed assets)
$\beta_1 BP_{jt}$	Profitability= net income / total assets
$\beta_2 PER_{jt}$	Personal expenses = total amount of wages and salaries / total assets
$\beta_3 LIQ_{jt}$	Liquid assets / total deposits and short term funding
$\beta_4\ LOG(A)_{jt}$	The logarithm of total assets as a proxy of a banks size
$\beta_5 LTA_{jt}$	The proxy of lending intensity= total Loans / total asset
$\beta_6\ DEPO_{jt}$	Total deposits as a proxy of banks market share
$\beta_7\ Ind_{jt}$	Dummy variable- independency
$\beta_8\ AGE_{jt}$	Dummy variable- age
$\beta_9 LEV_{jt}$	Financial leverage= total assets / equity
$\beta_{10} DIVER_{jt}$ *(1)*	Dummy variable -Diversification effect
$\beta_{10} GDP_{jt}$ *(2)*	The percentage change in gross domestic production per capita
$\beta_{11} GEO_{jt}$	Dummy variable -Geographical location effect
$\beta_{12} ISLAM_{jt}$	Dummy variable - religion
ε	Error term
θ	Efficiency Scores
λ	(N × 1) vector of constants
ξ_s	Overall Technical Efficiency

ABSTRACT

Islamic banking is a growing worldwide phenomenon involving a variety of institutions and instruments. Previously, Islamic banks' transactions made up a small part of the total banking industry. Recently, Islamic banks have significantly expanded their network, and have been able to mobilize a large amount of funds and upgrade many economic ventures. Given the unique behavior of Islamic banks and their involvement in both social and economic activities, there has always been a question about their long run financial sustainability, particularly in adverse market conditions. Thus, a reliable and unbiased estimation of Islamic banks'efficiency and productivity performance is essential for the evaluation of Islamic banking operations within and outside its traditional borders of Muslim economies.

Due to the short history of Islamic banking in Europe, and consequently the lack of sufficient data, empirical researches on the financial performance of Islamic banking have concentrated primarily in Muslim-majority countries and focused on the theoretical issues and descriptive statistics rather than rigorous statistical and econometric estimation. The main purpose of our analysis is to bridge this gap in the global and cross-country literature and to contribute to the ongoing debate regarding the performance of Islamic banking. Therefore, the orientation of this thesis is chiefly quantitative in nature.

The aim of this thesis is primarily to shed some light on the emergence and the continual global growth of Islamic banking all over the world. It also tries to assess, for the first time, the relative performance of Islamic commercial and investment banks operating in Europe against counterparties-conventional banks in Europe and also against Islamic banks from Muslim-majority countries. Our methodology in this academic work clearly differs from the literature researches. This thesis is, basically, divided into two main parts. In first part, we specifically discuss the basic features and principles of the Islamic banking and finance. We then reviewed several in-depth market analysis results concerning Islamic banking and finance that were performed by well-known specialized financial institutions. In the second part, we primarily utilize different empirical approaches to examine the performance of our sample banks which shows a great variety, ranging from large active banks to new and small banks. More specifically, we use the Data Envelopment Analysis (DEA) method to calculate the commercial banks' efficiency scores and investment banks (cost)-X-efficiency levels; the DEA-based Malmq-

uist Productivity Index (MPI) to estimate the banks productivity indices; the common financial ratios to measure the banks financial performance; the T-Test to determine the differences of investment bank's performance pre- and post- the financial crisis that hit the world's economy in 2007; the Ordinary Least Squares (OLS)-regression to determine the impact of internal and external factors on bank's efficiency and also to check the robustness of the overall results obtained from DEA scores; Spearman's rho correlation to investigate the association of the DEA-efficiency scores with the traditional accounting ratios; and eventually the efficiency–profitability matrix in order to determine the characterization of the banks' performance and the factors that influence efficiency. Our analysis is carried out, primarily, over the period from 2005 to 2008. This indeed helps to account for the impact of the recent financial crisis on the efficiency and productivity performance of the selected banks.

The preliminary review of the market surveys-based analysis shows that the Islamic finance and banking is one of the fastest growing sectors in the financial world. Islamic financial products and services are increasingly being regarded as a viable investment opportunity, making them very attractive for Muslims and non-Muslims alike. Leading Islamic banks from Muslim countries are expanding their network. Several European banks have directly involved in providing Islamic financial products in order to satisfy the special needs for Muslim customers and the non-Muslims who seek ethical financial and investment solutions. Eventually, European governments have also started to amend their legal, tax, and regulatory systems to allow the establishment of Islamic banks.

Most importantly, from an empirical point of view, our presented results suggest that the Islamic commercial banks in Europe are found to be relatively technically inefficient. They have also, on average, poor financial performance and under-performing practices. Moreover, Islamic banks in Europe actually suffer from significant productivity losses over the sample years driven, to a large extent, by the regress in banks' technology innovations. By and large, the bank's inefficiency stems from both the sub-optimal size of operations and the lack of management knowledge and skills. Findings suggest that the optimal size for Islamic banks to achieve better levels of performance is neither large nor small rather medium. Therefore, increasing banks size through mergers and acquisition will substantially enhance their technical efficiency and productivity progress.

The period prior to the current financial crisis was marked by the most stable economic environment for generations. Our results illustrate that Islamic banks lag relatively, before the emergence of the crisis, behind their conventional peers in terms of estimated efficiency scores and productivity changes. Strikingly, conventional banks gradually lose their superiority over Islamic banks in subsequent years, but remain, on average, a head of Islamic banks. Islamic banks are, indeed, less vulnerable to the effects of the crisis as compared with counterparties-conventional banks. They exhibit only slight inefficiency and productivity regress during this severe crisis and therefore, produce a consistent and remarkable positive trend in technical efficiency, productivity performance, and financial profitability. This might be because of the beliefs in the power of petro-dollars in the Gulf region, the fact that the Islamic banks are relatively small and young at present, and could also be due to the religious financial constraints. Such factors might have played an important role in preventing Islamic banks from being severely affected by the crisis. Overall, results suggest that the small and new Islamic banks in Europe can be as efficient and productive as large and old Islamic and conventional banks. They also have long run sustainability, substantial room for improvements, and a great potential in the banking industry to sustain their competitive edge not only in Muslim countries but also in the European financial system.

The estimated findings pertaining to the performance of Islamic investment banks in Europe suggest that these banks experience low (cost)-x-efficiency and poor allocative-efficiency compared with counterparties-conventional banks. Bank’s inefficiency is caused largely by the under-utilization of inputs, the bank's diseconomies of scale, and also appears to be due to the regulations not controlled by management due to fluctuations and instability in factor prices. Islamic investment banks additionally show a clear paradox between their high calculated efficiency scores and low achieved profitability ratios. They are also less risky, more solvent, and operate with lower use of debt. Nevertheless, Islamic investment banks suffer a gradual deterioration in liquidity position. The banks' supply of Murabaha (cost-plus loans) financing appears to be most dominant and has increased significantly in importance.

Overall, findings seem to reveal that the banks that are technically more efficient are larger in size (total assets), financially more profitable, have greater loans intensity, acquire lower levels of debt, invests more in appropriate human skills, have a lower market share (total deposits), and operate in countries with higher GDP-per capita. Such results reflect the strong and high associat-

ion between the DEA-efficiency measures and the standard accounting measures, suggesting that the DEA approach can be adopted separately or concurrently along with financial ratios to make comparisons of Islamic banks performance more robust.

ZUSAMMENFASSUNG DER DISSERTATION

Das Islamische Bankwesen ist ein weltweit wachsendes Phänomen mit einer Vielzahl von Institutionen und Instrumenten. In der Vergangenheit bildeten die Islamischen Bankgeschäfte einen kleinen Teil der gesamten Bankindustrie. In letzter Zeit haben Islamische Banken ihr Netzwerk jedoch erheblich erweitert und konnten eine Vielzahl an Geldmitteln mobilisieren und viele wirtschaftliche Vorhaben verbessern. Angesichts des außergewöhnlichen Verhaltens der islamischen Banken und ihrer Beteiligung an sozialen und wirtschaftlichen Aktivitäten wurde ihre langfristige Wirtschaftlichkeit häufig in Frage gestellt, insbesondere bei ungünstigen Marktbedingungen. Somit ist eine zuverlässige und neutrale Einschätzung der Effizienz und Produktivitätsentwicklung der islamischen Banken für die Bewertung ihrer Operationen innerhalb und außerhalb traditioneller Grenzen islamischer Volkswirtschaften erforderlich. Aufgrund der noch jungen Geschichte des islamischen Bankwesens in Europa und dem einhergehenden Mangel an Daten haben sich empirische Forschungen über die finanzielle Leistungsfähigkeit des islamischen Bankwesens in erster Linie auf Länder mit muslimischer Mehrheit und theoretische Fragen sowie deskriptive Statistiken anstelle von ökonometrischen Methoden konzentriert. Das Hauptziel unserer Analyse ist es diese Lücke in der globalen und länderübergreifenden Literatur zu überbrücken und zu der laufenden Debatte über die Leistungsfähigkeit islamischer Banken beizutragen. Folglich ist die Ausrichtung dieser Dissertation in erster Linie quantitiver Natur.

Das Ziel dieser Dissertation ist es etwas Licht in die Entstehung und in das kontinuierliche globale Wachstum des islamischen Bankwesens zu bringen. Die Dissertation versucht außerdem, zum ersten Mal überhaupt, die relative Leistungsfähigkeit der in Europa tätigen islamischen Geschäfts- und Investmentbanken im Vergleich zu konventionellen Banken und zu islamischen Banken in Ländern mit muslimischer Mehrheit zu beurteilen. Die Methodik dieser wissenschaftlichen Arbeit unterscheidet sich deutlich von der Literaturrecherche. Im Grunde ist diese Dissertation in zwei Hauptteile gegliedert. Im ersten Teil werden die grundlegenden Merkmale und Grundsätze des islamischen Bank- und Finanzwesens besprochen. Daraufhin werden mehrere tiefgründige Ergebnisse von Marktanalysen, welche von nahmhaften spezialisierten Finanzinstituten durchgeführt worden sind und das islamische Bank-und Finanzwesen betreffen, überprüft. Im zweiten Teil verwenden wir in erster Linie verschiedene empirische Ansätze, um die Leistung der von uns gewählten Banken zu untersuchen. Diese sind

sehr vielfältig und reichen von Großbanken bis hin zu kleinen neuen Banken. Genauer gesagt verwenden wir die Data Envelopment Analysis (DEA)-Methode, um die Effizienz-Ergebnisse der Geschäftsbanken und die (Kosten)-X- Effizienzlevel der Investmentbanken zu berechnen; den auf DEA-basierenden Malmquist Produktivitätsindex (MPI) um die Produktivitätsindizes der Banken zu schätzen; die gängigen Finanzkennzahlen um die finanzielle Leistungsfähigkeit der Banken zu messen; den T-Test, um die Unterschiede der Leistungsfähigkeit der Investmentbanken vor und nach der Finanzkrise, welche die Weltwirtschaft im Jahr 2007 getroffen hat, zu bestimmen; die Ordinary Least Squares (OLS)–Regression, um die Auswirkungen von internen und externen Faktoren auf die Effizienz von Banken zu bestimmen, aber auch um die Robustheit der generellen Ergebnisse der DEA-Ergebnisse zu testen; Spearmans Rangkorrelationskoeffizient um die Verbindung der DEA-Effizienz-Ergebnisse mit den traditionellen Bilanzkennzahlen zu untersuchen; und schließlich die Effizienz-Rentabilitätsmatrix, um die Performance von Banken sowie die Faktoren, welche die Effizienz beeinflussen, zu charakterisieren. Die Analyse wurde hauptsächlich über den Zeitraum von 2005 bis 2008 durchgeführt. Hierdurch können die Auswirkungen der jüngsten Finanzkrise auf die Effizienz und Produktivität der ausgewählten Banken bestimmt werden.

Die einleitenden Untersuchungen der auf Marktumfragen basierenden Analyse zeigen, dass das islamische Finanzwesen einer der am schnellsten wachsenden Sektoren der Finanzbranche ist. Die islamischen Finanzprodukte und Dienstleistungen werden zunehmend als eine rentable Investitionsmöglichkeit angesehen, was sie sehr attraktiv für Muslime und Nichtmuslime gleichermaßen macht. Führende islamische Banken aus muslimischen Ländern erweitern ihr Netzwerk. Mehrere europäische Banken sind direkt an der Bereitstellung islamischer Finanzprodukte beteiligt, um die speziellen Bedürfnisse der muslimischen Kunden zu befriedigen sowie die von nicht-Muslimen, die ethische Finanz- und Anlagelösungen suchen. Schließlich haben auch die europäischen Regierungen damit begonnen, ihre rechtlichen, steuerlichen und regulatorischen Systeme zu ändern, um die Einrichtung von islamischen Banken zu ermöglichen.

Am wichtigsten, aus empirischen Gesichtspunkten, ist das vorgestellte Ergebnis, dass islamische Geschäftsbanken in Europa technisch relativ ineffizient sind. Sie haben außerdem, im Durchschnitt, schlechte finanzielle Leistungen und leistungsschwache Aktivitäten. Des Weiteren

leiden islamische Banken in Europa über die betrachteten Jahre an einem signifikanten Produktivitätsverlust, der zu einem großen Teil von einem Rückschritt bei den technischen Innovationen der Banken getrieben wird. Im Großen und Ganzen beruht die Ineffizienz der Banken auf einer suboptimalen Geschäftsgröße sowie einem Mangel an Managementwissen und –fertigkeiten. Die Ergebnisse weisen darauf hin, dass die optimale Größe islamischer Banken, um bessere Leistungsniveaus zu erzielen, weder zu groß noch zu klein ist. Deshalb führt eine Erhöhung der Bankengröße durch Fusionen und Akquisitionen zu einem wesentlichen Anstieg der technischen Effizienz sowie des Produktivitätsfortschrittes.

Die Zeit vor der heutigen Finanzkrise war durch das stabilste wirtschaftliche Umfeld seit Generationen gekennzeichnet. Die Ergebnisse zeigen auf, dass die islamischen Banken, vor Ausbruch der Krise, im Hinblick auf die geschätzten Effizienz-Ergebnisse und Produktivitätsveränderungen relativ zu ihren konventionellen Peers zurückgeblieben sind. Auffallend ist, dass die konventionellen Banken in den Folgejahren allmählich ihre Überlegenheit gegenüber islamischen Banken verlieren, im Durchschnitt jedoch vor islamischen Banken bleiben. Die islamischen Banken sind, im Vergleich mit konventionellen Banken, in der Tat weniger anfällig für die Auswirkungen der Krise. Diese weisen während dieser schweren Krise nur geringe Ineffizienzen und Produktivitätsrückgange auf und erbringen daher einen konstanten und bemerkenswert positiven Trend hinsichtlich technischer Effizienz, Produktivitätsentwicklung und finanzieller Rentabilität. Dies könnte der Fall sein, da der Glaube an die Macht des Petrodollar der Golfregion sehr hoch ist, sowie die Tatsache, dass die islamischen Banken derzeit relativ klein und jung sind. Ein weiterer Grund könnten die religiös begründeten finanziellen Zwänge sein. Solche Faktoren könnten eine wichtige Rolle dabei gespielt haben, dass islamische Banken kaum von der Krise getroffen wurden. Im Großen und Ganzen weisen die Ergebnisse darauf hin, dass die kleinen und neuen islamischen Banken in Europa genauso effizient und produktiv wie große und alte islamische sowie konventionelle Banken sein können. Sie weisen außerdem langfristige Nachhaltigkeit, erheblichen Spielraum für Verbesserungen sowie ein großes Potenzial in der Finanzindustrie auf, ihre Wettbewerbsfähigkeit nicht nur in muslimischen Ländern, sondern auch im europäischen Finanzsystem aufrechtzuerhalten.

Die geschätzten Ergebnisse bezüglich der Leistung islamischer Investmentbanken in Europa weisen darauf hin, dass diese Banken über geringe (Kosten)-X-Effizienz und eine schlechte allok-

ative Effizienz im Vergleich zu konventionellen Banken verfügen. Die Ineffizienz der Banken wird weitgehend durch die Unterauslastung der Inputs verursacht, durch die Größennachteile der Bank und, wie es scheint, auch aufgrund der vom Management nicht kontrollierten Regulierungsvorschriften, die angesichts von Fluktuationen und der Instabilität von Faktorpreisen existieren. Die islamischen Investmentbanken offenbaren zusätzlich einen deutlichen Widerspruch zwischen ihren hohen Effizienz-Ergebnissen und ihren niedrigen Rentabilitätskennzahlen. Sie sind außerdem weniger riskant, zahlungsfähiger und arbeiten mit geringerem Einsatz von Fremdkapital. Dennoch erleiden islamische Investmentbanken eine allmähliche Verschlechterung ihrer Liquiditätssituation. Das Bankenangebot der Murabaha-Finanzierung (Kostenaufschlag-Darlehen) scheint sehr beherrschend zu sein und hat deutlich an Bedeutung gewonnen.

Insgesamt scheinen die Ergebnisse zu zeigen, dass Banken, die technisch effizienter sind, zum einen größer sind (Gesamtvermögen), profitabler sind, eine höhere Kreditintensität aufweisen, über eine geringere Fremdkapitalaufnahme verfügen, mehr in zweckmäßige Mitarbeiterfähigkeiten investieren, einen niedrigeren Marktanteil besitzen (Gesamteinlagen), sowie in Ländern mit höherem Pro-Kopf-Einkommen tätig sind. Diese Ergebnisse reflektieren die starke Verbindung zwischen den DEA-Effizienz Maßen und den üblichen Maßen des Rechnungswesens. Dies weist darauf hin, dass der DEA-Ansatz getrennt oder auch zusammen mit Finanzkennzahlen übernommen werden kann, um die Vergleiche der Performance islamischer Banken robuster zu machen.

GENERAL INTRODUCTION

Banking is considered one of the main components of the financial systems. It has a broad impact on the entire financial market stability and the real strength of the economy. Banking system connects the fundamental economic units and plays the role of financial intermediation. It helps in the creation of wealth through the establishment of a series of interconnected economic relations. Consequently, any disturbance in the conventional banking sector has significant implications for the overall economic, primarily due to the banks' heavy reliance on interest rates which are either market forced or state governed.

While conventional banking uses the interest rate mechanisms to perform its operational tasks, Islamic banking, by contrast, neither charges nor pays interest but rather relies on the principle of profit-and-loss sharing. Based on this concept, Islamic transactions are similar to equity-based transactions in rewarding performance. Specifically, Islamic law requirements ensure that more emphasis is placed on reward for effort rather than reward for merely owning capital. However, given the special features and characteristics of Islamic finance, modern Islamic banking has developed techniques that replace interest income with cash flows from productive sources. It particularly attempts to find more socially acceptable and attainable substitute to the interest-bearing modes of financing in the desire to provide justified distribution of wealth and income.

Because of its moral values, Islamic finance has gradually gaining universal acceptance and attracted funds from Muslims and non-Muslims alike. The clientele for Islamic banking is not confined to just Muslim countries. It, by contrast, spread all over the world. In Europe, it is unusual to make the financial system subject to religious prescriptions. Despite of that and given its increasing popularity and high market growth rates, Islamic finance is attracting European market players and investors seeking to tap into new ethical and truly unique green investment opportunities. The UK is considered the western leader in offering Islamic financial products to target the local Muslim minorities and also to attract non-Muslims who are looking for ethical values in their financial dealings. Currently, Islamic banking is thriving and growing fast in many other western nations which are aiming to become Islamic finance centers.

Facing the severe financial crisis experienced in 2007, fostered by the highly-leveraged financial markets, the banks’ clients call for more credibility and safe financial doctrine that promise justice

and moral behaviors. These values are, indeed, inherent in the Islamic banking system and thus, it is reasonable to encourage European financial institutions to offer financial products that are in compliance with the Islamic law. The global economic crisis, therefore, presents a unique opportunity for Islamic banking to show it is viable alternative to conventional finance in Europe, as it has the capacity and capability to bring stability to the market.

In spite of the considerable spread of Islamic banking sector, there are still very limited empirical studies focusing on the efficiency and productivity performance of Islamic financial institutions. Most previous attempts focused primarily on the conceptual issues underlying interest-free financing and also concentrated in Muslim-majority countries. Similarly, the empirical studies that have been carried out to measure the performance of Islamic banks in Europe are very rare. This is due to the short presence of Islamic banking in this continent and consequently the lack of sufficient data. It remains, however, questionable whether Islamic banking has a long run sustainability and bear promising potential for more success in Europe, where conventional and Islamic banking coexist alongside each other. Therefore, in order to examine the development likelihood of Islamic banking outside its traditional borders of Muslim economies, this thesis offers the first comprehensive empirical analysis of the efficiency and productivity performance of the European Islamic banks against conventional banks operating in Europe, and also against Islamic banks from Muslim countries. Our analysis covers primarily the period of 2005-2008. This time span helps to account for the impact of the world economic crisis emerged in 2007 on the performance of the selected banks.

The thesis is primarily structured in seven-major chapters (Exhibit 1). Chapter 1 presents and discusses the main concepts, features, and teachings of Islamic finance and banking. The chapter also attempts to give the reader some relevant information about Islamic finance modes of operation in addition to the common Islamic financial products in the areas of banking, Takaful and the Islamic capital market. Eventually, the chapter provides an overview of the special risks and challenges associated with Islamic finance.

Despite the general lack of the valuable Islamic financial data in the world at large, Chapter 2 provides an in-depth market analysis for Islamic banking and finance, and explores the evolution dynamics in this novel concept. It takes rather a narrow view to focus more on the emergence and

rapid growth of Islamic finance within and outside the interest-based financial systems. Chapter 3, on the other hand, points out the various factors that have contributed to the most recent crisis. It further looks at the nature and extent of the impact of the crisis on the global conventional financial market. The effects of the crisis in the consistency, sustainability, and solidity of Islamic banks are also shortly outlined in this chapter.

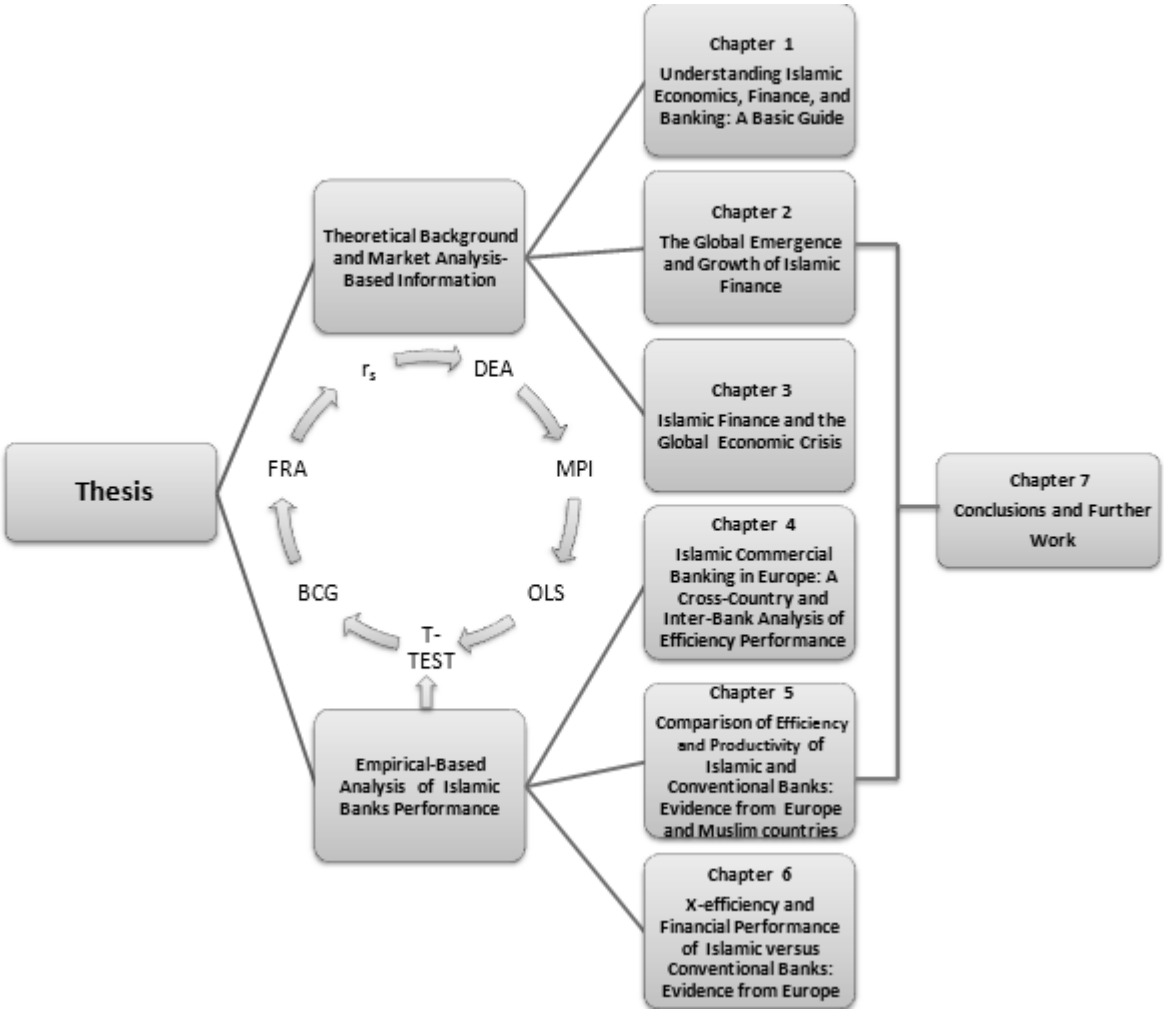


Exhibit 1: Full-width Framework of the thesis

The religious aspects of Islamic finance are important, but can distort the intention of this thesis. Consequently, this thesis will show, from a non-religious perspective, how the West should view Islamic finance without bringing in faith based commentary. To this end, from an empirical point of view, we utilize different empirical approaches in chapter 4, 5, and 6, respectively, in order to estimate the overall performance of Islamic banks in Europe. More specifically, Chapter 4 utilizes a two-stage DEA model covering the period from 2005 to 2008. In the first stage of our analysis, we examine the relative efficiency performance of the Islamic B-

ank of Britain (IBB), the first stand-alone full-fledged Islamic commercial bank in the West, against small and large conventional banks in the UK and also against small and large Islamic banks from Turkey, Gulf Cooperation Council (GCC)-States, and Malaysia. In the second stage, we regress efficiency scores on a set of explanatory variables to determine their potential influence on the bias-corrected efficiency scores. To further complement the results of the efficiency measures, the consistency of the DEA based efficiency scores were checked by examining their statistical relationship (i.e. the Spearman's rho correlation coefficients) with traditional non-frontier (financial) based performance indicators. We finally use the efficiency-profitability matrix based on the efficiency scores and the bank's profitability ratios in order to enable the characterization of the banks' performance profile.

Additionally, in Chapter 5, we employ the DEA methodology to generate efficiency scores in order to empirically examine and evaluate the differences in performance of Bosna Bank International (BBI) in Bosnia and Herzegovina and IBB in the UK. The comparative analysis of both banks is carried out relative to small conventional banks in both countries on the one hand, and also relative to small and large Islamic commercial banks from GCC-States, Malaysia, Turkey, and Azerbaijan, on the other hand. We then applied the DEA-based Malmquist index approach in order to calculate Islamic bank's indices of changes in Total Factor Productivity (TFP), technology, and technical and scale efficiency. Moreover, to test the association of efficiency estimates with variables that are not inputs or outputs, we perform a two-stage DEA method. To this end, after solving for DEA in the first-stage, the efficiency scores are then regressed upon the environmental variables which could potentially influence the efficiency of a bank.

In chapter 6, we try to assess the financial performance of the first-established Islamic investment, wholesale, and private banks operating in Europe. We divided the chapter into two main parts. In the first part, we use the DEA-approach to assess the (cost) X-efficiency of Islamic banks operating in the UK and Switzerland relative to conventional banks. In the second part, we primarily use the most common accounting ratios to examine the financial performance of the first European Islamic investment bank in the UK. Furthermore, to determine the differences of the bank's performance in pre- and post- the economic crisis of 2007, we employ the inter-temporal analysis of data using "t-test for equality of means". Eventually, conclusions, overall remarks, and the future extension of our work are presented in chapter 7.

Chapter 1

Understanding Islamic Economics, Finance and Banking: A Basic Guide

1.1. Background

Islam is not merely a religion, but it is also a comprehensive socio-economic and political system for the Islamic society, where it is necessary to apply the ethical principles of the Holy Quran and the '*Sunnah'* (Prophet Muhammad's statements and actions). Islamic economics refers to a system which identifies and promotes economic and financial orders that are consistent with the principles of Islamic law, *the Shari'ah*. Set of principles substantially differentiate Islamic economics from the conventional economics, as it goes beyond the pure economic and financial issues. Specifically, Islamic law prohibits the collection and payment of interest. Muslims earnings must come from permissible means, and must also be spent on Islamically acceptable categories of expenditure. Consequently, Islam prohibits investing in businesses that are considered unlawful or contrary to the Islamic teachings and values. Moreover, the distribution of wealth is considered to be the primary concern in Islamic economics. Wealth in Islam should be shared, not become concentrated in few hands (rich people). For Muslims, concern for others, particularly the poor and the needy, is deeply inscribed in the pillars of Islam. Islam, therefore, encourages Muslims to maximize their wealth as long as they do not create a situation that is socially disruptive or violate the norms of Islamic justice (Dusuki, 2006).

In discussing Islamic economics, we take a rather narrow view and focus, to some extent, on Islamic banking and finance. Islamic finance is as old as the religion itself. It's practices have been really used throughout the last 1500 odd years across the Muslim world. Islamic finance has, however, moved from a mere old theoretical concept to a practical reality. A natural consequence of this progress is the opening up of new avenues for its advancement. Islamic finance is, indeed, a growing sector with its diversity in different segments in various parts of the world. Islamic finance has not taken root solely in Muslim-majority countries but has also spread to

non-Muslim countries. It specifically caters to religious Muslims in Muslim's societies, as well as in countries where Muslims are in minority.

Muslims need financing services as much as anyone in order to finance their business ventures, to facilitate capital investment, and/or to undertake trading activities, etc. Muslims attempt to restructure their financial lives on the basis of Islamic law, and consequently to find out the means to fulfill their financial requirements in view of prohibition of interest in a world where the entire financial system is based on interest-usury. Their intent is to create a just, ethical and socially inclusive financial and business system across the broad spectrum of society. It is, therefore, the biggest challenge and the formidable task for them to reform their financial institutions, products and services, instruments and contracts on an interest-free basis in order to bring them in harmony with the dictates of Islamic law and within the constraints of Islamic regulations.

This chapter aims at showing the contours and characteristics of the Islamic economic system. It is mainly theoretical rather than empirical. It specifically attempts to give the reader a better understanding of the fundamental principles and features of Islam that underpin Islamic economics and finance. This chapter discusses also the Islamic financial contracts (modes of operation) in addition to the most used Islamic financial products in the areas of banking, insurance and capital market. It eventually highlights the most significant challenges and risks particularly associate with Islamic finance.

1.2. Basic principles, features and characteristics of Islamic economics and finance

Shari'ah principles are widely utilized in Islamic finance. As Islamic financial institutions seek to structure more innovative products for customers, it is, therefore, important to understand the principles of Islamic finance and the specific features of each principle (Exhibit. 1.1). Conventional investors also need to understand these standards in order to be able to provide the services demanded by consumers who want to comply with Islamic guidelines, as well as to know the potential implications of the interaction between Islamic and conventional financial institutions.

1.2.1. Prohibition of the interest (Riba): Rationality and economic wisdom

According to Shari'ah, "riba technically refers to the premium that must be paid by the borrower to the lender along with the principle amount as a condition for taking the loan" (Chapra, 1984).

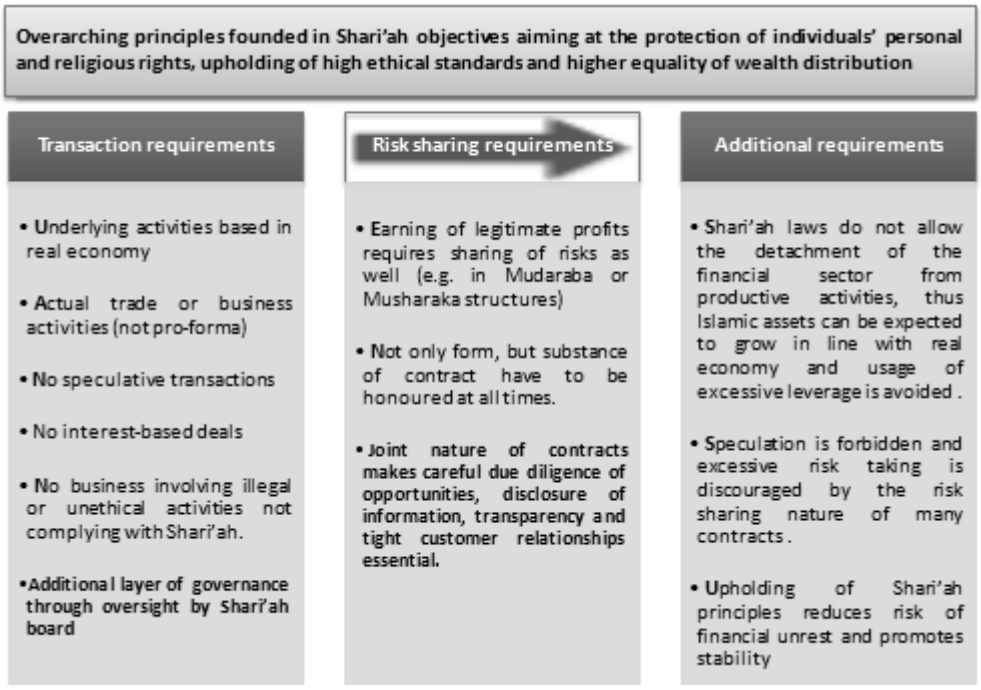


Exhibit 1.1: Overarching principles of the interest prohibition-driven finance
Source: Booz & Company, (2011)

Some later Muslim scholars define riba as the explicit increase imposed on the debtor at the maturity of the debt in case he/she fails to repay the principal amount plus any interest and wants to roll it over (Siddiqi, 2004). By and large, the consensus (Ijma') among Muslim scholars and jurisprudents is that riba is generally seen as unjustified earning, where a person could receive a monetary advantage without giving an equitable (a just) counter-value (Chapra, 1986).

The prohibition of riba clearly means that money can be, in practice, lent lawfully merely for either charitable purposes or for doing lawful business on the basis of profit-and-loss sharing (PLS) (Khan, 2008). Islam, however, made a clear distinction between trade and riba (Chapra, 1986). The business risk is allocated evenly among all the parties involved in a trading, whereas in riba, it often lies heavily and directly on the borrower. "In its widest general implication, riba signifies any increase of capital not justified by a risk taken" (Iqbal, 2009).

The Muslim jurists have generally classified interest "Riba" into two broad types, namely: **I)** *"Riba al-Fadl*", which is described as the "unlawful" excess in the exchange of two "counter-values" (i.e., inequality of quantity or weight and dissimilarity of quality) (Chapra, 1984; Shahid, 2007). In order to be lawful, the exchange of identical commodities must occur immediately (on spot) and there must be no disparity in amount. **II)** "*Riba al-nasi'ah* ", which is related to the artificial extension of the repayment period of a loan for additional payment of money. This im-

plies that fixing beforehand a positive return (interest) on a loan, as a reward for waiting, is not allowed in Islam (Chapra, 1984). "In this sense, riba has the same meaning as interest. It makes no difference whether the loan is for consumption, or business purposes, or whether the return is a fixed or a variable percentage of the principal. It also makes no difference whether an absolute amount to be paid in advance or on maturity, or received in the form of a gift or a service if stipulated as a condition in the loan contract or an extension in its maturity" (Jarhi and Iqbal, 2001).

1.2.1.1. Profit-rate in Islamic banking: The use of interest rate as a benchmark.

It is not prohibited to make profit in Islam, as Islam encourages people to use money in "*Halal*" (Islamically permissible) investments. Making a profit, as against to interest, is based on taking risks either on the assets, which are sold by seller, or on the capital invested by an investor to earn profit (AMIS, 2005). The current concern in Islamic financial industry is the *acceptability* of the profit rate used by Islamic banks as an alternative to the interest rate. Table 1.1 summarizes briefly the main difference between "riba" and "profit" from an Islamic point of view.

Table 1.1

The difference between (*Riba*) and (*Profit*) from an Islamic perspective*

RIBA	PROFIT
Riba is pre-fixed (guaranteed in advance) and thus, always positive. It is always tied to the time period and the amount of the loan. Riba, however, can at best be very low or zero.	**P**rofit is post-determined, and thus its amount is not known until the activity is done. Profit, however, can be zero, positive, or possibly negative.
By definition, Riba is an increment in a loan or debt "paying money for the use (rent) of money", whether this applies to consumption loans or production loans.	**P**rofit, by definition, is the recognized reward for capital when capital employed only in permissible productive business. It represents the effort and the risks undertaken by the supplier of capital in an enterprise.
Riba means effortless profit or "surplus value without counterpart", and thus, lending on interest does not add value. It transfers only the use of funds temporarily from one person to another.	**P**rofit can only be claimed in the instance where either risk of loss has been assumed or effort has been expended.

* *Based on Iqbal and Mirakhor, (2007), and other sources.*

In practice, despite that the Muslim jurists on the Islamic institutions continue to proclaim all forms of interest as riba, which is subject to the most severe Qur'anic prohibition, the bulk of Islamic financial operations formally base their rates of return or costs of capital on a benchmark interest rate such as the London Inter-bank Offer Rate (LIBOR) (El-Gamal, 2003). However, benchmarking against LIBOR is permitted in Islam primarily because of the

absence of an internationally accepted Islamic profit benchmark, and also due to the apprehension in the bank's customers' mind that they may end up paying higher mark-up if it is fixed as compared to the fluctuating benchmark-based interest rate charged by traditional banks. As there are relatively few Islamic banks as compared to the large number of conventional banks, it becomes more important for Islamic banks to remain comparative and, as such, adjust their "profit" earnings close to the market. In light of the actual practices of Islamic financial providers, using LIBOR as a benchmark is only acceptable if it used particularly for determining the amount of periodic mark-up (Kettell, 2011).

From another point of view, the argument that Islamic banks must calculate their mark-up based on interest refers to a situation where the profits of all projects offered to the bank for financing are "known with certainty in advance". Therefore, it remains hard to distinct between interest and profit. Specifically, the banks receive deposits from depositors who do not want to deal in interest and keep their money in a separate account to invest them in an Islamic way and share the resulting profit with them. Thus, the profits earned are likely to be almost the same as interest. Even though if profit sharing basis rather than the mark up basis is used, the banks have no alternative but to determine a profit that would assure that the banks profit is almost the same as the interest on the interest-based operations. This is because it is almost impossible to calculate the actual profit earned on the interest-free deposits. It is also impossible to determine the amount of cost has been incurred on the deployment of deposits (Khan, 1984; Zarqa, 1981).

Khan (1984) further argued that the need of Islamic banks arises "only" when the profits are really uncertain. Thus, Islamic banks attract, in contrast to conventional banks, only the (more) risky projects. Islamic bank's revenues from profit-and-loss sharing financing would not, in his opinion, exceed the revenues of average conventional banks out of their interest loan business. However, Islamic banks will accept earning on a marginal project a rate of return on their funds which equal at least to the expected rate of return in the overall economy. The rate of return on investment in the economy should be higher than the interest rate by definition because it consists of both the premium of risk and the cost of capital. The return on all the projects therefore will be higher than the interest charged by conventional banks. This factor is, indeed, considered to be the most important factor leading customers to refrain from taking funds from Islamic banks.

1.2.1.2. Zero interest-rates : An economic point of view

A zero nominal interest rate occurs when the interest rates match the inflation rates. Some economists argue that a zero interest rate is a necessary condition for optimal allocation of resources (Friedman, 1969); while others show that it is not only necessary but also sufficient condition (Cole & Kocherlakota 1998). According to Al-jarhi, this is because "after switching from metallic to fiat money, adding one marginal unit of real balances costs no real resources to the community. Thus, imposing a positive price on the use of money would lead traders to economies on the use of money, in their pursuit to minimize their transactions costs. They would then use some real resources instead of money". However, when the rate of interest equal zero, traders will have no incentive to substitute real resources for money. Thus, more real resources can be addressed to consumption and investment, which benefits the society as a whole (Wilson, 1979; Al-Jarhi and Iqbal, 2001).

Taking into account the economic cycle, during recession time, central banks tend to lower nominal interest rates. If they cut interest rates very fast, they then can start to approach the level of inflation. Inflation often rises when interest rates are cut too quickly, since these cuts have a simulative effect on the economy. Additionally, in order to reach an optimal allocation of resources, economists would be expected to search for the set of monetary policies that could bring the rate of interest to zero. Thus, it appears that deflating the economy at a rate equal to the real rate of interest would set the rate of interest to zero. This would be the optimal monetary policy that insures that financial resources are allocated efficiently (Al-Jarhi, 2009).

At the country level, the only ways to control the deficit, according to most governments, are to raise taxes or to cut government spending. Considering that the deficit continues to grow simply because of the exorbitant amounts of compound interest added to the original debt, one of the most effective ways to reduce the deficit would be to reduce interest rates. As a matter of fact, at zero-interest, the debt would not grow and the large amounts of money spent in servicing the debt could be used to pay it off **(**Bleher, 2008).

By and large, there is still ongoing debate among economists regarding the notion of zero-interest rat. While there are many economists who support zero-level of interest rates, others are worry about the existence of a liquidity trap when the rate of interest is zero (Uhlig, 2000). They may also worry that when the rate of interest becomes very low, monetary authorities have less leeway with adjusting it downwards in the face of recession.

1.2.2. Commitment on paying Al-Zakah: "The social duty to benefit society"

Zakah is the religious tax to be deducted from wealth and to be paid to the poor people. Zakah means purification and growth, and is considered as a major mechanism for the allocation of resources and the redistribution of income and wealth. This tax is a compulsory levy, one of the five basic tenets of Islam. Zakah is payable on genuinely owned, productive and surplus assets that have been possessed for a full year. This means that casual acquisitions and perishable goods are not subject to Zakah (Clarke, Craig, and Hamid, 1996). More specifically, genuine ownership means that the asset is free of claims by others. Productive assets are regarded to cash in hand and/or at bank, stocks, shares, bonds, inventories of finished goods intended for sale, earnings from rented fixed industrial assets and net receivables. Assets which are being used or consumed are exempt from paying Zakah.

Islamic regulations outline that the generally accepted amount of the Zakah is 2.5% of Muslim's annual wealth in cash or kind from all forms of assessed wealth reached or exceeding "*nisab*", the minimum amount one have to possess. This indicates that if the sum of the property owned by Muslims is below the *"nisab"* at the time Zakah falls due, Muslims do not have to pay.

1.2.3. Prohibition of uncertainty or speculation (Gharar and Maysir)

Gharar is defined as the uncertainty, hazard and game of chance (gambling) (AL-saati, 2003). It technically refers to the sale of probable items whose existence or characteristics are not certain, or a sale involving *excessive* risk or moral hazard (Ayub, 2007). This, to some extent, makes this way of trade similar to gambling. The reason of prohibition is that speculators generate their private gains at the expense of society at large (Elmelki and Ben Arab, 2009). Gharar does not create additional wealth. "It only transfers wealth from its (losing) owners to new (winning) ones" (Siddiqi, 2009). Transactions containing risk are supposed to enhance uncertainty and deceptive behaviors. However, in practice, as it is involved in every economic activity, minor uncertainties and certain degree of risk are Islamically permitted (Siddiqi, 2008).

"The unjustified enrichment through games of pure chance" in order to amplify wealth without making effort is called *Maysir* (Algaoud and Lewis, 2007). Maysir is involved in contracts where the ownership of a good depends on the occurrence of a predetermined but uncertain event in the future (Gassner and Wackerbeck 2007). This means that if the business contract is signed, there

will be a gain for one party and a loss for the other party, but it is not sure beforehand who will be the winner or the looser.

Overall, the ban of Gharar and Maysir has particular relevance for financial markets, notably the derivatives market (for more information on derivatives, see Table 1.4-part (C) in the appendix) and the insurance business (Algaoud, and Lewis, 2007). Therefore, the trade of all conventional derivates instruments is unacceptable in Islamic finance.

1.2.4. Islam discourages heavy debt and support a policy of bad debt cancellation

Islam discourages accruing heavy debt, except in cases of real necessity, because it can lead to harmful consequences. Islam permits and encourages assuming debt within reasonable limits. If debts are incurred, a full repayment is then important. If the borrower defaults on his/her payments, then Islam encourages lenders to either wait until such time as the existing loan can be repaid or to re-schedule the loan repayments but with no penalties (Hassan and Kayed, 2009).

1.2.5. Prohibition of financing certain economic sectors (or companies)

Investment is forbidden in socially and ethically detrimental activities. These include, for example, gambling, pornography, alcohol...etc. It is also not permissible to acquire the shares of the companies providing financial services on interest like conventional banks and insurance companies whose business are not acceptable by Islam.

Islam encourages Muslims to avoid investing in companies for which Total Debt divided by Trailing 12-Month Average Market Capitalization is $\geq$ 33%. Muslims also should exclude the following companies from their investment portfolios: **I**) Companies for which the sum of Cash and Interest Bearing Securities divided by Trailing 12-Month Average Market Capitalization is $\geq$ 33%. **II**) Companies for which Accounts Receivables divided by Total Assets is greater than or equal to 45% where the Accounts Receivables = Current Receivables + Long-Term Receivables. **III**) Companies for which non-operating interest income divided by revenue is $\geq$ 5% (DJI, 2005). However, "if a company has non-operating interest income but the net income is negative, it is then excluded. A company with negative net income while there is no non-operating interest income may still be included" (Obaidullah, 2009).

1.2.6. Profit-Loss Sharing (PLS): No pain, no gain principle

There is a substantial difference between profits resulting from entrepreneurial activities and profits generated by granting loans. The latter is defined as receiving a monetary advantage without giving a counter value, and is, therefore, forbidden on ethical grounds. Islam is not opposed to profit or financial gain, as long as: an effort is performed, (partial) liability is accepted for the financial result of a venture, the venture is productive (led to an increase of value), and the profit is made in line with the Shari'ah (Schacht, 1964).

The Islamic solution, commonly referred to as Profit-Loss Sharing (PLS), suggests an equitable sharing of risks and profits between the parties involved in a financial transaction. Under PLS, "the lender and the borrower assume the investment's risk based on a pre-agreed formula". PLS acquires several forms depending upon the type of contract e.g. Mudaraba (Joint venture) and Musharaka (partnership and collaboration). In both of these forms, the financier makes the funds available, not as a lender, but rather as an investor (Benjelloun, 2010). The financier shares the profit (loss) and is not assured, in advance, of a positive rate of return. Losses must be shared by the financier in proportion to his share in the total financing while profits may be shared in any mutually agreed ratio. However, the financier liability remains limited to the extent of financing provided by him and no more (Luca and Vasudevan, 2002).

1.2.7. Tangible Asset-backing principle (TAB)

Money in Islam is not considered an asset class and, thus, may not necessarily earn a positive return (NBR, 2008). Money, therefore, should always be tied to and underpinned by an identifiable and tangible underlying asset. This suggests that all financial transactions should "collateralized by a reference portfolio of on-balance-sheet assets of the originator" (Zainal, 2009).

1.2.8. Money as a "Potential" capital : Characteristics of money and commodities

Based on Islamic economic principles, money is considered as "potential" capital. That is, it becomes actual capital only when it is invested in a productive activity. Islam recognizes the time value of money, but only when it acts as capital, not when it is "potential" capital (Iqbal, 1997). Taking into consideration that the modern finance are based on the concept of money's time value, Islamic finance does not revoke the time's monetary valuation. "Shari'ah does not

prohibit increment in loan in the price of a commodity in any sale contract to be paid at a future date. It does prohibit making money's time value an element of a lending relationship where it is claimed as a predetermined value (Khan, 1991). In this case, Shari'ah requires that a loan be paid back in the same currency by which it was given" (Ahmad and Hassan, 2007).

"According to the capitalist theory, there is no difference between money and commodity in so far as commercial transactions are concerned. Both are treated at par and can be sold at whatever price parties agree upon. For them selling 100 $ for 110$ is the same as selling a bag of rice costing 100$ for 110$" (AIMS, 2010). Money and commodity, however, have different characteristics under the Islamic law, as compared with the capitalist theory. Islam, for example, does not recognize money as a commodity, such that there should be a price for its use. Money is used for buying and/or selling of other goods not buying and/or selling of money per se. The later action could make money not perform its original function of measure of value, store of value and medium of exchange in asset-oriented economy, primarily because such transaction will become the person's main goal (Ghazanfar & Islahi, 1990).

In other words, "while money is recognized in Islam as a means of exchange, it may not lawfully be regarded as a commodity for exchange" (Iqbal, 2009). Money has no intrinsic value in itself but is only a measure of value and/or a medium of exchange therefore, should not used to generate more money. "Money, by itself, is not capable of fulfilling human needs unless converted into a commodity. A commodity can, on the other hand, fulfill human needs directly, and can be of different quality while money has no differential quality in the sense that a new note is exactly equal in value and quality to an old note. Also, commodities are transacted (or sold) by pinpointing the commodity in question or at least by giving certain specifications. Money cannot be pinpointed in a transaction of exchange. Even if it is, it would be of no use since the different denominations of money summing into equal amount are exactly the same" (AIMS, 2010).

1.3. Islamic financing contracts (modes of operations)

There are many contracts and institutional forms used within the Islamic finance industry. Financing tools that have been widely exercised by Islamic banks are primarily based on two general principles: the PLS principle and the mark-up (MUP) principle. The first principle states that the bank (financer) is allowed to profit from a given loan under the condition that the bank is willing to share the investment risk. Contracts that are based on this principle (e.g. Mudaraba and

Musharaka financing) can possibly be seen as equity investments. Under the MUP principle, the bank may purchase a good/service or lease an asset in barter for a margin. Contracts that are based on this principle include debt-based financing modes such as: Murabaha, Salam, Istisnaa and Leasing (i.e, pure Ijarah and Ijarah & Iqtina) and referred to as "fixed return financing based on the "mark-up" or "cost-plus" concept. For more information and details regarding the most common Islamic financing contracts see Table 1.2 and Fig. 1.6-1.11 (appendix).

Specifically, the permissibility of risky capital investment without explicit interest earning generates 3 forms of Islamic financing for both investment and trade (Hesse, Jobst and Solé, 2008): **I**) synthetic loans (debt-based) through a sale-repurchase agreement or back-to-back sale of borrower or third party-held assets. **II**) Lease contracts (asset-based) through a sale-leaseback agreement (operating lease) or the lease of third-party acquired assets with purchase obligation components (financing lease). **III**) Profit-sharing contracts (equity-based) of future assets. As opposed to equity-based contracts, both debt- and asset-based contracts are initiated by a temporary (permanent) transfer of existing (future) assets from the borrower to the lender, or the acquisition of third-party assets by the lender on behalf of the borrower (Jobst, 2005).

In reality, Islamic finance industry relies on debt-based structures instead of equity-based ones. This might be due to the fact that the capital adequacy requirements for equity-based products, in order to maintain high capital ratios and prevent dilution of banks ownership rights, are higher than debt-based ones. Also, the taxation treatment of debt makes it more attractive than equity. However, if Islamic banks use equity-based structures, their operations will be riskier. Specifically, while the larger payouts to depositors in the short term may increase deposits and thus, could provide some comfort in the present economic scenario, the rate of return to depositors at Islamic banks will be low in the long term which could, in turn, encourage deposit withdrawals leading to a potential liquidity and solvency problems, particularly due to the compliance with regulatory and taxation rules (Brownlow and Shafique, 2009; Abedifar, et al., 2012).

1.4. Islamic financial services

The most well established forms of Islamic finance are: banking and Sukuk (Islamic bonds). Takaful (the Islamic insurance) and funds are also evolving. Islamic private equity and Islamic private wealth management still need an innovation (Fig. 1.1).

Table 1.2

A Brief Definition of the Main Islamic Modes of Financing

Mudaraba (Passive Partnership-PLS):

It is a special kind of partnership (two tiered transaction for an Islamic bank) where one partner gives money (the capital owner-financer) to another (the investment manager-mudarib) for investing it in an enterprise. The Profit is distributed between the two parties in accordance with the ratio that they agree upon at the time of the contract. Financial loss is borne by the capital owner. The manager will loss the "opportunity cost" of his own labour, which failed to generate any positive income.

Murabaha *

Murabaha is considered a sale contract between the Islamic bank and his client. The client orders the bank to purchase for him a certain commodity from a third party at a specific price, promising to purchase this commodity, from the bank, once it has been bought, but at deferred price. The deferred price includes an agreed upon profit margin "markup" in the favor of the bank as a return for its services.

Ijarah (Leasing) *

The term 'Ijarah' is used particulalry in two different situations. On the one hand, it means to employ the services of a person on wages given to him as a reward for his hired services. On the other hand, 'Ijarah' means to transfer the usufruct of a particular property to another person in exchange for a rent claimed from him. In this case, 'Ijarah' is analogous to the term 'leasing', as used in modern business terminology. Here the lessor is called 'Mu'jir', the lessee is called 'musta'jir' and the rent payable to the lessor is called 'ujrah'.

Qard hasan (beneficence loans).

This is the zero return type of loan that the Islam urges Muslims to make available to those who need them. The borrower is obliged to repay only the principal amount of the loan, but is permitted to add a margin at his own choice.

Tawarruq

Tawarruq is a sale of an asset to a purchaser with deferred payment. The purchaser then sells the asset to the third party on cash with a price lesser than the deferred price, for the purpose of getting cash. However, every tawarruq transaction creates a debt. This debt is consistently larger than the cash it transfers to the client.

It is considered lawful in fiqh (jurisprudence) to charge a higher price for a good if payments are to be made at a later date (Bai' muajjal). According to fiqh, this does not amount to charging interest, because it is not considered as a lending transaction but rather a trading one. Bai' Mu'ajjal is valid; however, if the due date of payment is fixed in an unambiguous manner. The deferred price may be more than the cash price, but it must be fixed at the time of sale. Once the price is fixed, it cannot be decreased in case of earlier payment, nor can it be increased in case of default.

Salam*(or Bay' As-salam: the Islamic alternative to conventional derivatives)

Salam is a sale contract whereby the seller undertakes to supply a specific good to the buyer at a definite future date in exchange of an "advanced price fully paid at spot". The price is cash, but the supply of the purchased goods is deferred. "It is one of the basic conditions for the validity of a sale in Shari'ah that the commodity (intended to be sold) must be in the physical or constructive possession of the seller".

Musharaka (Active Partnership "joint venture"-PLS):

A contract similar to that of the Mudaraba, with the difference that in the case of Musharaka both partners participate in the management and provision of capital. They also share in the profit and loss of the investments. More specifically, profit is distributed between partners in accordance with agreed ratios, but loss must be distributed in proportion to the share of each partner in the total capital.

Diminishing Musharaka (Co-ownership) :

A contract between the bank and beneficiary. The two parties agree to enter into a partnership to own an asset, on the condition that the financier will gradually sell his share to the beneficiary at an agreed price and in accordance with an agreed schedule. As a result, the withdrawing partners share diminishes gradually along with the share of the profits, in line with their declining equity stake.

Ijarah wa iqtina': A lease ending in the purchase of the leased asset

"Ijarah wa iqtina' is simply a financing contract in which the ownership of the leased asset is to be transferred to the lessee at the end of the lease agreement. This transfer of the ownership is made through a contract, in which the leased asset is either given to the lessee as a gift or is sold to him at a nominal price at the end of the lease agreement".

Istisna*

A contract in which a party orders another to manufacture and provide a commodity. The description of, delivery date, price and payment rate are all set in the contract. Hence, it is a kind of sale where a commodity is transacted before it comes into existence. However, it is necessary for the validity of istisna' that the price is fixed with the consent of the parties and the necessary specification of the commodity is fully settled between them. "The price may be paid in installments, in step with the progress of the work, or partly at the front end and the rest at the time of delivery". However, after the manufacturer starts the work, the contract cannot be cancelled unilaterally.

Sources: AIMS, IIBI, Ayub (2007), El-Gamal (2006), Visser (2009), Al- Jarhi & Iqbal (2001), Ariff & Igbal (2011), Usmani (2000), and Siddiqi(2007).

*all are considered as a debt instruments (Ijara is Quasi-debt instrument)

1.4.1. Islamic banking

Islamic banks are banking institution whose activities include all currently known banking activities. They have the same purpose as conventional banks except that they make money by lending out capital in accordance with the rules of the Islamic law. Islamic banks have to set up Shari'ah Committees (SC) to ensure that they conduct their affairs in accordance with the Shari'ah principles. Islamic banks advance funds on a profit-loss-sharing (PLS) principle or on a de-

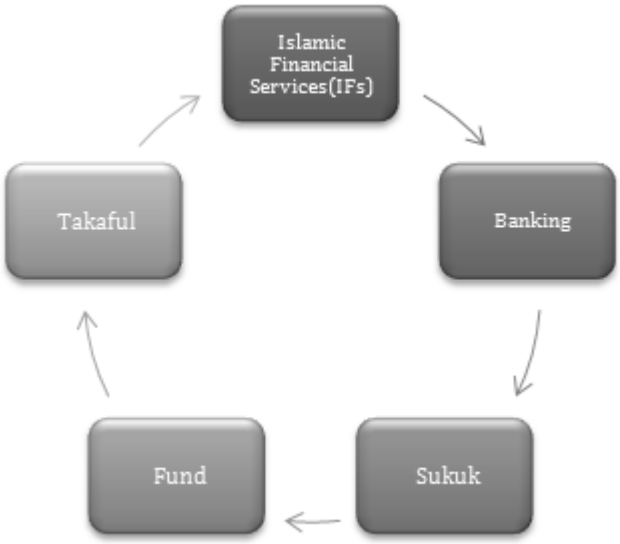


Fig. 1.1: Main Islamic financial services

bt-creating basis. They provide finance to enterprises through either sharing directly in the net results of their activities or financing their purchases of assets, goods and services (AL-jarhi, 2005). In an Islamic mortgage transaction, Sarker (1999) stated that instead of loaning the buyer with money to purchase an item, a bank might buy the item itself and re-sell it to the buyer at a profit, while allowing the buyer to pay the bank in installments. However, because the bank's profit cannot be made "explicit", there are therefore no additional penalties for late payment. Consequently, Islamic banks ask for strict collateral in order to protect themselves against default and thus, the purchased item is registered to the name of the buyer from the start of the transaction in form of Murabaha financing. Moreover, Islamic banks lend money to companies by issuing floating rate interest loans which is pegged to the company's individual rate of return. This practice is called Musharaka, where the bank's profit on the loan is equal to a certain percentage of the company's individual profits.

Additionally, Islamic banks mobilize funds on the basis of a Mudaraba or Wakalah contracts (Shahid, 2007). They can also accept demand deposits which are treated as interest-free loans

from the clients to the bank and are certainly guaranteed. In theory, Islamic banking is often synonymous with full-reserve banking, with banks achieving a 100% reserve ratio (Harcourt, 2004). This is, however, not always the case in practice (Njanike, 2009). Islamic banks further play the role of an investment manager for the owners of time deposits (usually called investment deposits: restricted or unrestricted (Fig.1.2)). They provide the owners of funds the opportunities to place their financial resources profitably, as they become implicit partners of those institutions that

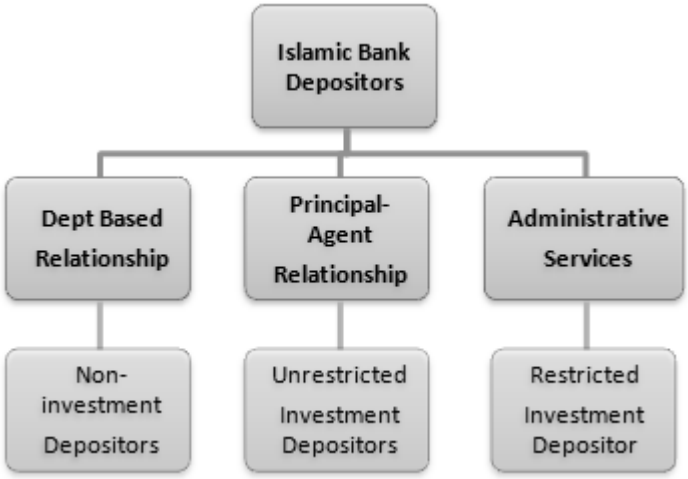


Fig. 1.2: Islamic bank depositors' groups

share in their net profit, while carrying a proportional share in their risk. In a way that depends on the size and date to maturity of each deposit, an Islamic bank shares its net earnings with its depositors who must be informed in advance of "the formula used for sharing the net earnings with the bank" (Al-Jarhi, 2004). From a comparison point of view, Islamic banking and conventional banking are extremely different in many ways. Table 1.3 illustrates the main differences between Islamic and conventional banks (systems).

1.4.2. Islamic investment funds

The term *Islamic investment fund* means a joint pool wherein the investors contribute their surplus money for the purpose of its investment to earn Islamically acceptable profits in strict conformity with the precepts of Islamic Shari'ah (Usmani, 2005). The validity of Islamic funds (i.e. Equity Fund, Ijarah Fund, Commodity Fund, Murabaha Fund and Mixed Fund) will be subject to two basic conditions: *The first* condition illustrates that instead of a fixed return tied up with their face value, as in conventional fund, Islamic fund must carry a pro-rated profit and thus, neither the principal nor a rate of profit can be guaranteed (Ayub, 2007). The subscribers enter into the f-

Table 1.3

Main distinguishing features of the Islamic banks (system) from conventional peers

Conventional Banking System	Faith-Based (Islamic) Banking System
Lending money and getting the principle back with interest is the fundamental function. The general relationship between the bank and its client is primarily that of a debtor and creditor. Conventional banks mostly act as intermediaries between lenders & borrowers enjoying almost a risk-free spread. Specifically, banks do not usually indulge in equity financing. They carry much less risk, major part of such risks being transferred to the borrowers.	**T**he status of Islamic bank in relation to its clients is that of partners, investors and trader, buyer and seller. Participation in partnership business based upon the principles of equity financing and real economic activities is the fundamental function. Greater share of potential risks forces Islamic banks to manage it more professionally to ensure better returns than conventional accounts. Depositors & investors have the opportunity to earn higher returns but also could suffer losses.
The purpose of investments is to maximize private profit & wealth without any restriction. The emphasis then is primarily on credit-worthiness of clients.	**T**he purpose of investments is to increase beneficial output to the community as whole. Thus, it gives greater emphasis on the viability of the projects. Islamic banks also aim at maximizing profit but subject to Shari'ah restrictions.
Conventional banks guarantee the capital (value of the deposits) and rate of return (interest rate).	**I**slamic banks, working on the principle of PLS, they cannot, by dentition, guarantee any fixed rate of return on deposits. Islamic banks can only guarantee deposits for deposit account, which is based on *al-wadiah* and thus, the depositors are guaranteed repayment of their funds. However, if the account is based on Mudarabah, for example, clients have to share in a loss position.
In case of debtors default, the bank can charge additional money (compound penal rate of interest). In case of banks bankrupts, depositors are paid before the shareholders. However, for commercial banks, borrowing from the money market is the main source of liquidity.	**N**o additional charge or small amount of compensation is charged but if so, these proceeds are given to charity. An investment account holder will have similar rights as shareholders. However, for the Islamic banks, it is comparatively difficult to borrow money from the money market.
Transactions are financial asset based money. Debt burden arising out of excessive use of credit leads to bankruptcies and waste of financial resources. Due to absence of goods & services behind the money while distributing funds, the expansion of money takes place, which creates inflation. Bridge financing and long term loans are not made on the basis of existence of capital goods; rather they are distributed on the basis of window dressed project feasibility of the entrepreneur.	**F**inancing is backed by real assets and meant for productive use to reduce the overall debt burden. Due to the existence of goods & services, no expansion of money takes place and thus, no inflation is created. For example, Musharkah & Diminishing Musharkah agreement are made after making sure the existence of capital good before disbursing funds for a capital project.
Money is a product besides medium of exchange and store of value. Money commonly used to make more money. Time value is the basis for charging interest on Capital.	**R**eal asset is the product. Making money from money is not Islamically acceptable. Money is just a medium of exchange. Profit on exchange of goods & services are the basis for earning profit.
Debt financing gets advantage of leverage for an enterprise due to interest expense as deductible item from taxable profits. This causes huge burden of taxes on salaried persons. Thus, the saving and disposable income of the people is affected badly. This results decrease in the real GDP.	**S**haring profits in Mudaraba and sharing in the business venture in Musharaka provides extra tax to Federal Government. This leads to minimize the tax burden over salaried persons. Due to which savings & disposable income of the people is increased, this leads to an increase in the GDP.
Trading and dealing in derivatives are widely considered as the main source of liquidity in the conventional financial, commodity and capital markets.	**T**he existence of uncertainty in a contract is prohibited. "Full disclosure" by both parties is the norm in contracts. Derivatives trading are considered as having elements of Gharar.

Source: AIMS-UK website (based on: Al-Jarhi & Iqbal (2001)), Ayub (2007), El-Gamal (2006), Al Baraka bank Lebanon website and Lafferty Group website.

und with a clear understanding that their return is tied up with the "actual" profit earned or loss suffered by the fund. *The second* condition suggests that the amounts pooled together must be invested in a business acceptable to Shari'ah. This particularly means that the channels of investment as well as the terms agreed with them must conform to the Islamic principles (Usmani, 2005). Table 1.4 (a) illustrates the main types of Islamic investment funds.

1.4.3. Islamic insurance (Takaful)

Despite of the belief in *God or Fatalism*, Muslims, like all human beings, should find suitable means to avoid the possibility of meeting catastrophes and disasters and also to minimize financial losses, as efforts to avoid risk are not against the Islamic tenets. One possible way out is to buy an Islamic insurance cover called "Takaful". "Takaful originates from the Arabic word *'Kafalah'*, which means "guaranteeing each other" or "joint guarantee" (Karim et al. 2008). In Takaful, "a group of individuals pay money into a fund, which is then used to cover payouts to members of the group when a claim is made". Takaful is considered as a risk sharing entity "mutual risk- pooling" that allows for the transparent sharing of risk by pooling individual contributions for the benefit of all subscribers (Austrade, 2010).

The main objective of Takaful is to "pay a defined loss from a defined fund" (WTC-report, 2008). Takaful has no contact with uncertainty and /or excessive Gharar. This is basically because the part of installments paid by each participant is considered to be a donation (*Tabarru'*) which is particularly directed to a special Islamic fund. When an insured accident occurs, this fund is used to provide the compensation. In addition to paying the money necessary to cover for a damage, the participant can be sure he/she will be paid the (income) from the other part of installments on the basis of PLS system, regardless of the occurrence of insurance accident. The operator is actually aware of the amount of his/her share that the terms of a contract provide. The income from Takaful depends, however, exclusively on the Islamic operations carried out by the insurance company and does not appear to be a fixed interest (AIMS, 2010).

The majority of the Shari'ah scholars believe that the conventional insurance is unlawful due to involvement of Riba, Maisir and Gharar. Ayoub (2007) indicates that the distinction between the conventional insurance and *Takaful* business is more visible with respect to investment of funds. More specifically, insurance companies invest their funds in interest (Riba)-based businesses. *Takaful* companies, by contrast, undertake only shari'ah based businesses practices and

distributed profits (*if any*) in accordance with the pre-agreed ratios in the initial agreement. Likewise, they share in any surplus (loss) from the pool collectively. "*Takaful* system has a built-in mechanism to counter any over-pricing policies of the insurance companies because whatever may be the premium charged, the surplus would normally go back to the participants in proportion to their contributions". Moreover, *Takaful* is principally based on the concept of "social solidarity, cooperation and mutual indemnification of losses of members" (Khan, 2005; Gafoor, 2007).

According to Standard & Poor's (2006) and A.M. Best's Takaful Review (2012), a takaful manages two separate funds: one for shareholders and the other one for policyholders who considers as participants in the venture. The participants pay the takaful company a *"Wakala*" fixed-management fee or a "Mudaraba" profit-sharing fee, or a combination of both, as well as premium contributions to cover potential claims. In return, the insurer manages the various risks and pays claims against the accumulated funds.[1] The takaful company invests participants' contributions in Shari'ah acceptable assets to yield return. The investment management expenses are borne by the takaful company which in return shares in the profits with participants. If the accumulated fund runs short (cannot pay claims), shareholders are required to provide an interest-free loan "*qardh hasan*" to cover the deficit. On the other hand, if the accumulated fund runs a surplus, the excess may be distributed to policyholders. However, a Takaful model based on Mudaraba transaction is illustrated in the appendix (Fig.1.11).

1.4.4. Islamic bonds (Sukuk)

A bond is a contractual debt obligation whereby the issuer is contractually obliged to pay interest and principal to bondholders on certain specified dates (Thomas, Cox and Kraty, 2005). Sukuk commonly refers to the Islamic equivalent of bonds. Since interest bearing bonds are not permissible in Islam, Sukuk securities are structured to comply with the Islamic law and its investment principles. Sukuk are asset-backed, stable income and tradable Shari'ah compatible inv investment certificates. Sukuk is well described as "*Trust Certificate*" that grants the investor a sh-

[1] Takaful products are based on two main business models: **I)** The Mudarabah model which is essentially a basis for sharing profit and loss between the takaful operator and the policyholders. The takaful operator manages the operation in return for a share of the surplus on underwriting and a share of profit from investment. The profit as universally defined by conventional insurance companies is then shared according to a mutually agreed ratio between the participants and the operators. Management expenses of the operator including agency remuneration, if any, shall be borne by the shareholders' fund and not from the takaful funds. **II)** The Wakala model which is a contract of agency replaces surplus sharing with a performance fee. The takaful operator in this case acts as an agent for participants and manages the takaful/retakaful fund in return for a defined fee. The paid-up capital is contributed as donation by the shareholders. Therefore, the shareholders do not expect and probably do not mind for not receiving any returns on the capital donated (Economic Research & Consulting, 2011).

are of an asset along with the cash flows and risk commensurate with such ownership (Thomas, et al. 2005). Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) defines Sukuk as being: "*Certificates of equal value representing after closing subscription, receipt of the value of the certificates and putting it to use as planned, common title to shares and rights in tangible assets, usufruct and services, or equity of a given project or equity of a special investment activity*".

In practice, the basic condition of issuance of different types of Sukuk is the existence of assets on the balance sheet of a financial institution. The identification of suitable assets is arguably the most important step in the process of issuing Sukuk. This differentiates sukuk from traditional bonds as the latter proceed over interest bearing securities, whereas sukuk are, principally, investment certificates comprising of ownership claims in a pool of real assets (Kamali, 2007). "This discourages over-exposure of the financing facility beyond the value of the underlying asset, given that the issuer cannot leverage in excess of the asset value" (AIMS, 2005). The holders' of Sukuk claim an undivided beneficial ownership in the underlying assets. Sukuk holders, however, are entitled to share revenues generated by the sukuk assets, as well as, being entitled to share in the proceeds of the realization of the sukuk assets. Another distinguishing feature of sukuk is that they will not be tradable on the secondary market, but instead they held until maturity or even sold at par.

Sukuk can be of many types and techniques depending upon the type of Islamic modes of financing and trades used in its structuring. Among the 14 eligible sukuk identified by the (AAOIFI), the most important and common types of sukuk funds are shown in Table 1.4 (b) in the appendix.

1.5. Risks and challenges associated with Islamic finance and banking

The use of financial products that conform to the Islamic principles pose special risks and challenges. Consequently, efficient risk management in Islamic financial institutions has assumed particular importance as they try to cope with the challenges of globalization. This, however, requires the development of a suitable regulatory framework and new financial instruments to provide an enabling operational environment for Islamic finance. This section briefly highlights some of these risks and challenges which are particularly associated with Islamic finance.

1.5.1. Risks

There are general factors that make the operation of Islamic financial institutions riskier than conventional counterparts do: **I**) fewer risk-hedging instruments and techniques, **II**) under-developed or non-existent of the inter-bank money markets [2] and government securities, and **III**) the limited availability of and access to the lender-of-last-resort operated by central banks. By and large, Islamic financing contracts are exposed to market, liquidity, operational and credit risks, along with other risks resulting from the unique asset and liability structures of Islamic finance (Fig. 1.3) (Mounira and Anas, 2008).

Fig. 1.3: Islamic banking specific risks

1.5.1.1. Market risks

Like conventional banks, Islamic banks are also exposed to market risks. According to the IFSB, market risk refers to "*the potential impact of adverse price movements on the economic value of an asset" resulting in a "loss in on- and off-balance sheet positions*". In other words, market risk is the current and potential risk to earnings and stockholder's equity resulting from adverse movements in market rates or prices.

Market risks, however, generally consist of: interest rate risks, exchange rate risks, commodity

[2] Islamic money market products include for example: Al-Mudaraba Inter-bank Investment (MII), Islamic Inter-bank Cheque Clearing System (IICCS), Government Investment Certificate (GIC) and Islamic Accepted Bills (IAB), etc.

risks and equity price risks. Interest rate risk is one of the most important market risks faced by conventional financial institutions. Since Islamic banks do not deal in interest-based instruments, it has been argued that they relatively do not face this kind of risk. In reality, Islamic banks are indirectly confronted with this risk through the markup price of deferred sale and lease-based transactions. Islamic banks can't go against the traffic. The effective returns on Islamic deposit and financing accounts need to be of the same scale as the interest rate of conventional counterparties. The disparity in real returns may potentially represent a threat to the Islamic banking industry. Islamic banks may face the dilemma that their returns may be significantly above the rates achieved by conventional banks. Thus, may face the commercial risk of being overwhelmed by an influx of funds for which there is no short-term liquid market. They alternatively, may face the ethical dilemma of reducing the real return on their PLS investments to bring them in line with the low interest rates of conventional banks (Sarker, 2006).

Islamic banks explicitly use the (LIBOR) as a benchmark in their financing operations. Therefore, it is natural for their assets to be exposed to the risk of changes in the LIBOR rate (El-Gamal, 2003). A rise in LIBOR will lead to a rise in the mark-up and thus, lead to increase the payment of higher profits to future depositors compared with those received by the banks from the users of long-term funds. Chapra and Khan (2000) argue that the nature of investment deposits on the liabilities side of an Islamic bank adds an additional dimension to this risk. Profit rates to be paid to Mudaraba depositors by an Islamic bank will have to respond to changes in the market rate of mark-up. However, profit rates earned on assets cannot be raised because the price has been fixed on the basis of the mark-up rates of the previous period. In other words, any increase in new earnings has to be shared with depositors, but it cannot be re-adjusted on the assets side by re-pricing the receivables at higher rates (Sarker, 2006).

Additionally, Islamic banks are exposed to commodity price risk because, unlike conventional banks, they typically carry inventory items. They are also directly exposed to equity price risk as the vary nature of Islamic banking is equity financing through the PLS modes. Islamic banks are eventually exposed to the exchange rate risk in the same way as conventional peers (Sundararajan and Errico, 2002).

1.5.1.2. Liquidity risks

Liquidity risks is the current and potential risk to earnings and market value of stock-holders eq-

uity that result from banks inability to meet obligations as they come due. This is especially when there is an unexpected decline in a bank's net cash flow, or clearing obligations in a timely and cost effective manner. Liquidity risks refer also to the ability of a bank to cheaply and easily borrow a fund (Koch and MacDonald, 2009). In the conventional banking system with a well-developed interbank market, there are a variety of instruments available that the banks can make use of. Frequently, for the short-term requirements and to cover mismatches in maturity, the access to interbank money markets for short-term borrowings gives considerable flexibility to a bank to adjust its short-term cash flow. Secondary markets in financial instruments have also become an important source for liquidity, which banks can rely on to manage their liquidity position (Abdul Majid, 2003). As an insurance against being unable to cover an expected shortage of cash flow in the interbank market, banks desire to hold a portfolio of marketable securities that can be quickly liquidated in time of need (Lucas and McDonald, 1989). A bank can also use the discount window from the central bank as lender of last resort.

Similarly, Islamic banks have to meet their liquidity obligations to enable the smooth running of their business. The nature of Islamic banks have additional issues to be addressed in order to meet their liquidity needs in a Shari'ah complaint base (Malik and Mustafa, 2011). Many factors, however, come together to cause such a risk specific to Islamic banking (Fig. 1.4). The conventional mechanisms of liquidity management are all based on interest therefore, are not permissible for Islamic banks. Islamic banks are forced to hold higher non-productive liquidity reserves which could lead to a lower profitability and could ultimately destroy the shareholders value.

Fig. 1.4: The causes of liquidity problems in Islamic financial institutions

Source: Abdul Majid, International Conference on Islamic Banking: Risk Management, Regulation and Supervision -2003

The Islamic banking financing activities must be backed by tangible (real) assets, whereas in conventional banking, these activities can be carried out back-to-back without being backed by

any assets. Islamic assets are pre-dominantly long-term and relatively illiquid. This does not, however, present a problem because the majority of Muslim countries are flush with huge amount of cash. Under the normal market conditions, the mismatch between the assets duration which are long-term and illiquid and the liabilities which are short-term, can present a serious challenge. For Islamic banks, it is problematic to obtain cash at reasonable cost and to sell assets at a profitable price. This is mainly due to the strict Shari'ah restrictions on the securitization of debt instruments leading to the fact that banks have problems to sell its receivables.

1.5.1.3. Operational risks

Operational risk is considered a fundamental part of doing business and hence, cannot be fully eliminated. It has also considered a dominant risk and has contributed an even larger share of banks total risk. Operational risks refer particularly to the possibility that operating expenses might vary significantly from what is expected which could produce a decline in the net income and banks value (Koch and MacDonald, 2009; Grier, 2007). The Basel committee defines operational risk as "*the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events*". Operational risks are likely to be more significant for Islamic financial institutions due to their specific contractual features. According to the IFSB, operational risk in Islamic banks is associated with the loss resulting from "inadequate or failed internal processes, people and system, or from external events, including losses resulting from Shari'ah noncompliance and the failure in fiduciary responsibilities".

Operational risks in the Islamic framework may be due to various sources including: the unique corporate governance (CG) and control activates that Islamic banks should perform internally, the non–standardized nature of Islamic financial products and services (Sundararajan and Errico, 2002), the lack of an efficient Shari'ah system to enforce financial contracts and also the substantial *fiqh*-related risks which make banks as well as supervisory staff are not well-oriented in the knowledge of fiqh, this has had the effect of depriving Islamic banks of the utilization of many genuine risk management concepts which may not necessarily be in conflict with the Shari'ah (Chapra and Ahmed, 2002). Overall, operational risks arising in Islamic banks generally lead to shortfalls in bank's net income as compared with that expected and thus, create significant management problems (Chapra and Khan, 2000).

1.5.1.4. Credit risk

Credit risk in banking is commonly defined as "*the potential that the counterparty fails to meet its obligations in accordance with agreed terms*" (BIS, 2005). In an Islamic bank, credit risk is in the form of payment risk arising when one party to a business transaction pays money or deliver assets before receiving its own assets or cash, thereby exposing it to potential loss (Khan and Ahmed, 2001). Islamic banks need to be more rigorous in their credit appraisal system than conventional banks. Islamic banks face credit risk in most of the modes of financing they generally use. Credit risk can arise out of Mudaraba and Musharaka contracts in two ways: ***i)*** the entrepreneur might face a debt liability when he/she is liable to guarantee the capital in the case of negligence; ***ii)*** when the capital of Mudaraba and/or Musharaka is employed in a deferred sale, the capital's owner bears a risk pertains to the ability of the counterparties to repay (Elgari, 2003).

1.5.2. Challenges facing Islamic banking and finance

There are many challenges which are common to conventional banks. But there are several challenges which are particularly specific to Islamic financial institutions. Some of the most important challenges facing Islamic financial industry are identified briefly as follows (Fig. 1.5):

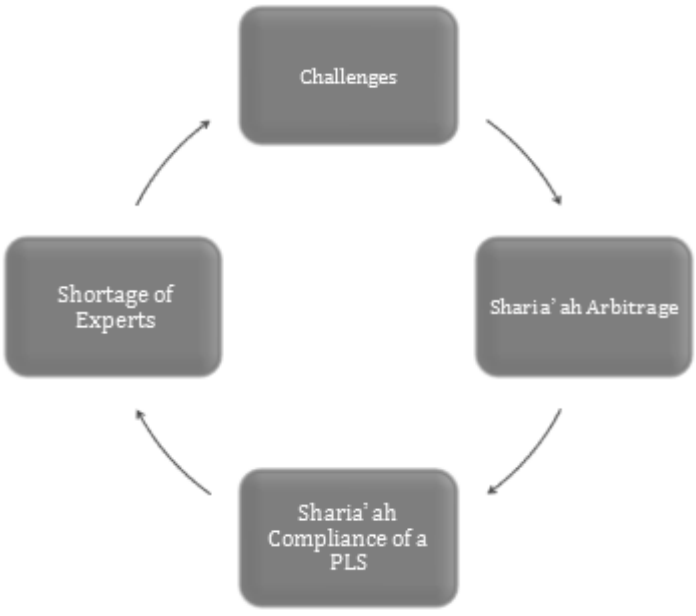


Fig. 1.5: Main challenges facing Islamic banking

1.5.2.1. Shari 'ah arbitrage

There is a diversity of opinion as to whether particular practices or services and products are sh-

ari'ah compliant or not (Wilson, 2007). This indicates that some products and services may be approved as being Islamic by some Shari'ah scholars but not by others. The significant differences in the well-known Muslim scholar's interpretation of the Islamic law relating to financial transactions can apply not only to products and services, but also to operations and financial systems. According to Akhtar (2007), reaching consensus and harmonized guidance among Islamic scholars of different beliefs, would let the industry significantly grow and strongly compete on level playing field. Additionally, a flexible and simpler interpretation of the basic Islamic tenets would also enhance the public acceptability for Islamic products.

1.5.2.2. Shari'ah compliance throughout the Islamic product's life cycle (PLS)

For Islamic finance providers, gaining approval from the Shari'ah Supervisory Board (SSB) on Shari'ah compliance of a product before its launch is not only necessary, but vital. What is also important for Islamic banks is recognizing that the Shari'ah compliance is a continuous process which particularly means that their products (or services) are adequately monitored (Mahmood, 2009). This has, however, implications for an Islamic bank's prudential requirements as well as conduct of business. Some products, if they breach Shari'ah compliance rules, "can adversely affect a bank's solvency by converting an asset into a liability on the balance sheet". However, efficient monitoring of Shari'ah compliance may involve reinforcing more effective SSB oversight through the internal auditing process and by developing knowledge and more expertise within an Islamic bank (Ainley et al. 2007; Toronto Financial Services Alliance, 2010).

1.5.2.3. Shortage of experts in Islamic banking

One main challenge to expanding the Islamic banking industry is the scarcity of not only the appropriately qualified Shari'ah scholars who must give their approval that an Islamic financial product does not contradict the religion's principles before it can be marketed, but also the executive specialists who are typically experts and well-versed in international and Islamic banking operations. In practice, the supply of trained and experienced bankers has lagged behind the expansion of Islamic banking (Ahmed, 2010). To cater the needs of the Islamic industry, both business and religious schools should offer specialist courses in conjunction with industry experts to prepare the next generation of Shari'ah scholars.

Appendix- Ch.1

Table 1.4. Types of Islamic investment funds, Islamic bonds, and Islamic derivatives**.**

A. Types of Islamic Investment Funds

Equity Funds

In an equity or mutual fund the amounts are invested in the shares of joint stock companies. The profits are derived through the capital gains by purchasing the shares and selling them when prices are increased. Profits are also earned through dividends distributed by the relevant companies.

Ijarah Funds

Ijarah means leasing. In this fund the subscription amounts are used to purchase assets like real estate, motor vehicles or other equipment for the purpose of leasing them out to their ultimate users. The ownership of these assets remains with the Fund and the rentals are charged from the users. These rentals are the source of income for the fund, which is distributed pro rata to the subscribers.

Commodities Funds

In commodity funds, subscriptions amounts are used in purchasing different commodities in order to resale them. The profits generated by the sales are the income of the fund, which is distributed pro rata among the subscribers.

Murabaha Funds

Murabaha is a specific kind of sale where the commodities are sold on a cost-plus basis. The contemporary Islamic banks and financial institutions as a node of financing have adopted this kind of sale. They purchase the commodity for the benefit of their clients, and then sell it to them on the basis of deferred payment at an agreed margin of profit added to the cost.

Mixed Funds

Another type of Islamic Fund may be of a nature where the subscription amounts are employed in different types of investments, like equities, leasing, commodities etc. This may be called a Mixed Islamic Fund. In this case if the tangible assets of the Fund are more than 51% while the liquidity and debts are less than 50% the units of the fund may be negotiable. However, if the proportion of liquidity and debts exceeds 50%, its units cannot be traded in according to the majority of the contemporary scholars. In this case the Fund must be a closed-end Fund.

B. Types of Islamic Bonds - Sukuk Funds

Mudaraba Sukuk

These are investment sukuk that represent ownership of units of equal value in the Mudaraba equity and are registered in the names of holders on the basis of undivided ownership of shares in the Mudaraba equity and its returns according to the percentage of ownership of share. The owners of such sukuk are the "rabbul-mal". Mudarba sukuk are used for enhancing public participation in big investment projects.

Musharaka Sukuk

These are investment sukuk that represent ownership of Musharaka equity. It does not differ from the Mudaraba sukuk except in the organization of the relationship between the issuer and holders of them, whereby the party issuing sukuk forms a committee from the holders of the sukuk who can be referred to in investment decisions. Musharaka Sukuk are used for mobilizing the funds for establishing a new project or developing an existing one or financing a business activity on the basis of partnership contracts. The certificate holders become the owners of the project or the assets of the activity as per their respective shares. These Musharaka certificates can be treated as negotiable instruments and can be bought and sold in the secondary market.

Ijara Sukuk

These are sukuk that represent ownership of equal shares in a rented real estate or the usufruct of the real estate. These sukuk give their owners the right to own the real estate, receive the rent and dispose of their sukuk in a manner that does not affect the right of the lessee, i.e. they are tradable. The holders of such sukuk bear all cost of maintenance of and damage to the real estate. Ijarah sukuk are the securities representing ownership of well defined existing and known assets tied up to a lease contract, rental of which is the return payable to sukuk holders. Payment of ijarah rentals can be unrelated to the period of taking usufruct by the lessee. It can be made before beginning of the lease period, during the period or after the period as the parties may mutually decide. This flexibility can be used to evolve different forms of contract and sukuk that may serve different purposes of issuers and the holders.

Murabaha Sukuk

In this case the issuer of the certificate is the seller of the Murabaha commodity, the subscribers are the buyers of that commodity, and the realised funds are the purchasing cost of the commodity. The certificate holders own the Murabaha commodity and are entitled to its final sale price upon the re-sale of the Commodity. The possibility of having legally acceptable Murabaha-based sukuk is only feasible in the primary market. The negotiability of these Sukuk or their trading at the secondary market is not permitted by shariah, as the certificates represent a debt owing from the subsequent buyer of the Commodity to the certificate-holders and such trading amounts to trading in debt on a deferred basis, which will result in riba. Despite being debt instruments, the Murabaha Sukuk could be negotiable if they are the smaller part of a package or a portfolio, the larger part of which is constituted of negotiable instruments such as Mudaraba, Musharaka, or Ijara Sukuk. Murabaha sukuk are popular in Malaysian market due to a more liberal interpretation of fiqh by Malaysian jurists permitting sale of debt (bai-al-dayn) at a negotiated price.

Salam Sukuk

Salam sukuk are certificates of equal value issued for the purpose of mobilizing Salam capital so that the goods to be delivered on the basis of Salam come to the ownership of the certificate holders. The issuer of the certificates is a seller of the goods of Salam, the subscribers are the buyers of the goods, while the funds realized from subscription are the purchase price (Salam capital) of the goods. The holders of Salam certificates are the owners of the Salam goods and are entitled to the sale price of the certificates or the sale price of the Salam goods sold through a parallel Salam, if any. Salam-based securities may be created and sold by an SPV under which the funds mobilized from investors are paid as an advance to the company SPV in return for a promise to deliver a commodity at a future date. SPV can also appoint an agent to market the promised quantity at the time of delivery perhaps at a higher price. The difference between the purchase price and the sale price is the profit to the SPV and hence to the holders of the Sukuk. All standard

shari'ah requirements that apply to Salam also apply to Salam sukuk, such as, full payment by the buyer at the time of affecting the sale, standardized nature of underlying asset, clear enumeration of quantity, quality, date and place of delivery of the asset and the like. One of the Shari'ah conditions relating to Salam, as well as for creation of Salam sukuk, is the requirement that the purchased goods are not re-sold before actual possession at maturity. Such transactions amount to selling of debt. This constraint renders the Salam instrument illiquid and hence somewhat less attractive to investors. Thus, an investor will buy a Salam certificate if he expects prices of the underlying commodity to be higher on the maturity date.

Istisna Sukuk

Istisna sukuk are certificates that carry equal value and are issued with the aim of mobilizing the funds required for producing products that are owned by the certificate holders. The issuer of these certificates is the manufacturer (supplier/seller), the subscribers are the buyers of the intended product, while the funds realized from subscription are the cost of the product. The certificate holders own the product and are entitled to the sale price of the certificates or the sale price of the product sold on the basis of a parallel Istisna, if any. Istisna Sukuk are quite useful for financing large infrastructure projects. The suitability of Istisna for financial intermediation is based on the permissibility for the contractor in Istisna to enter into a parallel Istisna contract with a subcontractor. Thus, a financial institution may undertake the construction of a facility for a deferred price, and sub contract the actual construction to a specialized firm. Shari'ah prohibits the sale of these debt certificates to a third party at any price other than their face value. Clearly such certificates cannot be traded in the secondary market.

Hybrid Sukuk

Considering the fact that Sukuk issuance and trading are important means of investment and taking into account the various demands of investors, a more diversified Sukuk - hybrid or mixed asset Sukuk - emerged in the market. In a hybrid Sukuk, the underlying pool of assets can comprise of Istisna, Murabaha receivables as well as Ijara. Having a portfolio of assets comprising of different classes allows for a greater mobilization of funds. However, as Murabaha and Istisna contracts cannot be traded on secondary markets as securitized instruments at least 51% of the pool in a hybrid Sukuk must comprise of Sukuk tradable in the market such as an Ijara Sukuk. Due to the fact the Murabaha and Istisna receivables are part of the pool, the return on these certificates can only be a pre-determined fixed rate of return.

Source: Data are directly obtained" as is" from AIMS-UK, (2011); Ayub, (2007); Usmani(2004), and Bond.my (2009-2010)

C. Islamic derivatives

Financial derivatives are instruments whose payoffs are linked to previously issued securities. These are for example forwards, futures, options and swaps. In the conventional banking sector, derivative instruments are extensively used for two reasons, hedging and speculation. The purpose of hedging is to reduce the bank's and customers' exposure to certain risks while speculators generate risk so they can benefit from the increased return that risk brings. Due to the obvious involvement of Gharar and Maysir, all forms of speculation are regarded *islamically unacceptable* despite their importance for financial sector development. Consequently, the use of derivatives for speculation is not permissible (Salehabadi and Aram, 2002). Hedging is allowed for Islamic financial institutions as the derivative instruments and the underlying assets are structured and chosen in conformity with Islamic law requirements. Some Shari'ah scholars accept to consider hedging as islamically permissible with the aim of protecting investors from risks of increased market's volatility.

The features of conventional derivatives that originally contradict with Shari'ah requirements are: *Firstly*, the underlying asset is not actually delivered to the owner but rather he/she receives in cash the difference between the strike price and the spot price of the underlying.[(3)] In this way, the contract is about "a fictitious good" which contradicts the basic principles of Islamic finance. *Secondly*, for many conventional derivatives both payment and (fictional) delivery take place in the future. This is generally non-permissible for Islamic finance contract as well as the trade of liabilities. *Finally*, the evaluation of conventional derivatives is often based on the interest-based models. Hence, they cannot be used for risk mitigation by Islamic financial institutions (Gassner and Wackerbeck, 2007).

However, general approaches can be used to find a solution for the above mentioned problems. On the one hand, a number of contracts exist in Islamic finance could be considered a basis for derivative contracts within an Islamic framework particularly *Salam* structures. On the other hand, new Islamic products are developed, which are not applied in practice so far such as *Khiyar and Istijrar* (Bacha, 1999). For both approaches, the admissibility is disputed by Shari'ah scholars. The Islamic Financial Services Board (IFSB) holds that: "*For risk mitigation instruments (in particular, derivatives) such as the Islamic profit rate swap, foreign exchange swap, forward (using the Salam principle), forward foreign exchange (using Wa`d principle), options (using `urbun principle), futures contract and Bay` al-Istijrar contracts, only half of the jurisdictions surveyed accepted these contracts as Shari'ah permissible*". However, the different Shari'ah interpretations among jurisdictions have resulted in non-uniformity in the acceptance and design of Shari'ah compliant alternatives. Therefore, in reality, adequate alternatives to conventional derivatives are very rare in the novel Islamic financial industry and far between in countries where the compatibility of capital market [(4)] transactions with Islamic law requires the development of Shari'ah-compliant structures.

[(3)] Spot: commodity and money exchanged simultaneously, both on (t+0). Future: both money and commodity are deferred until the future (t+1). Deferred: commodity is delivered (t+0), but money is paid on a deferred basis (t+1). Salam: the opposite of a deferred contract; in Salam money is paid immediately (t+0), but the commodity is delivered in the future (t+1). According to the vast majority of Shari'ah scholars, the three types of transactions (spot, deferred and Salam) are valid contracts. However, in futures contracts, the delivery is generally done by cash (i.e. the monetary difference is settled) rather than physical exchange of the commodity. As a result, some scholars contend that such contracts are primarily used for speculative purposes (Islamicbanker.com, 2011).

[(4)] The Islamic capital market functions as a parallel market to the conventional capital market for capital seekers and providers. Like any capital market, the primary function of Islamic capital market is to allow people, companies, and governments with surplus funds to transfer them to those who need the funds. Basically, there are two products largely responsible for the serious growth of the Islamic capital market: Shari'ah-compliant equity funds and Sukuk (Islamic bonds). However, the market has expanded to include exchange-traded funds, derivatives, swaps (*the Islamic swap market is a subset of the overall Islamic derivative market. A swap is a derivative instrument that is used to transfer risk. The major Islamic swap structures are the profit rate swap to a hedge against fluctuations in borrowing rates, and the cross-currency swap to transfer the risk of currency fluctuation*), Islamic Unit Trusts, Islamic Exchange-Traded Funds, and Islamic Commodity Funds.

Fig. 1.6-1.11: Islamic modes of finance: some examples

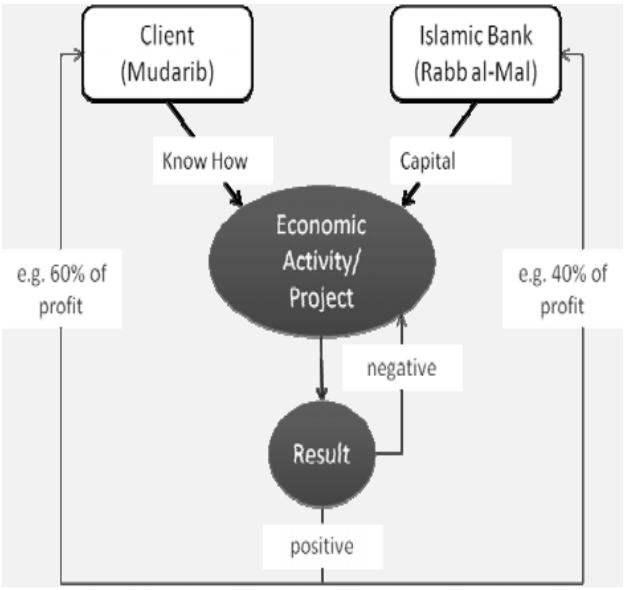


Fig. 1.6: Mudaraba transaction,Gassner & Wackerbeck, (2007)

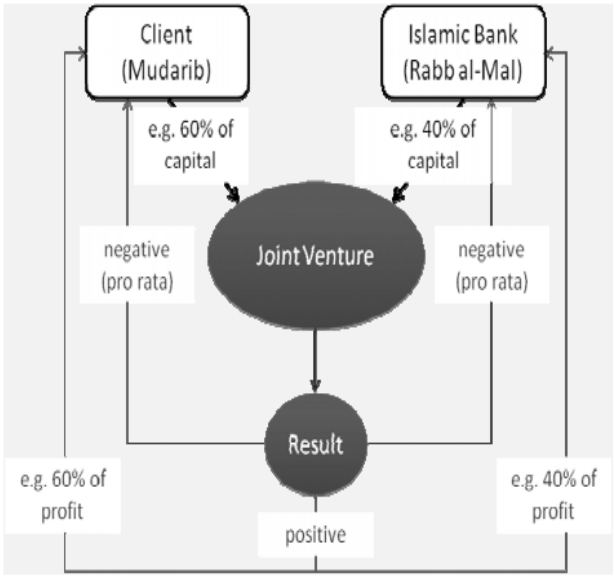


Fig. 1.7: Musharaka transaction,Gassner & Weckerbeck, (2007)

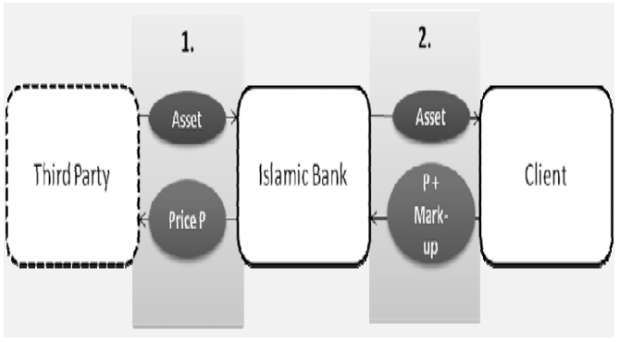


Fig. 1.8: Murabaha transaction, Colditz, (2009)

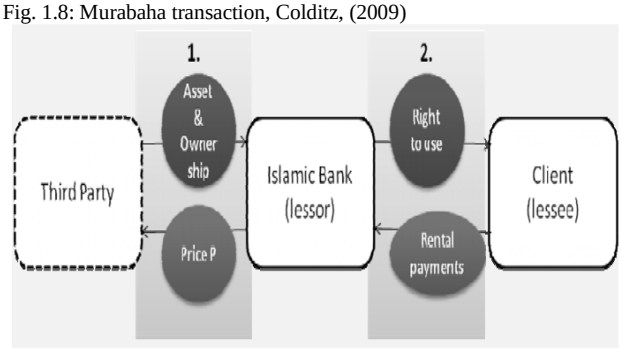


Fig. 1.9: Pure Ijara transaction, Colditz, (2009)

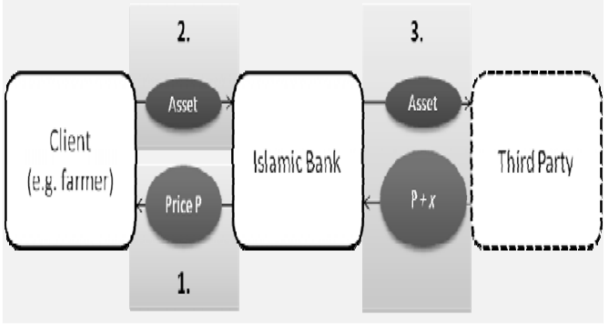


Fig. 1.10: Salam transaction, Colditz, (2009)

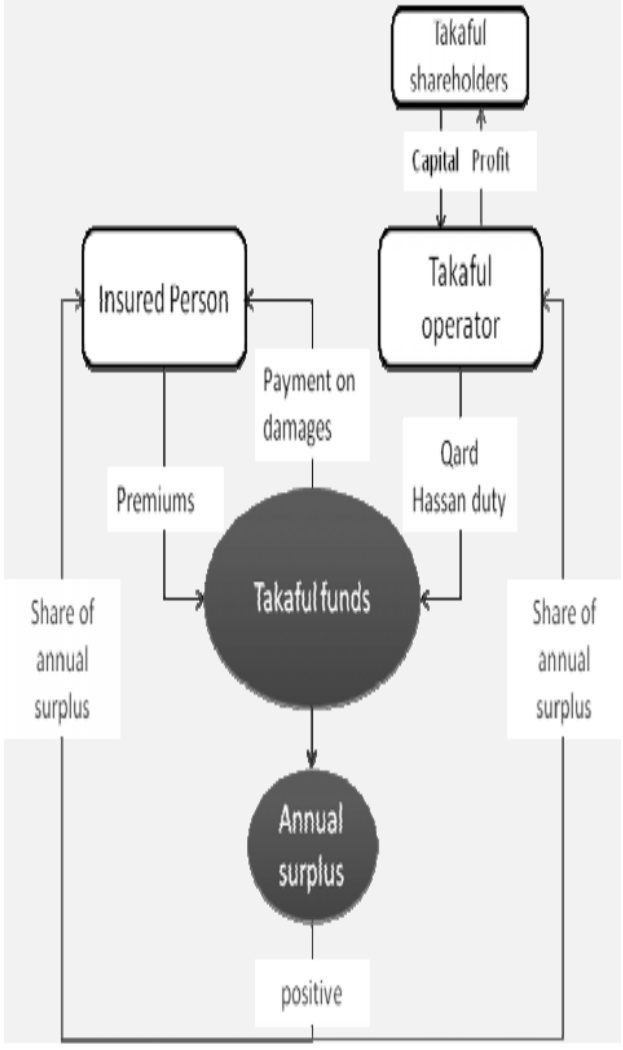


Fig. 1.11: Takaful model based on Mudaraba, Gassner and Weckerbeck, (2007)

References

Abdul Majid, A., R. (2003) 'Development of Liquidity Management Instrumnets: Challenges and Opportunites', International Conference on Islamic Banking: Risk Management, Regulation and Supervision, Sep.30-Oct.3, Indonesia.

Abedifar, P., Molyneux, P., and Tarazi, A. (2012) 'Risk in Islamic Banking', Electronic copy available at: SSRN: http://ssrn.com/abstract=1663406 (accessed 12 Feb. 2012)

Academy for International Modern Studies-AIMS. (2010) 'Islamic Banking & Finance: Free Study Notes', Electronic ref. available at: http://www.learnislamicfinance.com/Free-Study-Notes.htm

Ahmad, A. U. F., and Hassan, M. K. (2007) 'The Time Value of Money Concept in Islamic Finance', the American Journal of Islamic Social Sciences, Vol. 23, No.1

Ahmed, U. (2010) 'Challenges facing Islamic banking industry', Business Recorder, Nov.12. Available at: http://www.meezanbank.com/docs/brecorder.pdf (accessed 12 Feb. 2011)

Ainley, M., Mashayekhi, A., Hicks, R., Rahman, A., and Ravalia A. (2007) 'Islamic Finance in UK: Regulation and challenges', Financial Services Authority-FSA. Nov. Available at: http://www.fsa.gov.uk/pubs/other/islamic_finance.pdf (accessed 20 Jan. 2009)

Akhtar, S. (2007) 'Islamic Finance Growth, Competitiveness and Sustainability', 14th World Islamic Banking Conference, Bahrain, Dec.

Al-Jarhi, M. A. (2004) 'Islamic Finance and development', Seminar on "The Prospects of Arab Economic Cooperation To Boost Savings and Investment", organized by AAST, Alexandria, Egypt, June 16-18

Al-Jarhi, M. A. (2005) 'The Case for Universal Banking as a Component of Islamic Banking', Islamic Economic Studies, Vol. 12, No. 2

Al-Jarhi, M. A. (2009) 'Islamic finance: an efficient & equitable option', The Islamic Research and Training Institute, IDB. Jeddah, Saudi Arabia

Al-Jarihi, M., A., and Iqbal. M. (2001) 'Islamic Banking: Answers to Some Frequently Asked Questions', Islamic Development Bank (IDB). Occasional Paper No.4.

Algaoud, L.M. and Lewis, M.K. (2007) 'Islamic critique of conventional financing', in the Handbook of Islamic Banking, M. Kabir Hassan and M.K. Lewis (eds.), Edward Elgar, Cheltenham, UK and Northampton, Mass, pp. 38-48.

AL-saati, A. (2003) 'The Permissible Gharar (Risk) in Classical Islamic Jurisprudence', J.KAU: Islamic Econ.,Vol. 16, No. 2, pp. 3-19.

Ayub, M. (2007) 'Understanding Islamic Finance', John Wiley and Sons Ltd. England

Bacha, O., I. (1999) 'Derivative Instruments and Islamic Finance: Some Thoughts For A Reconsideration', International Journal of Islamic Financial Services, Vol. 1, No. 1.

Benjelloun, H. (2010) 'Financial leverage and the channeling of resources: profit loss sharing under the framework of Islamic financial institutions', Banks and Bank Systems, Vol. 5, Issue 4

Bleher, S., M. (2008) 'The facts about Usury: Why Islam is Against Lending Money at Interest', Islamic Party of Britain. Islamic Awareness. Available at: http://www.islamic-awareness.org/History/usury.html (accessed 17 March. 2009)

Booz & Company (Dr. Philipp Wackerbeck). (2011) 'Islamic Banking after the Financial Crisis', Workshop on Islamic Banking & Finance, Universität Hohenheim, Feb. 18.

Brownlow, D. and Shafique, M. (2009) 'Interest rate risk: a threat to the Islamic banking system?', New horizon, Issue No. 171, April–June.

Chapra, M. U. (1983) 'Monetary Policy in an Islamic Economy', Institute of Policy Studies, Islamabad, Pakistan, pp. 27 – 68.

Chapra, M.U. (1984) 'The Nature of Riba in Islam', Hamdard Islamicus, Vol. 7, Issue: 1, pp. 3-24.

Chapra, M. U. (1986) 'Towards a Just Monetary System', The Islamic Foundation, Leicester, UK.

Chapra, M., U., and Ahmed, H. (2002) 'Corporate Governance in Islamic Financial Institutions', Islamic Development Bank, Occasional paper No. 6.

Chapra, M. U., and Khan, T. (2000) 'Regulation and supervision of Islamic banks', Occasional Paper No. 3, Islamic Development Bank. Available at: http://www.sbp.org.pk/departments/ibd/Regulation_Supervision.pdf (accessed 26 May. 2008)

Clarke, F., Craig, R., and Hamid, S. (1996) 'Physical Asset Valuation and Zakat: Insights and Implications', Advances in International Accounting, Vol. 9, pp. 195-208.

Colditz, K. (2009) 'Islamic banking, a worthwhile challenge for German banks? The current supply situation of Islamic financial products in selected European markets and potential domestic market demand in Germany', Diploma Thesis. Georg-Simon-Ohm-Hochschule Nürnberg. Available at: http://www.assaif.org/content/download/4097/23916/file/Thesis%20Islamic%20Bankingl.pdf

Cole, Harold L., Stockman, and Alan C. (1992) 'Specialization, transactions technologies, and money growth', International Economic Review, Vol. 33, pp. 283–98.

DOW-JONES Islamic Market Index screen (2005) 'Dow Jones Indexes Announces Changes to Dow Jones Islamic Market Indexes. Available at: http://press.djindexes.com/index.php/dow-jones-indexes-announces-changes-to-dow-jones-islamic-market-indexes/ (accessed 29 July. 2009)

Dusuki, A.,W. (2006) 'Corporate Governance and Stakeholder Management of Islamic Financial Institutions', National Seminar in Islamic Finance, KUIM, Nilai, Aug. 20th -30th. Available at: http://www.asyrafwajdi.com/download.php?f=0009(downloaded-from-asyrafwajdi.com).pdf

Economic Research & Consulting (2011) 'Islamic insurance revisited', Swiss Reinsurance Company. Avilable at: http://www.biztositasiszemle.hu/files/201110/islamic_insurance_revisited_final[1].pdf

El-Gamal, M., A. (2003) 'Interest and the Paradox of Contemporary Islamic Law and Finance', Fordham International Law Journal, Vol. 27, Issue 1.

El-Gamal, M. (2006) 'Islamic Finance Law, Economics, and Practice', Cambridge University Press, UK.

Elgari, M., A. (2003) 'Credit Risk in Islmaic Banking and Finance', Islamic Economic Studies, Vol. 10, No. 2.

Elmelki, A., and Ben Arab, M. (2009) 'Ethical Investment and the Social Responsibilities of the Islamic Banks', International Business Research, Vol.2, No.2

Friedman, M. (1963) 'Inflation: Causes and consequences', Asia Publishing House (for Council for Economic Education), Bombay. Reprinted 1968. In Dollarsand deficits, pp.21–71. Englewood Cliffs, N.J. : Prentice-Hall.

Gafoor, A.L.M. A. (2007) 'Lending and Borrowing: An Overview', Islamic Finance Experet. Avilable at: http://ifinanceexpert.wordpress.com/2007/02/ (accessed 2 Oct. 2010)

Gassner, M., and Wackerbeck, P. (2007) 'Islamic Finance-Islam-gerechte Finanzanlagen und Finanzierungen', Köln: Bank-Verlag Medien GmbH.

Hasan, K. (2007) 'Monetary Policy In Islamic Economic Framework: Case of Islamic Republic of Iran', MPRA p. No.4837. Avilable at : http://mpra.ub.uni-muenchen.de/4837/

Hassan, K., and Kayed, R. (2009) 'The global financial crisis, risk management and social justice in Islamic finance', ISRA International Journal of Islamic Finance, Vol. 1, Issue 1.

Hesse, H., Jobst, A. (A.), and Solé; J. (2008) 'Trends and Challenges in Islamic Finance', World Economics, Vol. 9, No. 2.

IFSL Research (2010) 'Islamic Finance 2010', Electronic copy avilable at: http://www.thecityuk.com/media/2373/IFSL_Islamic_Finance_2010.pdf (accessed 8 Nov. 2009)

Iqbal, J. (2009). Islamic Financial Management', Global Vision Publishing House, New Delhi.

Iqbal, Z. (1997) 'Islamic Financial Systems', Finance & Development, Vol. 34, pp. 42-45.

Iqbal, Z., and Abbas M. (2007) 'An Introduction to Islamic Finance: Theory and Practice', John Wiley & Sons (Asia) Pte Ltd, Singapore.

Islamicbanker.com (2009) 'Islamic Derivatives: Paradox or Panacea?', Electronic copy avilable at: http://www.islamicbanker.com/EducationArticles/Islamic-Derivatives (accessed 3 Nov. 2009)

Islamic Banking and Islamic Insurance (2011) 'Glossary of Financial Terms', Electronic copy available at: http://www.islamic-banking.com/glossary_of_key_terms.aspx (accessed 5 Jan. 2011)

Jobst, A., A. (2005) 'What is Structured Finance? ', The Securitization Conduit, Vol. 8, No. 6

Kamali, M., H. (2007) 'A Shari'ah Analysis of Issues in Islamic Leasing', J.KAU: Islamic Econ., Vol. 20 No. 1, pp. 3-22

Karim, N., Michael T., and Xavier R. (2008) 'Islamic Microfinance: An Emerging Market Niche', Focus Note 49. Washington, D.C.: CGAP, August.

Kettell, B. (2011) 'Introduction to Islamic Banking and Finance', 1st edition, Wiley Finance, UK

Khan, F. (1984) 'Comments on Volker Nienhaus: Profitability of Islamic Banks Competing with Interest Banks', JRIE, Vol. 1, No.1, Summer 1983', J. Res. Islamic Econ., Vol. 1, No. 2, pp. 69-73

Khan, A. (2008) 'Islamic Microfinance: Theory, Policy and Practice. Islamic Relief Worldwide (IRW)', Birmingham, UK. Avilable at:

http://www.islamicrelief.com/InDepth/downloads/Islamic%20Microfinance%20%20Theory%20Policyand%20Practice.pdf (accessed 5 Jan. 2009)

Khan, A. A., and Mould, H. (2008) 'Islam and Debt', Islamic Relief Worldwide (IRW), Birmingham, UK, April. Available at: http://www.islamic-relief.com/indepth/downloads/islamanddebt.pdf (accessed 5 Jan. 2009)

Kiaee, H. (2007) 'Monetary Policy In Islamic Economic Framework: Case of Islamic Republic of Iran', MPRA P. No.4837. April. Avilable at: http://mpra.ub.uni-muenchen.de/4837/ (accessed 9 Feb. 2009)

Koch, T.,W., and MacDonald, S. (2009) 'Bank Management', (7th ed.), Thomson South-Western, US

Luca, E., and Vasudevan, S. (2002) 'Islamic Financial Institutions and Products in the Global Financial System: Key Issues in Risk Management and Challenges Ahead', IMF, WP No. 02/192. Avilable at: http://www.imf.org/external/pubs/ft/wp/2002/wp02192.pdf (accessed 9 Feb. 2009)

Lucas, D., and McDonald R., L. (1989) 'Bank Portfolio Choice with Private Information About Loan Quality: Theory and Implications for Regulation', NBER Working Paper No. 2421, June. Avilable at: http://www.nber.org/papers/w2421.pdf?new_window=1 (accessed 9 March. 2010)

Malik, S., M. Malik, A., and Mustafa, W. (2011) 'Controversies that make Islamic banking controversial: An analysis of issues and challenges', Amarica Journal of Social and Manageent Sciences, Vol. 2, No.1, pp. 41-46

Mahmood, R. (2009) 'Islamic Governance, Capital Structure, and Equity Finance: Examining the Possibilities of American Financial Shari'ah Boards', Cornell Law Faculty, WP. 50. Avilable at : http://scholarship.law.cornell.edu/clsops_papers/50 (accessed 9 Sep. 2009)

Mounira, B., A., and Anas, E. (2008) 'Managing Risks and Liquidity in an Interest Free Banking Framework: The Case of the Islamic Banks', International Journal of Business and Management, Vol. 3, No. 9

Njanike, K. (2009) 'The revelance of Islamic banking in developing economics: A case of Zimbabwe', Journal of Sustainable Development in Africa, Vol. 11, No.3

Obaidullah, M. (2009) 'Some Issues In Shari'ah Compliance & Regulation of Islamic Funds', J.KAU: Islamic Econ., Vol. 22 No. 1, pp. 75-78

Salehabadi, A., and Aram, M. (2002) 'Islamic Justification of Derivatives Instruments', International Journal of Islamic Financial Services, Vol.4, No.3

Sarker, A., A. (2006) 'CAMELS Rating System in the Context of Islamic Banking: A Proposed 'S' for Shari'ah Framework', Journal of Islamic Economics and Finance, Vol. 1, No.1, pp. 78-84.

Schacht, J. (1964) 'An Introduction to Islamic Law', Clarendon Press, Oxford.

Shahid, S. (2007) 'Role of Islamic banks in economic development', MPRA Paper No.7332. Dec. Avilable at: http://mpra.ub.uni-muenchen.de/7332/2/MPRA_paper_7332.pdf (accessed 9 Sep. 2009)

S.M. Ghazanfar and A. Azim Islahi (1990) 'Economic Thought of an Arab Scholastic: Abu Hamid al-Ghazali', History of Political Economy, (Durham, USA), Vol. 22, No.2, pp.381-403.

Siddiqi, M.N. (1996) 'Role of Fiscal Policy in Controlling Inflation in Islamic Framework', Centre for Research in Islamic Economics, Jeddah, Saudi Arabia. Avilable at: http://www.siddiqi.com/mns/FiscalPolicy.html (accessed 9 Feb. 2011)

Siddiqi, M.N. (2004) 'Riba and Bnak interest, the rational of its prohibtion', Islamic Research and Training Institute, IDB. Avilable at: http://www.globalwebpost.com/farooqm/study_res/i_econ_fin/nejatullahs_riba.pdf (accessed 9 Dec. 2009)

Siddiqi, M. N. (2008) 'Current Financial Crisis and Islamic Economics', Oct. Available at: http:/www.isdbforum.org/Subjects/Islam_and_the_Financial_Crisis/mnsiddiqi.pdf (accessed 17 May. 2009). Published also in 'Issues in the International Financial Crisis from an Islamic Perspective', Islamic Economic Research Center, King Abdulaziz University, Jeddah (2009).

Sundararajan, V., and Errico, L. (2002) 'Islamic Financial Institutions and Products in the Global Financial System: Key Issues in Risk Management and Challenges Ahead', IMF Working Paper No. 02/192. Available at: http://www.imf.org/external/pubs/ft/wp/2002/wp02192.pdf (accessed 26 May. 2010)

The Bank for International Settlements-BIS. (1999) 'Principles for the Management of Credit Risk', Basel, Switzerland, July. Avilable at: http://www.bis.org/publ/bcbs54.htm (accessed 29 Aug. 2010)

The National Bureau of Asian Research (2008) 'Islamic Finance: Global Trends and Challenges', Vol. 18, No. 4. Standard & Poor's, "Islamic Finance Outlook 2008"

Thomas, S., Cox S., and Kraty B. (2005) 'Structuring Islamic Finance Transactions', Euromoney, UK

Uhlig, H. (2000) 'Should We be Afraid of Friedman's Rule', Journal of the Japanese and International Economies, Vol. 14, pp. 261–303

Usmani, M. T. (2005) 'An Introduction to Islamic Finance', Idara Isha'at-E-Diniyat (P) Ltd

Visser, H. (2009) 'Islamic Finance principles and practices', Edward Elgar, UK

Wilson, C. (1979) 'An infinite horizon model with money', in JerryR., Green and José Alexandre Scheinkman (eds.), General equilibrium, growth, and trade: Essays in Honor of L. McKenzie, Academic Press, 79-104, NewYork.

Wilson, R. (2007) 'Credit risk management in Islamic Finance', Wilson's presentation at the IIBI's monthly lecture, London, March. Available at: http://www.newhorizonislamicbanking.com/index.cfm?section=academicarticle&action=view&id=10484 (accessed 29 Nov. 2009)

World Takaful report. (2008) 'Highlighting a new growth opportunity in Islamic finance', Electronic copy avilable at: http://www.assaif.org/content/download/273/1854/file/The%20World%20Takaful%20Report.pdf (accessed 13 Sep. 2009)

Zainal, M., P. (2009) 'Insuring Shari'ah Based Deposits', The Deposit Insurance Conference in the MENA Region: Enhancing Confidence, Nov. 18-19. Avilable at: http://www.dic.gov.jo/arabic/images/stories/CONFERENCEPRESENTEATION/insuring_shariah_based_deposits_final1_a-bezalzenal.pdf (accessed 13 Sep. 2010)

Zarqa, A., M. (1983) 'An Islamic Perspective on the Economics of Discounting in Project Evaluation', In "Fiscal Policy and Resource Allocation in Islam" ed. Ziauddin Ahmed, Munawar Iqbal and M. Fahim Khan, IPS, Islamabad.

Chapter 2

The Global Emergence and Growth of Islamic Finance

2.1. Foreword

Recently, Islamic finance is crossing the religious boundaries and has witnessed incredible growth, both in terms of assets and geographical spread. This is primerly because it is being seen as an ethical business model. Islamic finance is maturing into a global phenomenon as highlighted by the increasing appetite for Islamic instruments across the international financial market. Consequently, Islamic finance has the potential to emerge as a mainstream alternative to conventional investments, either in Muslim or non-Muslim world.

However, this chapter explores the emergence, evolution and rapid growth of Islamic finance within and outside the interest-based financial systems. More specifically, it provides a detailed overview of the Islamic banking and finance sector worldwide: firstly, by presenting a brief analysis of the Islamic finance penetration in the Middle East and Africa; secondly, by analysing the development of the Islamic finance within Europe and the rest of the world.

2.2. International Islamic financial market (IIFM): An overview

It is generally accepted that the modern Islamic finance came in the first part of 1960s with the establishment of the *Myt Ghamr* local savings bank in Egypt and the *Pilgrims'* Management and Funds in Malaysia (Kahf, ahmad and homud, 1998). In 1975, Dubai Islamic Bank (DIB), the world's first Islamic commercial bank was established in UAE followed by the establishment of Islamic Development Bank (IDB) in Jeddah, Saudi Arabia (Iqbal and Molyneux, 2005). During the 1980s, 1990s and beyond, the industry of Islamic finance expanded steadily and spreading around the globe. The demand for Islamic investments began to grow rapidly within and outside Muslim-majority countries (HM-Treasury, 2008). Nowadays, the ideas and concepts of Islamic

finance are attracting Muslim and non-Muslim investors seeking to invest into new business opportunities in many parts of the world.

The Islamic banking and finance industry is set to grow 15-20% annually (CBB, 2008). This growth has become particularly visible since 2001 mainly due to the increased oil wealth across GCC-states (Ayoub, 2007). The GCC-States is growing in importance as an economic and trading hub. In 2020, the Gulf States is projected to be a US-$2 tr. economy, providing nearly 1/4 of the world's oil supplies and thus, will achieve average annual growth of 4.5% compared with the aggregate global rate of 3.3%. Consequently, Gulf investors and sovereign wealth funds intensify and diversify their Shari'ah-compliant assets into Asia and Africa (see Exhibit 2.1) (The Economist, 2009). Another possible reason for such growth in Islamic finance is the enormous repatriation of capital to the Gulf region from Muslims around the world after the attacks of Sep. 11. "Due to this attack, experts forecast that Islamic banking could wrongly be brought into low appreciation. In fact, the opposite was the case, although Islamic banking indeed was acceptable than ever before. Capital invested by Muslims in the US did flow back to Arab countries due to the unproven claim of money laundering for the purpose of terrorism financing. Arab entrepreneurs instead feared that their accounts would be frozen in the US. This flow back of capital triggered an even faster development of Islamic banking by Islamic banks and Islamic windows of conventional banks in Muslim countries" (Burghardt and Fuss, 2004).

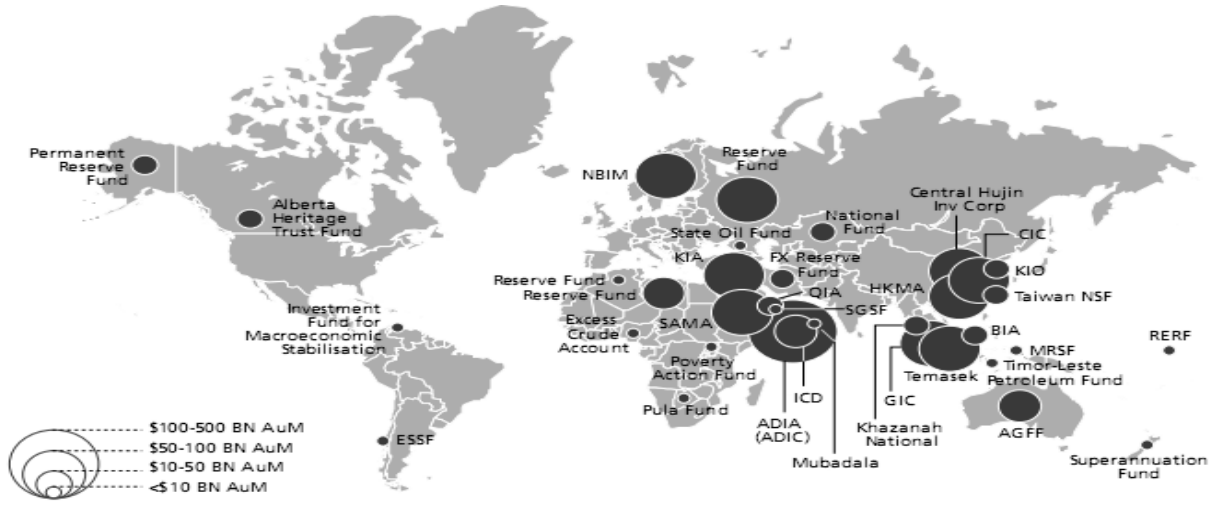


Exhibit 2.1: Map Showing Concentration of Sovereign wealth funds in Islamic financial markets
Source: Wyman, O., (2009)

The coverage and extent of Islamic banking and finance vary considerably from countries where the sector is totally Islamic such as Pakistan and Iran, to others where conventional and Islamic systems coexist with each other such as Malaysia and GCC-States. Many countries also allowed conventional banks to set up Islamic windows[1], opening the way for some of the promi-

nent international banks to get involved. The growth in Islamic finance, however, has been driven mostly by Muslim countries from GCC-States and Asia, and is designed to meet the needs of Muslims around the world. In most countries, financial institutions that involved in Islamic finance are growing faster than counterparties-conventional banks due to the strong demand for products and services complied with the ethical and moral Islamic investment guidelines.

Islamic financial sector is expanding in the local Islamic financial sector to serve Muslims and non-Muslims who favor ethical and socially useful investments. For example, up to 25% of Islamic accounts in Islamic banks in Malaysia are opened by non-Muslims (BBC News, 2006). However, despite that the key centers of Islamic financial services are concentrated in Muslim countries, the trend is increasingly going global where large group of European countries opening their arms to welcome Islamic finance. They even outweigh some Muslim countries in adopting and implementing Islamic banking structures and operations. The UK, for example, is said to be the eighth-largest global center for Islamic finance in 2007, behind countries such as Saudi Arabia and the majority of the GCC-countries but, surprisingly, ahead of Pakistan, Egypt, Sudan, Bangladesh and Turkey (IFSL, 2010). Moreover, the UK's first stand-alone Islamic commercial bank, the Islamic Bank of Britain (IBB), reported an increase in the number of non-Muslim customers. This was primerly because High Street banks in the UK offer fewer opportunities for house mortgages, particularly during the economic crunch of 2007. Such trends have prompted many to conclude that the Islamic banking provides a viable alternative to conventional banking and is now being treated seriously by regulators (Wilson, 2009).

In practice, the most well-established Islamic finance forms are: Sukuk, funds, banking and Takaful. Products that may be the subject of innovation include private equity, private wealth management, hedge funds and derivatives. By and large, commercial banks account for the bulk of the global Islamic assets with investment banks, sukuk issues, funds and takaful making up the balance (IFSL, 2010).

The Islamic tradable bonds (Sukuk) market has been the most rapidly growing segment of Islamic finance. The global market of these asset-based Islamic investment certificates has increased

[1] Islamic Financial Institutions (IFIs) can be divided into three main types: **I)** institutions whose entire businesses are conducted in compliance with the Islamic law [so-called "fully" (IFIs)], **II**) Islamic window which is best described as segregated division of a conventional financial institution specialising in Shari'ah-compliant products and services, and **III**) Islamic subsidiary of a conventional institution where the operations are completely Islamic and separated from the parent conventional institution. The Islamic product range in the Islamic subsidiary is generally broader than that of an Islamic window. Typically, only Islamic products are provided although a customer relationship may be managed by both conventional and Islamic sides of a bank. Most importantly, capital funding is provided by the parent company on the basis of Shari'ah approved contracts.

more than five-fold from 2004 to 2007 (Jobst, Kunzel, Mills and Amadou, 2008). The market is estimated to be US-$ 70 bn in 2008 and is projected to reach US-$100 bn by 2010 (Zawya, 2007a). According to Morgan Stanley, the value of sukuk is estimated to be US-$ 90bn in 2008, 40% of which are international issues - up from less than US- $1 bn in 2002. Sukuk certificates have been issued internationally by sovereign and corporate entities, particularly from Muslims countries (Fig.2.1). It is reported by Dubai Chamber Economist based on S&Ps (2009) that the majority of the Sukuk issuance has been by governments and related entities (74.6%), followed by corporations (22.6%) and then by financial institutions (2.8%). The maturity profiles (times and periods) of Sukuk are divided in accordance with the issue prospectus (Fig.2.2). Sukuk can be issued on a short-term, medium or long-term. Fig. 2.2 ensures that the appetite for short-term sukuk is much greater than that for the longer tenure.

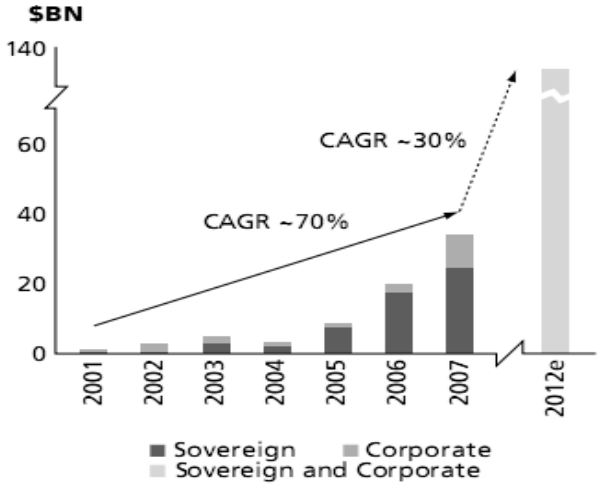


Fig. 2.1: Global Sukuk issuance by type of issuer

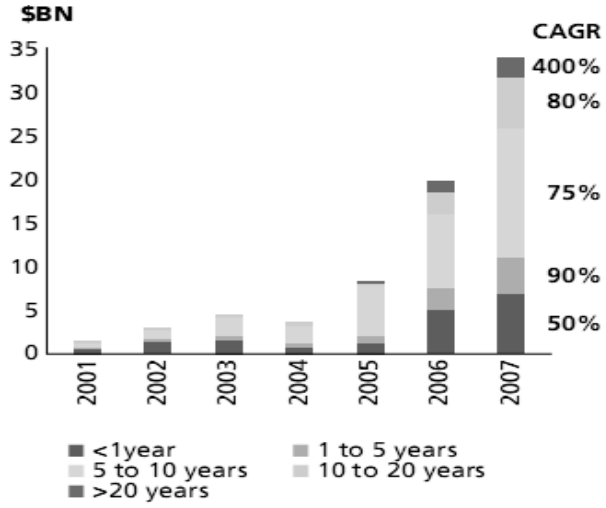


Fig. 2.2: Global Sukuk issuance by type duration

Source: Zawya and Oliver Wyman analysis (2010)

The Bahrain Monetary Agency was among the first central banks to issue Sukuk in 2001. Sukuk has been dominated by Malaysia and the UAE which, for example, issued 55% and 20% of-Sukuk to 2008, respectively (Fig. 2.3). The trend, however, goes global to non-Muslim countries

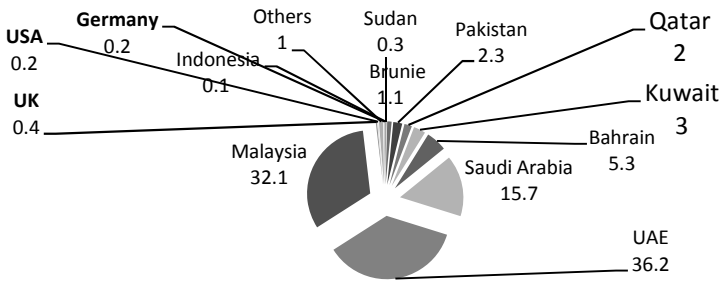


Fig. 2.3: World Sukuk Issuance by Country during 2001-07

Source: DB research based on Zawya (2008)

such as: China, Japan and Thailand (Morgan Stanley, 2008). In Europe, for example, the German State of Saxony-Anhalt became the first non-Muslim issuer to tap the global Islamic debt market in 2004, raising €100 m or so via a Sukuk issue in an innovative effort to appeal to a broader range of investors. Such a trend is, however, due to the fact that an *investor can invest ethically without being a Muslim*.

Overall, Musharaka, Ijara and Murabaha based-Sukuk are clearly the most common and popular Sukuk structures with the condition that at least 51% of the underpinning assets must be leased-back as "*real assets*", not debt instruments (Gulf one Investemnt bank, 2008). More specifically, Ijarah based- sukuk is the most dominant type of Islamic bonds (e.g. over 50% of the global sukuk transactions were based on Ijara mode of financing in 2008), (Fig.2.4 & Fig. 2.5) (Standard & Poor's, 2009). Due to the unprecedented challenges in 2008, lack of standardization and low liquidity, the global Sukuk issuance decreased by relatively 52% compared with 2007 (IFSL, 2009). The Ijarah Sukuk witnessed a moderate decline of 8% due to the global financial crisis. Musharaka and Mudaraba Sukuk also declined by 83% and 68%, respectively. By contrast, Murabaha Sukuk issuance strikingly increased by 60% or so. Overall, the tremendous decrease was witnessed across many of the key issuance markets in Muslim majority countries. For instance, the GCC-States and Malaysia have been the hardest hit, experiencing declines in Sukuk issuance of 55% and 59%, respectively (Moody's Investors Service, 2009).

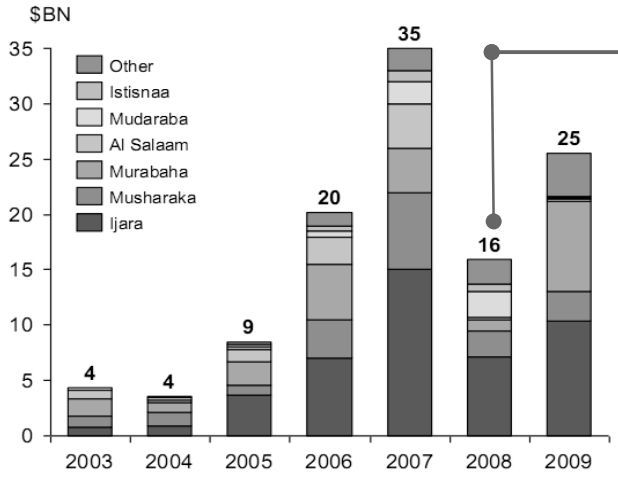


Fig. 2.4: Global Sukuk Market - Issuances (by Structure)
Source: Booz & Company, (2011)

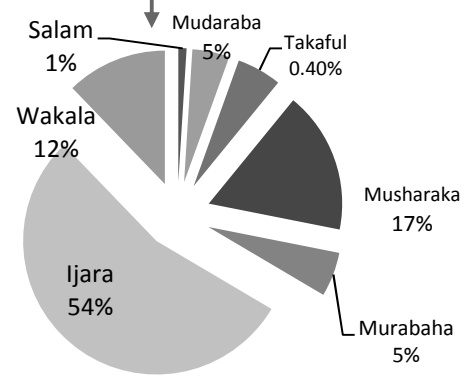


Fig. 2.5: Composition of Global Sukuk, 2008
Source: Gulf one Investment bank based on S&P (2008)

Concerning the Islamic fund market, the total number of Islamic funds has expanded rapidly in recent years (IFSL, 2009). From around 150 funds in 2000, the "Eurekahedge" estimates that the total number of Shari'ah compliant funds during 2008 having risen to approximately 680 (Fig.

2.6). Ernst & Young estimates that the total value of Islamic funds has grown from US-$20bn in 2003 to US-$44bn in 2008. Equity funds account for the largest segment (40% of funds), with fixed income (16%), real estate & private equity (13%), cash, commodities and other funds make up the balance. At the country level, 58% of the funds are invested in a portfolio covering the Middle East and Africa. A further 20% are in a global portfolio, 15% in Asia, 6% in US and the residual 1% elsewhere.

Based on the fund size, Eurekahedge (2008) suggested that "the number of funds provides a more telling statistic (Fig. 2.7), as this is not a bell-shaped curve as might be expected, but one skewed towards smaller-sized funds with a significant tail extending to larger-sized funds". Hence, the bulk of Islamic funds are small scale with 67% being less than USD-$100m and many of these having attracted only USD-$10m to USD-$15m (IFSL, 2010).

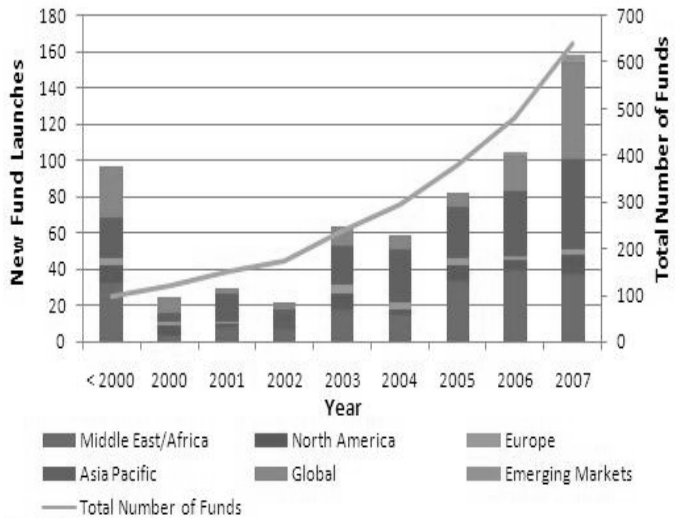


Fig. 2.6: Industry Growth over the Years
Source: Eurekahedge, 2008

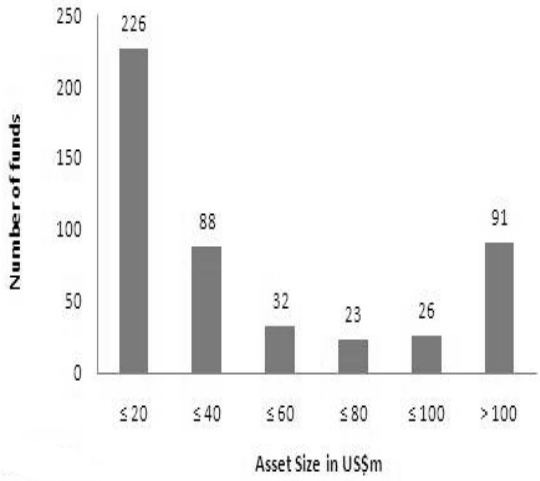


Fig. 2.7: Funds by Assets under management

Within the Islamic investment funds, the equity funds market is one of the largest and fastest-growing sectors. Since the 1990s, Islamic equity funds is said to grow by 12–15% per annum (MONEYworks Guide, 2008). The target markets for Islamic equity funds vary significantly, some, target the Middle East and Gulf regions, while others cater Muslim communities in European markets. As a result of the increasing demand for Islamic equity investment, the International Investor (of Kuwait) in collaboration with FTSE Group, The Independent Global Index Company (based in London), launched the first Islamic equity index series, FTSE Global Islamic Index Series (GIIS) at the end of 1998. Subsequently, in 1999, the first Dow Jones Islamic market index (DJIMI) was launched to track the performance of companies whose activities are

consistent with Islamic principles from 34 countries (Hussein, 2004). This series encompasses today more than 70 indexes and remains the most comprehensive family of Islamic market measures (DowJownes, 2008).

According to the leading fund monitoring company called "*Failaka Advisors*", the AME info reveal in 2008 that there are globally over 300 Islamic equity funds by the end of 2007. Similarly, there are about 200 Shari'ah-compliant mutual funds available in the market, with accumulated assets under management of about US-$ 250-300 bn (Cihak, Martin and Hesse, 2008). Despite the considerable growth in Islamic equity funds they, however, remain in their infancy and play a limited role in Islamic financial markets. As a result of the lack of interest and poor distribution, some of funds have closed down. For example, the Global Equity 2000 Sub-Fund and Ibn Majid Emerging Markets were closed and their assets were liquidated in 2002 (Smyth, 2006). Islamic equity funds also suffered from the adverse market conditions and thus, 6%, 24% and 93% of the launched funds in 2007, 2008 and 2009 have respectively liquidated (Fig. 2.8).

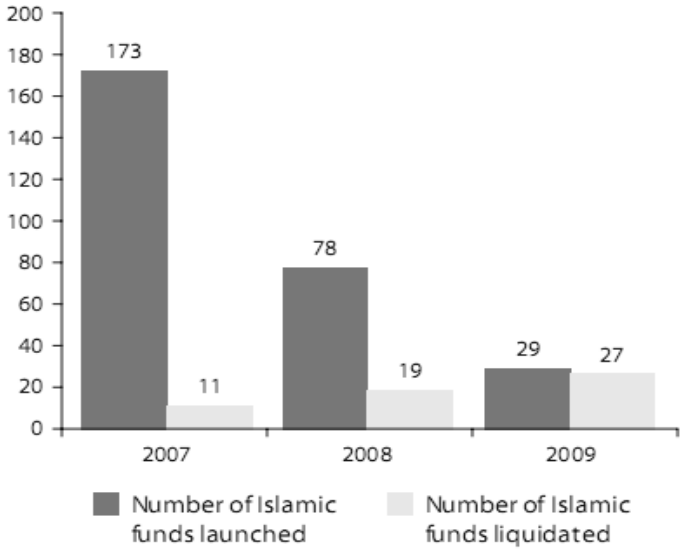


Fig. 2.8: Global Islamic funds – launched and liquidated
Source: The gulf, business news and analysis, (2010)

In terms of the Islamic financial assets, Banker's survey of the top 500 Islamic Financial Institutions (IFIs) shows that the global total of Islamic assets grew by 29.7% over 2006 to reach US-$ 500,482 m in 2007.[2] The IFSL based on the Banker and Ernst and Young (E&Y) revealed in February 2010 that the Islamic financial services global market, as measured by Islamic assets, is estimated to have reached US-$ 951 bn at end-2008, 25% up from $785 bn in 2006 and 73% up

[2] "Although this is relatively small compared with the US-$74,232.2 bn in total assets amassed by the Top 1000 World Banks in The Banker's latest global listing, the massive growth taking place in Islamic institutions is unassailable and can be expected to accelerate" (The banker, 2007).

on the 2006 total. Oliver Wyman (2009) estimates that by 2012, Islamic assets will reach almost $1,600 bn. According to the Euromoney Islamic Finance Review for 2007/08, IFIs have risen from one institution in one country in 1975 to more than 300 institutions operating in more than 75 countries in 2008. While Islamic banking assets were calculated at US-$ 750 bn worldwide in 2007 and the forecasts indicate that this number will reach US-$ 1,000 bn by 2010. The International Monetary Fund (IMF) puts the total assets of Islamic banking expected to reach US-$1tr by 2016 (Blominvest, 2009). [3] However, from 2007 to 2010, while the global banking assets are expected to grow annually at 5%, Islamic banking is expected to grow at 22% (Fig. 2.9 and Fig. 2.10) (Booz & Company, 2011). Oliver's surveys (2009) suggest that half of the 1.4 bn Muslims worldwide would opt for Islamic finance which will dramatically increase the global Islamic assets and their returns on turn. This could be happened if given a competitive from numerous new entrants has not dented economic returns as revenue growth has been running ahead of asset growth with a CAGR of 44% over the past five years (Fig. 2.11).

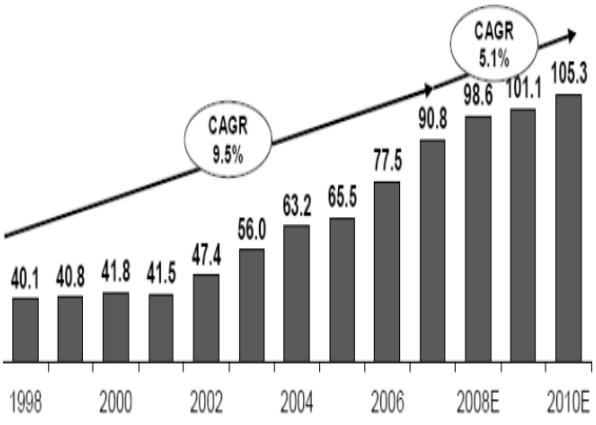


Fig. 2.9: Worldwide banking assets, USD tr
Source: Booz & Company, (2011)

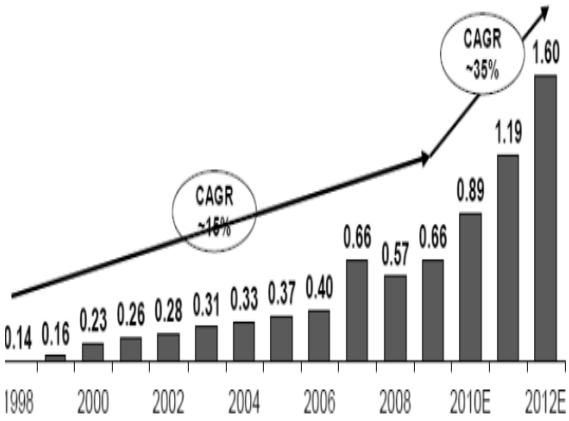


Fig. 2.10: Worldwide Islamic banking assets, USD tr.

As mentioned earlier in this chapter, Islamic commercial banks accounted for the majority of Islamic assets (74% of total assets). Investment banks and Sukuk issues are making up most of the remainder. Funds and Takaful sectors are made a contribution (Fig.2.12). However, "Islamic retail banking is also a very attractive market given its strong growth and long term market potential. Islamic retail banking assets and revenues have been growing at over 25% per year since 2003 (Fig. 2.13). The market is set to expand further since nearly 50% of Muslims would choose

[3] Since the first experience of Islamic banking seems to have been in the Middle East in the 1960s it is, therefore, a relatively novel industry and no body really can estimate the exact size in modern times. Estimates of the size of Shari'ah-compliant assets and the number of Islamic financial institutions vary considerably. For example, Mckinsey & Co. estimates that the global Islamic finance assets could reach USD-$1 tr by 2010 whilst Moody's predicts that it could reached USD-$ 4 tr in 2015. Furthermore, while IMF estimates that the number of IFIs has risen to more than 300 institutions in 2008, the Association of Islamic Banking Institutions Malaysia (AIBIM) estimated that there are around 486 financial institutions around the world offering Islamic products.

Islamic retail banking if given a competitive and high-quality alternative to conventional banking. This is underpinned by the strong demographics of major Muslim countries. By 2020, the population of the top 10 Muslim countries will grow by nearly 200 MM, with over half of the population still under age 25. As this new generation enters adulthood, the retail customer base is set to double in the same period" (Oliver Wyman, 2009).

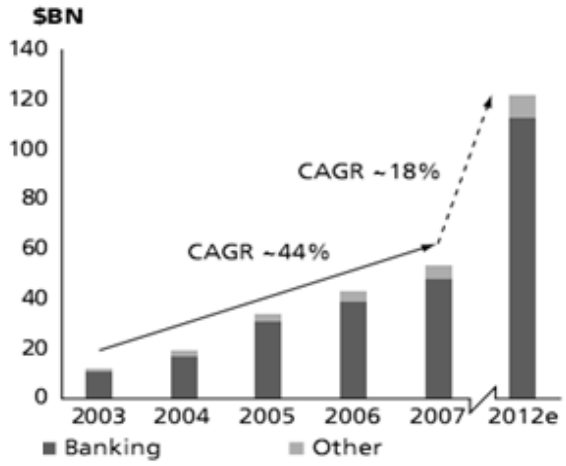


Fig. 2.11: Islamic finance-Revenues 2003-2012
Source: Oliver Wyman analysis based on Bankscope, 2009

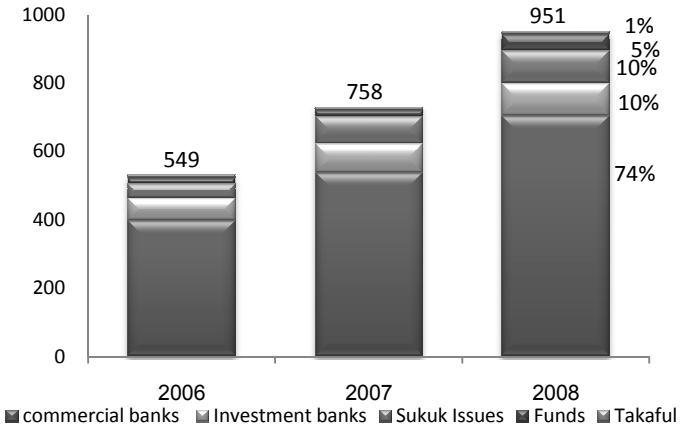


Fig. 2.12: Global assets of Islamic finance- $bn
Source: IFSL, (2010)

The Wholesale banking segment is clearly considered to be one of the biggest markets for Islamic finance with over $420 bn and $28 bn of assets and revenues, respectively. Wholesale assets have been growing at 34% per annum since 2003 (Fig. 2.14) and is estimated to reach $1 tr by 2012 with revenues of more than $60 bn (Oliver W., 2009). Overall, the number of Islamic banks (Commercial, Wholesale and Retail) is increasing greatly around the world, with the con-

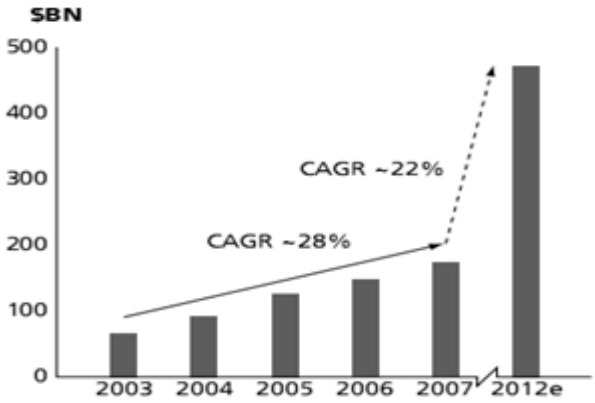


Fig. 2.13: Islamic retail banking-Assets
Source: Oliver Wyman, (2009)

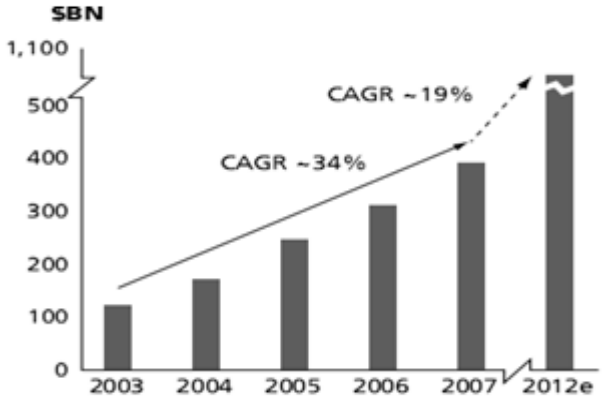


Fig. 2.14: Islamic wholesale banking-Assets

centration in Muslim countries (Fig. 2.15 and Fig. 2.16). Surprisingly, the rate of increase during the global financial crisis reached some 28%. The assets of the 700 Islamic banks went up to

$822 bn in 2009 from $650bn in 2008 and are expected to rise to $1.3 tr in 2010 (Emirates Business, 2009).

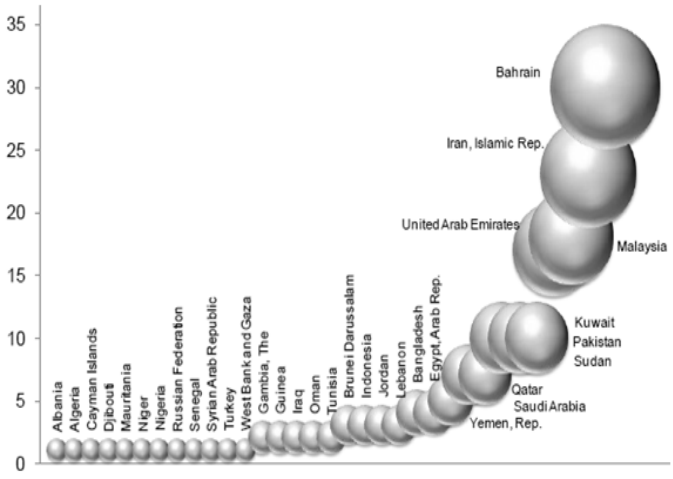


Fig. 2.15: Number of Islamic banks in selected countries
Source: Bankscope, (2009)

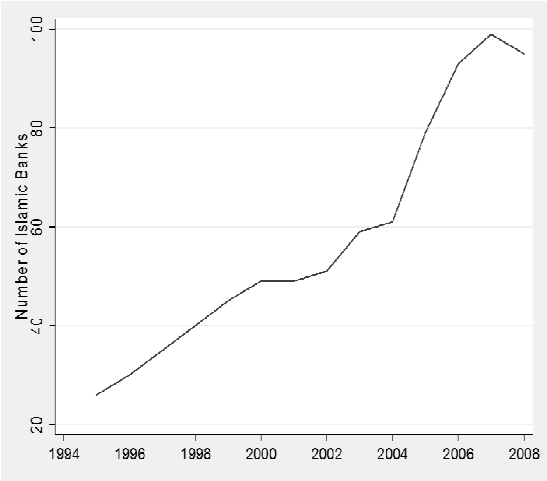


Fig. 2.16: Number of Islamic banks reporting to Bankscope (1995-2008).
Source: Beck et al (2010)

Broadly speaking, the Islamic finance market is most developed in Iran, Malaysia and the majority of GCC-countries (Table 2.1 & Fig. 2.17). The GCC-institutions provide the largest chunk of the world's total Islamic assets 70.9% (80% based on O. Wyman (2009)) and expanded the most of it's overall growth by 39.4% to reach US-$ 178.1 bn. According to US-based firm Morgan Stanley as on Feb. 2008, Islamic finance assets will grow at a rate of between 20% to 25% in the Gulf by 2010, as their global worth ascend to about US-$ 1.4 tr while the non-GCC MENA

Table 2.1

Islamic finance by country: Banking, takaful and fund assets-$bn

	Total 2007	Total 2008	Banks	Takaful	Others	*Number of firms*
Iran	**235.3**	**293.2**	290.6	2.6	---	*23*
S.Arabia	**92.0**	**127.9**	127.1	0.8	---	*20*
Malaysia	**67.1**	**86.5**	84.4	2.1	---	*37*
UAE	**49.1**	**84.0**	83.0	1.0	---	*18*
Kuwait	**63.1**	**67.6**	57.4	0.2	10.0	*30*
Bahrain	**37.4**	**46.2**	44.2	0.4	1.6	*34*
Qatar	**21.0**	**27.5**	25.3	0.4	1.8	*16*
UK	**18.1**	**19.4**	19.4	---	---	*6*
Turkey	**15.8**	**17.8**	17.8	---	---	*4*
Bangladesh	**5.7**	**7.5**	7.5	---	---	*15*
Sudan	**5.3**	**7.2**	7.0	0.2	---	*22*
Egypt	**5.7**	**6.3**	6.3	---	---	*3*
Pakistan	**6.3**	**5.1**	5.1	---	---	*18*
Jordan	**3.3**	**4.6**	4.5	---	0.1	*6*
Syria	**0.6**	**3.8**	3.8	---	---	*2*
Iraq	**---**	**3.8**	3.8	---	---	*1*
Indonesia	**3.4**	**3.4**	3.2	0.2	---	*20*
Brunei	**2.7**	**3.2**	3.2	---	---	*1*
Others	**7.2**	**7.1**	6.5	0.4	0.2	*26*
Total	**639.1**	**822.1**	800.1	8.3	13.7	*302*

Source: IFSL (2010) based on "The Banker"

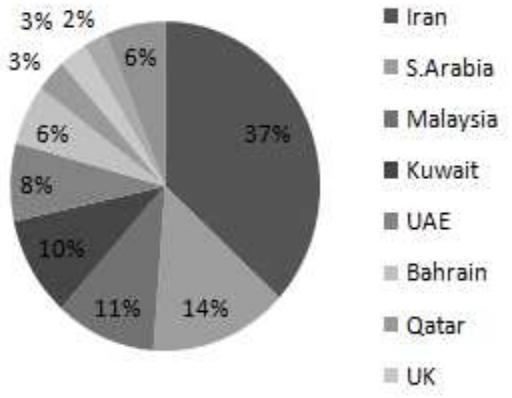


Fig. 2.17: Geographic breakdown of Islamic finance, banking, takaful & fund assets, end-2007, US-$bn
Source: IFSL Research, February (2010)

institutions grew by 29.9% to reach US-$ 176.8 bn. Asia, led by Malaysia, Brunei and Pakistan, is the third largest region in the world for Islamic assets, growing by 20.9% to US-$ 119.3 bn. Such a growth is driven largly by the the wide acceptance of Islamic banking products. For example, 20% of the banking clients in the Gulf and Muslim Asia who would spontaneously choose an Islamic financial product over a conventional one with a similar risk-return profile (S&P Ratings Services, 2008).

Despite the fact that the Islamic Republic of Iran has the largest quotient of the global Islamic banking and finance (accounting for 35.6% of the global Shari'ah-compliant assets[4] (Table 2.1)), it cannot be recognized as a proper example of how to develop and improve Islamic finance operations. This is due to the fact that the clients in Iran have no choice but to use the Islamic system because the whole banking system has been Shari'ah-compliant due to the law on interest free banking that was passed in 1983. Furthermore, Islamic banks are state-owned and have little autonomy, even in determining what deposit and financing products to offer. Let alone the fact that banks in Iran do not have Shari'ah committees which is considered as one of the main requirements to establish any Islamic bank (Wilson, 2007a).[5]

Banking penetration is relatively low in Africa. According to the Moody's special report in 2008, Africa has witnessed a modest growth in Islamic finance practices. Recently, around 37 IFIs operate in Africa to serve the Muslim population of "412" m inhabitants, the second largest Muslim population in the world. Assuming that banking entrenchment in Africa represents an average 50% of its total GDP-per capita, the Islamic finance market on the continent is potentially worth relatively US-$ 235 bn. As of year-end 2007, the actual depth of Shari'ah-compliant financial intermediation in Africa was US-$ 18 bn, equating to a market share of less than 8%. The industry however, is now highly concentrated of its development in some African countries. Specifically, more than 50% of African's assets are located in Sudan, with Egypt ranking second with a much lower share of around 20%. Taking into consideration that the continent continues to economically grow at its current pace incremental wealth creation will make it easier for the

[4] "According to statistics from Asian Banker Research, the consultancy division of "The Asian Banker", the 100 largest Islamic bank's assets grew to UD-$580 bn in 2008, up from US-$350 bn in the previous year (a 66% rise). Compared to 2008, the identities of the largest banks remained fairly constant, with Bank Melli of Iran at the top of the list and Al-Rajhi Bank, headquartered in Saudi Arabia, in second place. Indeed, seven out of the top 10 institutions are Iranian, and the 12 Iranian banks in the list account for 40% of the top 100 bank's assets. Four other countries, Malaysia, UAE, Saudi Arabia and Kuwait, accounted for most of the rest of the wealth of the top 100 banks. While Iranian banks are often very large by assets, they are not necessarily the most profitable. Al-Rajhi Bank had the highest net income at US-$1.74 bn, with the next highest, Kuwait Finance House, just under US-$1 bn" (NewHorizon, 2009).

[5] "Islamic banking and finance is about extending choices, not restricting alternatives". Shari'ah compliance is not a matter of national law because each institution has its own Shari'ah board. Hence, each Shari'ah board passes its own religious rulings, which extends choices in the marketplace for religious thoughts as well (Wilson, 2007).

Islamic financial services sector, including Islamic commercial banking, Takaful, investment and microfinance, to develop. In practice, Islamic banks in the North African countries were less affected by the global crisis of 2007 partly due to their limited reliance on international funding and thus, have a significant room for growth in penetration in the coming years (IFSL, 2010).

Recently, the investments through Islamic finance systems are acceptable in a significant number of Muslim and non-Muslim countries around the world such as: Jordan, Lebanon, Syria, Egypt, Morocco, Algeria, Tunisia, Indonesia, Turkey, Japan, China, Kazakhstan, US, France, Germany, the UK, Italy, Switzerland, Luxemburg, Bosnia and Herzegovina, Australia, Spain, Irlandand US. Recognizing the importance of Islamic finance, Islamic banks are expanding their network globally. Conventional banks in Muslim countries along with global conventional banking majors are also now offering Islamic products and services, either through Islamic windows or through newly established Islamic entities. This led, however, to a tremendous growth of Islamic capital market products and services, institutions and banking clients. Since the beginning of 2006, "The Banker" has listed (78) new large pure-play IFIs formed or under formation, 60% of which are Gulf-based.

2.3. Demand for Islamic financial products in Europe

The momentum of Islamic finance originates, long time ago, in Muslim countries not in the Muslim communities in Europe. Recently, Islamic banks not confined to just Muslim-majority countries but spread all over Europe. Islamic banks in Europe, mainly established in the UK, were initiated and/or sponsored by investors from Muslim countries in the Middle East. The factors affecting the advancements of Islamic banking in Europe are diverse. One of the main drivers for the rapid growth in Islamic finance is an increasing Muslim population. "During 2002-2006, the Muslim population worldwide grew at an average of 1.9%, higher than the world's population growth rate of 1.2%" (Blominvest, 2009). As at the end of 2009, Pew Research Center estimates that the global Muslim population stood at 1.6 bn. It is, however, expected that the Muslim population will account for 30% of the world's total by 2025 (Blominvest, 2009). Western debt crisis spurs also the global growth of Islamic finance. The European banks, which suffer from the credit crunch of 2007, have to investigate on new possibilities to raise funds. Given the excess liquidity in the oil-exporting countries, it becomes reasonable to offer Shari'ah compliant investment facilities to attract the foreign investors. By and large, Islamic banking products and

services are attractive to non-Muslims due to the certainty of repayments, ethical principles and also due to the appeal of the PLS.

Overall, Islamic finance has existed internationally and has witnessed significant growth in the last decades. While the UK has been the first mover in facilitating Islamic banking and finance, Europe with its much larger Muslim population has greater potential for Islamic finance. Next section discusses the European experience in Islamic banking and finance (the UK, Germany, France and Turkey, in particular). It further explains shortly the success requirements for the European countries and the world to appeal the Islamic investments from around the Islamic countries. Table 2.3 in the appendix addresses also the emergence and the growth potential of Islamic banking and finance in the rest of the world.

2.3.1 Islamic banking and finance in the UK

The UK has the highest Islamic assets of all Western countries. Islamic finance sector in the UK developed recently in regional hubs which are not restricted to London but further have seen in other UKs states (IFSL, 2008). Prior to 2003, the only Islamic banking products available in the UK were offered either by the UK-based branches of Middle Eastern banks such as the National Bank of Kuwait (NBK) or by relatively small institutions such as the West Bromwich Building Society. In 2003, HSBC launched its Amanah current account and home finance products, becoming the first Islamic financial solutions provider arm of HSBC. Lloyds TSB has also launched a range of Islamic retail banking products including primarily current accounts and home finance. Nowadays, London has become one of the biggest centers for Islamic banking and finance in Europe. According to the Enterprise Ireland (2010), the UK now accounts for just fewer than 2.5% of global Islamic assets and has five fully fledge Islamic banks and many *Islamic Windows* offering Islamic financial products and services.

It is no surprise that part of the Islamic finance growth has taken place in the UK given its position as one of the leading international financial centers. Most of the recent developments and growth of Islamic finance in the UK refer mainly to the Government support, to give the UK's large Muslim community the access to financial services consistent with their religious beliefs, and the favorable regulatory environment which are encouraging Islamic banks to set up operations (UK Trade & investment, 2007).

There are several reasons that have made the UK attractive to both conventional and Islamic financial institutions: **I**) the sounder and flexible framework for companies to work in the UK (Global Market Briefings (GMB), 2008); **II**) the few regulatory bodies with the (FSA) as the main one; **III**) it is easy to set up a business in the UK, just 13 days compared with a European average of 32 days (UK Trade & investment, 2007); **V**) the increasing number of Muslims plays rather an important role to increase the need for Islamic finance. The data collected from the Office for National Statistics (ONS), Labor Force Survey (LFS) reveals that, in the UK, the Muslim population has grown by more than 500,000 to 2.422 million in just 4 years (2004 – 2008), and is multiplied 10 times faster than the rest of society.

As a consequence of considering the UK as the key Western hub for Islamic banking and finance, an important feature of the developments has taken places. According to Wilson (1994), in 1982, the first Islamic bank was established in London when the Al Baraka Investment Company acquired "Hargrave Securities", a licensed deposit taker in the UK, and converted it into an Islamic bank. Until 1993, it operated as a retail bank offering current accounts, chequeing facilities, investment deposits and house financing. Products and services were predominantly targeted at Arab visitors to London and high net worth individuals from the Gulf. Due to lacking critical mass and a change in British banking law, Al Baraka Bank re-incorporated in 1993 as Investment Company, gave up its banking license and closed its three branches. It is now operating two subsidiaries, being the "Al Baraka Investment Company" dealing with short term financing and the "Dallah Al Baraka Investment Company" concerned with long term financing (Khan and Porzio, 2010). In 1988, the first Islamic mortgages were offered by Al Baraka bank for properties in London, with mortgages structured through an Ijara rental contract, whereby the bank purchases the property and the client repaid by monthly installments and paying rent to the bank (Wilson, 2007b).

According to the IFSL (2009/10), different set of aspects of Islamic finance were established recently in the UK: **I**) Five fully fledged Islamic banks were authorized: **1)** The Islamic Bank of Britain (IBB), the first FSA approved Islamic bank. IBB commenced banking operations and launched on the London Stock Exchange (LSE) - AIM market - on Oct. 2004. It became the first stand-alone commercial Islamic bank in the country with over 50, 531 customers as of 2010. Qatar International Islamic Bank (QIIB), Qatar Islamic Insurance Company (QIIC), Her Sheikh Hamad Bin Khalifa Bin Hamad Al Thani and Her Sheikh Thani Bin Abdulla Bin Thani Al Thani hold approximately 60% of the bank's shares. **2**) The European Islamic Investment Bank (EIIB),

the first FSA approved Islamic investment bank. EIIB was incorporated in UK in January 2005. It received authorization by the FSA in Mar. 2006. In April 2006, EIIB opened for business. In May 2006, the bank completed its IPO and was admitted to London's AIM market. In Nov. 2006, EIIB opened a representative office in Bahrain. EIIB aims to deliver a full choice of alternative investment opportunities, enabling Islamic investors to construct balanced and sophisticated portfolios which can access a full range of asset classes internationally. **3**) The Bank of London and the Middle East (BLME). It was opened in 2007 to offer Shari'ah compliant investment and corporate banking to businesses and high net worth individuals globally. Boubyan bank (the Kuwait based bank) holds 14.97% of the bank's shares in 2008, while Boubyan Capital holds only 0.50%. **4)** The European Finance House (EFH), a unit of Qatar Islamic Bank (QIB), received a banking licensed in 2008. It offers a balanced range of Shari'ah compliant investment products and services to clients that include companies and wealthy investors. **5**) Gatehouse Bank which received the license in 2008. It is a wholly-owned subsidiary of "The Securities House K.S.C.C", one of the leading, investment companies in Kuwait, which operates throughout the Gulf region, as well as in Europe and US. The bank is a wholesale investment bank operating in capital markets, wealth management, treasury business and advisory services.

II) There are an estimated 17 conventional banks that have set up windows in the UK to provide Islamic financial services. These banks are: Ahli United Bank (Manzil Home Purchase Plans), Alburaq (the brand name for Islamic financial services that evolved from the Arab Banking Corporation (ABC), through its London subsidiary ABC. International Bank plc (ABCIB), Bank of Ireland, Barclays (Barclays capital partnering Dubai Islamic Bank (DIB) for one of the largest Sukuk issuance i.e. PCFC)[6], BNP Paribas, Bristol and West, Citi Group, DB, Europe Arab Bank plc, HSBC Amanah, IBJ International London, J Aron and Co., Lloyds Banking Group, RBS, Standard Chartered, UBS and UNB. **III**) Twenty Sukuk issues raising US-$ 11 bn listed on LSE, exceeded only by Dubai Nasdaq. **IV**) The first company to offer Takaful to the UK residents known as "Principle Insurance Holdings Limited "was authorized in 2008. The shareh- olders are institutional and private investors predominantly from GCC countries, including Saudi Arabia (KSA), Bahrain, Kuwait, the UAE and Malaysia. **V**) The presence of twenty law firms supplying services in Islamic finance such as; Allen & Overy LLP, Eversheds LLP and King & Spalding International LLP. **VI**) The existence of fifty-five institutions offering educational and training products in Islamic finance, more than that provided in any other country worldwide.

[6] The PCFC Sukuk, issued on January 2006, is the largest and the first convertible Sukuk issue. It is convertible to 30% equity shares of the PCFC entities when they go for the Initial Public Offering (IPO). The Dubai Ports, Customs & Free Zone Corporation (PCFC) has launched a US-$3,500 m, two-year Musharaka Sukuk, increased in size from US-$2,800 m after orders were received in excess of US-$11,400 m. Barclays Capital and Dubai Islamic Bank were the lead managers of the issuance (Zawya, 2007b).

According to the IFSL survey (2010), the total assets for the full fledged Islamic banks and the HSBC Amanah Finance window in the UK reached approximately at the end of June 2009 to US-$19,411 bn (Table 2.2). Moreover, the UK set a precedent by issuing the world's first Shari'ah compliant Exchange-Traded funds (ETFs), getting better of Malaysia which holds a series of "firsts" in the Shari'ah compliant finance market (Aziz, 2008). However, the evolution of Islamic banks in UK has faced many obstacles which considered being a key aspect of supportive government policy that has been establishment since 2003. These obstacles fall into the following categories: **I**) the previous tax law provisions, when applied to Islamic finance transactions, lead to a double taxation of Murabaha transactions mainly because it involves two sales where a financial institution buys a property and then re-sells it to the individual. In response to this dilemma, the first tax legislation catering specifically for Islamic finance arrangements came in Finance Act 2003, in the area of stamp duty land tax (SDLT). It catered for individuals using alternative property financing arrangements (covering Islamic mortgages), removing the double charge to SDLT (Ainley, Mashayekhi, Hicks, Rahman and Ravalia, 2007). **II**) Previously, if a sukuk was issued, the basic problem was that tax costs arose in the issuing SPV company returns. Reforms were made to the arrangements for issues of Islamic bonds, so that returns and income payments can be treated *'as if'* interest. This, however, makes UK a more attractive location for issuing and trading sukuk (HM Treasury, 2008; UK Trade & investment, 2007).

Table 2.2

Shari'ah compliant assets in the UK, **$ m**

The Bank	Year-End	2006-07	2007-08	2008-09	% change
HSBC Amanah Finance	Jun-09	13960	15194	16537	**9**
Bank of London and the Middle East	Jun-09	1279	1196	1119	**-6**
HSBC	Jun-09	---	570	698	**22**
European Islamic Investment Bank	Jun-09	757	648	555	**-14**
Islamic Bank of Britain	Jun-09	289	337	394	**17**
European Finance House	Jun-09	---	94	n.a.	**---**
Gatehouse Bank	Dec-08	---	15	108	**610**
Total		**16285**	**18055**	**19411**	**8**

Source: IFSL (2010) estimates based on the Banker.

III) The unconditional obligation on part of the bank to repay the amount received (money placed on deposit must be capital certain). Deposit is defined under Article 5(2) of the Financial Services and Markets Act 2000 (Regulated Activities) Order 2001 as: "a sum of money paid on terms under which it will be repaid, with or without interest or a premium, and either on demand or at a time or in circumstances agreed by or on behalf of the person making the payment and the person receiving it…" (Ainley et al, 2007). This, however, cannot normally happen under Islamic banking principles. Islamic banks cannot just take funds from customers, guarantee the return

of the capital sum and pay them profit. That would be like paying them interest on borrowed funds which is strongly prohibited. Islamic banks normally raise funds on a PLS arrangement through Mudaraba accounts. Under Islamic principles, the bank cannot therefore guarantee the repayment of the full amount of the deposit, and that the bank customers could lose part or whole of their deposits. This main principle did not meet the requirements of the UK regulations that deposits had to be returned in full (Mounira and Anas, 2008).

The solution for the above mentioned obstacle was to structure a "Mudaraba arrangement" in such a manner that the risk of loss of the amount deposited by the customers was very low and that the Islamic finance depositors' are entitled to the same degree of protection as depositors at traditional banks. To do so, the Islamic bank should set aside reserves earned from the investment of funds in a "special reserve account" before distribution of profits between the bank and its customers. This reserve is to be used primerly to cover any losses that arose from the investments and to "top up" any shortfall in the amount of profits payable to the banks customers as well. In fact, however, most regulatory agencies have made it "compulsory" for Islamic banks, either in Islamic banks or in Europe, to be coverd under deposits insurance schemes (Mohd-karim, 2010).

2.3.2 Islamic banking products in France

Despite France has the biggest Islamic community in the West, authorities have been not flexible enough to introduce changes in the regulatory framework to accommodate Islamic financial products. Given the possible market potential and the strong interest for Islamic finance in France with nearly two-thirds of French Muslims declaring a willingness to change to a Shari'ah-compliant bank (Fig.2.18), Paris"*aims at competing with London as European hub for Islamic finance*" (Moody's Investors service, 2008) by establishing an Islamic financial services sector. In 2007, France announced reforms to adapt its banking legislation to allow more banks to engage in Islamic finance (WSBI/ESBG, 2009). In May 2008, France's Upper House of Parliament hosted roundtable discussions with politicians, bankers and Shari'ah scholars to discuss how to support Islamic finance by raising awareness and changing the legal and fiscal framework (Ramadier, 2008). In July 2008, the Financial Markets Authority (AMF) requested the Paris Europlace to establish a working group composed of representatives of the financial industry to give market participants a clear picture of the legal and transparency requirements for listing Sukuk in France (Gordon, 2008). The findings of the report known as "the Jouini-Pastre report"

concluded that France provides a welcoming environment for Islamic finance subject to certain legal and tax adjustments. Hence, France could be among the world leaders in providing Islamic

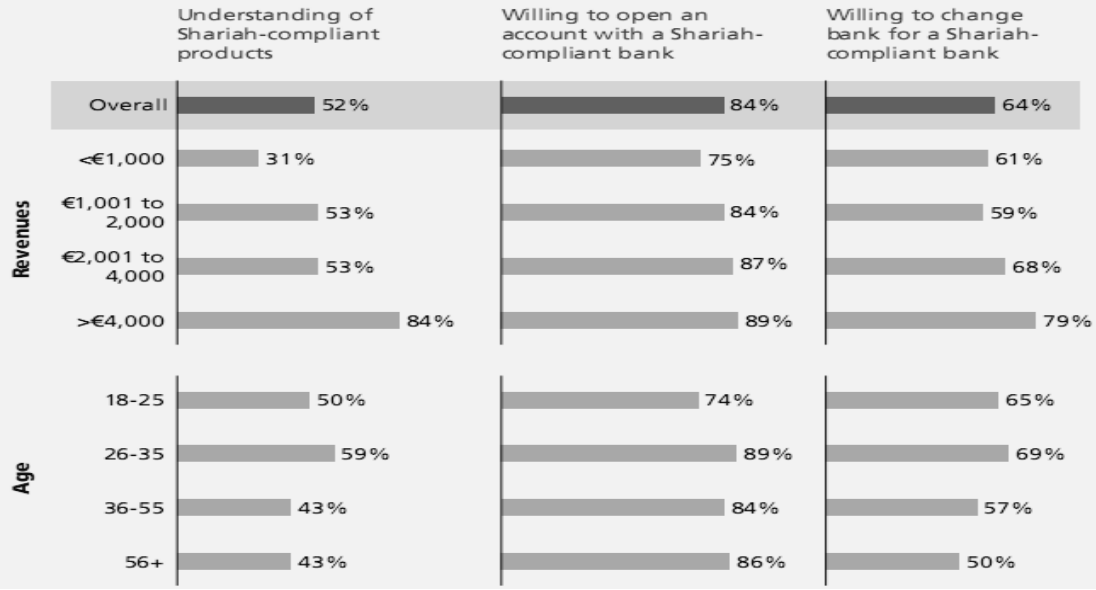


Fig. 2.18: French Muslim interest in Islamic finance
Source: Market interviews, Oliver Wyman analysis (2009).

financial products if the country made a small number of legal reforms. To this end, it would be necessary to attract an important amount of capital to the Paris Europlace. The report estimates that this sum should be around €100 bn (Paris Europlace, 2008).

As stated by WSBI/ESBG (2009), the chairman of the Paris Europlace Islamic Finance Committee, Gilles Saint Marc, presented to the Senate on May (2008) a study on the compatibility between Islamic finance and the French law. The study states that Islamic finance represents an opportunity for France. It is therefore necessary to make some reforms specifically, the enactment of a law modifying the French Monetary and Financial Code and the enactment of appropriate tax instruction. The study further indicates that Islamic finance will bring the following advantages to the French financial system: **I**) Access to new liquidity, **II**) positive external factors such as the integration of Muslims in France, and **III**) proof of the modernity of French law and its capacity for adaptation. Accordingly, in 2009, the French Parliament has passed a law which will facilitate the issuance of Sukuk to make France ready to take Islamic finance a step further (Lush, 2009). Based on that, a set of measures were adopted related to the conditions for issuing Sukuk in the French securities market i.e., the elimination of double taxation on registration rights in Murabaha contracts and the implementation of the tax deduction on capital earned from Sukuk (WSBI/ESBG, 2009).

French banking sector show also a considerable engagement in Islamic finance operations. For instance, "BNP Paribas" stated in their website that it was among the leading banks in recognizing the importance of Islamic banking since the early 1980s. It established "*BNP Paribas Najmah*" in 2003 in Bahrain as a global entity in order to provide Islamic solutions. The bank launched the first Islamic fund under French law in 2007, called “Easy ETF DJ Islamic Market Titans 100” that was capitalized with $20 m in July 2008. Similarly, the Alternative Investment Team of the Société Générale Asset Management (SGAM) has launched a Murabaha fund called “SGAM AI Shari’ah Liquidité” early in 2008 and a series of Shari’ah compliant index funds linked to the S&P’s Shari’ah indices. By and large, it seems that the french government have showed a significant interest to attract some of the Gulf-based Islamic investments which is currently flowing to London offering it a more accommodating legal and fiscal framework in France. Consequently, the first Islamic commercial bank namely "*Tyseer Bank*" was authorized and it is, so far, under foundation (The Banker, 2007).

2.3.3. Islamic finance gaining ground in Germany

Many economists believe that the Islamic banking has a huge potential for active role in the German financial market. Thus, a major feasible demand and a large growth prospects is attributed to the German market for Islamic financial products and services. This is mainly because of the large Muslim population of roughly 3.3 million in Germany (Morag, 2011), with the majority of them being Turkish.

In practice, the “TNS Emnid” polling institute issued in 2000 a research study entitled “*German Banks and Insurances from a Turkish point of view*". This study showed, in contrast to the beliefs of many analysts, that the majority of the Turkish population in Germany accepts non-Islamic financing modes. High percentage of German Turks having interest paying savings books and thus, it does not seem to be an evident religious conflict of accepting "riba". However, at the time of this study, Islamic banking and financial products and services are not offered in Germany and thus, the validity of the results is questionable. Furthermore, the study faced plenty of difficulties, particularly in the form of language barriers and cultural background, which makes the quality of information that is filtered out of the survey rather low (Burghardt and Fuss, 2004). Concerning the sample that was chosen in this study, it can be seen that it represents only 0.03% of the total number of Muslims in Germany and thus, is not fairly enough or representative.

In addition to the previous study, another survey has been conducted by Burghardt and Fuss in 2004. In their study, the authors used interviews with bankers to analyze the German and the UK markets for Islamic products and services from both a supply and a demand perspective. They argue that the Islamic population in Germany mainly stems from secularized Muslim countries where the influence of religion on banking and finance law is low. They, therefore, do not identify any particular need for German Muslims to actively demand Islamic banking credit products in Germany and hence the German market does not seem, in their opinion, to display a sufficient demand for a large-scale integration of Islamic banking products. As a result, the offering of such products are very limited in their availability and variety. In our opinion, the survey concentrated on banks that are most likely to offer Islamic products, have originally based in a country with a high Muslim population, and have a branch in Germany which consequently reduces, without doubt, the volume of data that can be used in the analysis. Moreover, the survey concentrates mainly on people with Turkish background although Muslims of different national origin should not be ignored as they still constitute a significant group of the total number of Muslims in Germany. Eventually, the branches were contacted by telephone, and were only asked if they currently offer Islamic banking credit products in Germany, which may lead to misleading results. Consequently, due to these shortcomings, the accuracy, validity and certainty of the results revealed by the study are rather doubtful and questionable as well.

In practice, according to Gassner (2003 and 2004), there are more than 600,000 Muslim households in Germany. All households have €15 to 25 bn assets deposited with German banks. Gassner argues that the Muslim households have double the savings rate of German households which assigns them promising banking potential that is underexploited at the moment. This is mainly due to the fact that the variety of conventional banking services is not used by German Muslims. Given the annual household income of €13 bn, an annual demand of €2.7 bn for financial services in Muslim households can be derived (Colditz, 2009). This invitabily indicates a large potential market for Islamic financial products and services in Germany.

Recently, "according to a survey conducted in 2010, 72% of Muslims living in Germany are interested in Islamic finance products. If offered by a German bank, 60% of the respondents consider an investment. An outstanding 94% of them declared interest if the services were offered by an Islamic bank. The strongest interest is shown in mortgages 62%, insurance 43% and funds 42%. Additionally, business consultancy recently has estimated the German market potential for Islamic banking products to amount to 1.2 bn Euros" (Dubai Exports and AHK, 2011).

Germany, however, made history in July 2004 when the federal state of Saxony-Anhalt issued the first Islamic bonds in Europe which raised €100 m. The Sukuk is for five years with a floating return based on the Euro Interbank Offered Rate (Euribor) plus one percent (Wilson, 2007b). It was listed in Luxembourg with 40% of the issue, the other 60% of the issue sold to GCC investors in Bahrain. Citigroup Global Markets was the arranger for the Sukuk. The Shari'ah advisory board of CITI Islamic investment bank in Bahrain vetted the legal documentation for Islamic law compliance. The state of Saxony –Anhalt acts as Guarantor while the Kuwait Finance House acts as lead manager for the issue. The Sukuk was rated as –AA by S&P and –AAA by Fitch (The Banker Middle East, 2005). However, Sukuk have to be asset backed and hence, under German law, a "Dutch" foundation, which corresponded to the classical Islamic concept of a Waqf, was established. The ministry of finance then transferred usufruct rights to its building to the foundation, which served as the underlying asset (Gassner, 2004). The structure of Sukuk is a sale and lease back (*ijara*) arrangement, with the foundation serving as a special purpose vehicle (SPV) which is wound up on the termination of Sukuk, when the usufruct rights revert back to the Ministry of Finance which no longer pays rent to service the investors (El-Gamal, 2006).

Albeit in overseas markets, German banks are already well involved in the Islamic banking sector. For example, Commerzbank structured "*Al-Sukoor*" European Equity Fund in 2000 on behalf of "*Al-Tawfeek*" company for investments, the part of Jeddah-based Dallah Albaraka Group which was largely aimed at Turkish expatriates on Germany and the Benelux countries. The bank further offers a variety of interest-free competitive products meeting Islamic finance requirements such as Murabaha deposits. Additionally, HSH Nordbank signed an agreement with Dubai-based Al-Salaam Investment to set up a joint venture company in shipping and renewable energy. Dresdner Bank and WestLB are also involved in Islamic finance. ABC's branch, which is located in Frankfurt, carries a variety of commercial and treasury products and services including Islamic banking and finance (Burghardt and Fuss, 2004). In 2006, Abu Dhabi Investment House launched the € 600 m Gulf German Residences Fund, an Islamic real estate fund, which invested in a portfolio of 100 buildings located throughout Germany. In the same year, the CCH Europe GmBH, a German subsidiary of UK trade finance group, arranged the first Islamic Murabaha-based trade finance facility of US-$ 20 m for Globexbank of Moscow, with the funds provided by a GCC Islamic banks. In 2007, Arab Investment Ltd launched its debut German AIL Fund 1 with an investment of € 400 m invested primarily in a portfolio of commercial properties and shopping complexes in Berlin, Karlsruhe and Dresden (MENAFN Arab News, 2008).

Most importantly, one of Germany's biggest banks, Deutsche Bank (DB), is pioneering capital protected funds in the Gulf. The bank for instance, has co-lead managed MTN issuances for the Jeddah-based Islamic Development Bank (IDB). It also pioneered the Islamic Equity Certificates with National Commercial Bank of Saudi Arabia, a product which the advocators claimed was the first Islamic retail product with universal marketing capability. In 2005, DB announced that it acted as a joint book runner for a US-$ 500 m issuance of AAA rated Sukuk securities for the IDB (Deutsche Bank media, 2005). In 2007, DB closed an Islamic Profit Rate Collar structure with Dubai Islamic Bank (DIB). The transaction was over US-$ 500 m, and is the largest structure done in the Islamic Markets. In 2008, the bank received the go-ahead from the Bank Negara of Malaysia to set up a dedicated Islamic banking subsidiary in Malaysia (WSBI/ESBG, 2009). In 2009, DB announced the launch of "*Al Mi'yar*", a first of its kind platform aimed at facilitating the issuance of Shari'ah compliant securities. Al Mi'yar, the Arabic term that means "*The Standard*", is a Luxembourg domiciled platform, developed by DB, with Luxembourg Financial Group A.G. as the Shari'ah investment manager and Deutsche Bank's Trust & Securities Services group providing the settlement framework (Deutsche Bank media, 2007). Moreover, the Gulf Finance House (GFH) announced it has signed an agreement in 2009 with DB for the placement of its second US-$ 100 m, convertible Murabaha facility. The deal with DB, alongside the existing relationship with Macquarie Groupis indicative of the interest major global financial institutions are now taking in the evolving Islamic finance sector and GFH. The convertible Murabaha instrument is also the first of its kind to be deployed and underlines the progressive and innovative Shari'ah structuring capabilities that GFH can call upon (GFH press release, 2009).

Over and above that, there are many additional activities that have been performed and consequently, are showing the gradual and steady spread of the Islamic finance in Germany. For instance, the financial cooperative baitulmal-finance eGiG for corporate and institutional members and the eGiG for private individuals offer the platform for investing the cooperative capital of the members directly in Islam-compliant participation, or to invest indirectly at an Islamic bank. Moreover, to encounter the existent information deficits in the area of Islamic banking and finance and also to clear up the possible and perhaps the justified reservations against the introduction of Islam-conformable investment products, the Institute for Islamic Banking and Finance (IFIBAF) came into existence in 2006 in one of the main European finance mega cities, Frankfurt am Main. Within a short period, the IFIBAF has established itself as the Nr. 1 in the field of Islamic banking and finance within the German-speaking world.

Additionally, according to the Kuwait Turkish Islamic Bank's (KFH-Turkey) chairman "Mohammed Al-Omar" and the CEO "Ufuk Uyan", the Germany's Federal Financial Supervisory Authority (BaFin) has given the bank the go-ahead to transform its commercial office in the southwest German city of Mannheim into a banking institution providing Islamic banking services. The branch starts to operate at the end of the year 2009 and has been available to customers by the beginning of 2010 (KUNA, 2009).

Unlike UK, Germany faces legal barriers regardless of the cultural and language barriers. While UK may have the pole position in Islamic banking and finance in Europe, Germany could potentially come into view as an even bigger market for Islamic finance on condition that it acknowledges Islamic finance by implementing the appropriate legal framework. To support Islamic finance, German authority should be characterized by an approach of equal treatment for conventional and Islamic finance. Therefore, the Government's financial stability objectives apply equally to all conventional and Islamic financial institutions. However, despite the fact that Germany is one of the largest economies of the world, Islamic finance has not featured as strongly as it has in London's trade and investment relations with the Muslim countries. By and large, it is of course possible to structure Islamic financial transactions in Germany since it already has a more competitive market position than the UK (MENAFN - Arab News, 2008).

2.3.4. The considerable room for growth of Islamic finance in Turkey

It is slightly hard to talk about the Islamic finance level playing field as compared to conventional banking industry in Turkey. This is due to the fact that, there is no particular government support to the sector, Sukuk are pretty infrequent primarily due to the lack of regulatory infrastructure, and also there are no Islamic windows (Wouters, 2008). However, Turkish Islamic houses have not experienced a very remarkable growth as expected. The Turkish participation banks cover only 3.5% or so of the total Turkish banks assets (Fig. 2.19). By and large, "with penetration rates of only 2-4% in many markets, there is plenty of room to sustain the explosive growth currently being experienced in countries like Turkey" (Fig. 2.20) (Oliver Wyman, 2009).

Following the Decree number 83/7506 in 1983, the authorization was given for Islamic finanical institutions to start operations in Turkey and abroad. Since that date, six institutions have been been established (Yuce, 2003). First, foreign Islamic banks have formed partnerships with Turkish investors to create joint companies of: Al Baraka Turkish Special Finance Company,

Faisal Finance Company and Kuwait Turkish Evkaf Finance Company. Afterwords, three institutions (i.e., Anadolu Finance Company, Ihlas Finance Company and Asya Finance Company)

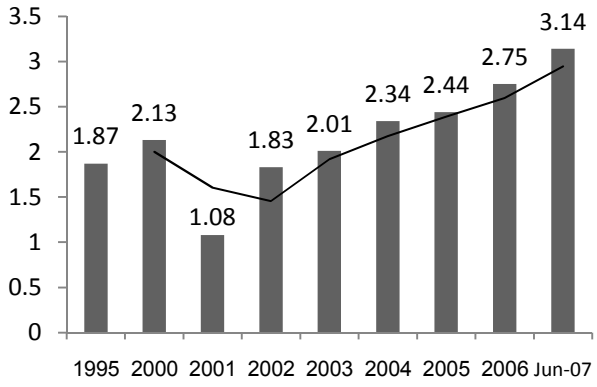


Fig. 2.19: Share of participant banks in the sector (%)
Source: Ahmet Erturk, 6th IADI- Annual conference, (2007)

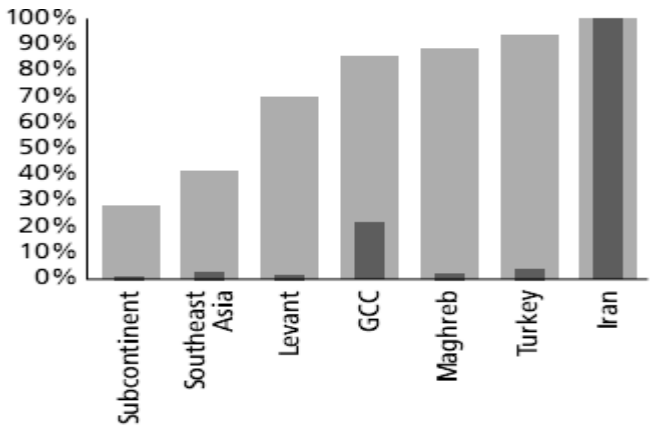


Fig. 2.20: Islamic finance penetration by region
Source: Oliver W. analysis, Bankscope and CIA Fact Book

with only Turkish origins have been formed. After the 2001 financial crisis at Turkey, Ihlas Finance Company was declared bankruptcy, Faisal Finance Company and Anadolu Finance Company have been sold to new owners. As of the beginning of year 2003 there are four Islamic finance companies (special finance companies) in Turkey: **I)** Albaraka Turk participation bank, the part of the Gulf-based Albaraka Banking Group. **II**) Kuveyt Turk participation bank, the part of Kuwait Finance House (KFH). **III)** Turkiye Finans participation bank, the Turkish origin bank that was founded following the merger of the companies Family Finans and Anadolu Finans on 30.12.2005, and eventually **IV**) Bank Asya.

"Turkey, an aspiring EU member, has more Islamic bank branches than any other European country, although the role of Shari'ah compliant finance in its banking system remains marginal" (Wilson, 2007b). In addition to Dubai Islamic Bank (DIB) and Abc Islamic bank, institutions such as: Amlak Finance, Dubai Bank and the National Bank of Kuwait Capital, have established representative offices (or branches) and formed partnerships in order to take an active role in the development of this sector in Turkey. Another transaction that drew a lot of attention in 2006 was that the Qatar-based Doha Bank officially opened its representative office in Istanbul. This followed the strategic alliance between Dubai Bank and Turkey's Daruma Corporate Finance to cooperate in structuring, executing and distributing of Shari'ah compliant corporate finance and merchant banking services. Eventually, Dubai Islamic Bank (DIB) acquire MNG Bank for value estimated at US-$ 160 m (Laurent, 2009), Kuwait-based The International Investor (TII) succeeded taking over Adabank (formerly owned by the UZAN) for a total of US-$ 32 m.

By and large, the Islamic finance sector in Turkey as of 2006 was about 340 branch offices (up from 290 branches at the end of 2005), and is estimated to grow at a rate of 50 new units per year. It is also estimated that the total assets of Islamic banks in Turkey will exceed US-$25 bn and will make up 10% of the total banking system (Wouters, 2007). Recently, a growing number of Islamic finance houses and operations have a presence in Turkey. Dinar Standard had disclosed in 2007 that the HSBC has taken a leading role in the area of Islamic banking and finance with its corporate Islamic facilities to Vestel Electronics and Turkcell, together with the IDB. According to ABC Islamic Bank press release on December 21, 2006, Abc Islamic Bank (E.C.), Gulf International Bank B.S.C. and Standard Chartered Bank are announced the successful close of the syndication for a two-year Murabaha financing facility for Kuveyt Turk Katilim Bankasi A.S. (“Kuveyt Turk”) (“Facility”). Gulf International Bank B.S.C. and Standard Chartered Bank acted as the joint book runners, Abc Islamic Bank (E.C.) is the investment agent while Standard Chartered Bank acted as the documentation bank for the Facility. The Facility marks the first syndication for a participation bank in Turkey. General syndication for the Facility received strong support from the regional and international bank market and the Facility was oversubscribed by more than 100%. Kuveyt Turk opted to increase the Facility amount from the initial US$100 m to US$200 m and banks were nevertheless scaled back. The syndicate comprises 32 leading banks from across Europe and the Middle East.

Notably, Turkey, nowadays, is internationally recognized as being one of the emerging markets. This serves to render Turkey a perfect hub bridging the gap between the east and the west. Despite the banks operating on Islamic principles in Turkey are small, they are rapidly expanding segment of the Turkish financial sector.

Appendix-Ch.2

Table 2.3

Islamic banking and finance in the European countries, USA and the rest of World

Bosnia and Herzegoina

Bosnia and Herzegovina (BiH) is one of the new countries emerged from the former Yugoslavia. It is a country on the Balkan peninsula of Southeastern Europe. BiH is considered as a European country which faced the task of transition from a socialist to a market-based economy. As a European state with a Muslim majority of 40% (Moody's, 2008), the potential for Islamic banking and finance in BiH would appear promising. However, despite the fervor of Muslims to undertake their financial transactions and trades based on Islamic roles, the spread of Islamic banking and finance has been limited. "Much of the explanation for this is political, given the continuing tensions between the different ethnic and religious groups, legal and financial, given the small size of the economy, as well as the existing banking law" (Wilson, 2006).

The major Gulf involvement in Bosnian finance has been through Sarajevo-based Bosna Bank International (BBI). The share capital of BBI amounted to KM 47, 52 m which, at that time, was the largest paid in capital compared to other banks in the country. The shareholders of BBI with resources exceeding US-$ 22 bn are primarily the most powerful Islamic financial institutions from the Middle East. BBI is jointly owned by the Islamic Development Bank (IDB) with 45.46% of the shareholding capital, Dubai Islamic Bank and Abu Dhabi Islamic Bank with 54.54% share of capital equally divided between the two banks. All the financial dealings of these founding shareholders are Shari'ah compliant. BBI is also conducting its operations in a Shari'ah compliant manner.

BBI claims to be the first Islamic bank in Europe, as it was established on September 2000. Roughly, four years before the establishment of the Islamic bank of Britain (IBB) in the UK. Like IBB, BBI is a small institution with a paid-up capital of US-$75 m. The bank faced several challenges at its founding. Let alone the difficulties in getting a license due to negative perceptions amongst non-Muslims, there is no stock market in Sarajevo. Therefore, BBI cannot match IBB in seeking additional equity finance through having a listing on a local Alternative Investment Market (AIM) (Wilson, 2006). Nevertheless, in March 2002, the bank received a permit from the Banking Agency of the Federation of Bosnia and Herzegovina to participate in internal payments operations. In the same year, BBI received a deposit insurance license from the Deposit Insurance Agency of Bosnia and Herzegovina, this, however, raises some Shari'ah compliance issues. For instance, although guarantees are acceptable for current accounts that pay no return, they are not acceptable for investment Mudaraba accounts where the client shares in the bank's declared profits (Wilson, 2004).

Overall, banks in BiH are not allowed to trade. This is an obstacle for BBI to implement Murabaha in any form (Islamic Finance Asia, 2009). As Murabaha is the most common used instrument in Islamic banking and finance, the bank had to design different structures that are acceptable to both bank's Shari'ah board and Bosnian legislation. Because BBI is a small institution with only 11 branches, the range of Islamic finance is very tight in BiH. Currently, most of the bank's operations are retail (Wilson, 2006).

Financially speaking, despite the global financial crisis of 2007, BBI has revealed until the 3rd quarter of the year 2009 an obvious increase in operations. The total bank's assets have been increased by 2.28% due to the growth of client's deposits. Corporate deposits increased by 3.93% whereby sight deposits and time deposits increased by 4.92% and 3.36%, respectively. Due to the increase of time deposits, retail deposits increased by 1.65%. Corporate finance increased by 1.81%, retail financing increased to reach 1.57%. The growth rate of housing financing was 1.54% while long-term financing raised by 2.93%. Eventually, short-term financing and overdraft of current accounts mounted up by 3.6%. Thus, we could argue that Bosnia and Herzegovina would seem a good potential market for Islamic finance despite the many constraints on market growth. The obvious way forward would be for conventional banks to open Islamic finance windows to provide Shari'ah compliant products and for Government to introduce a new Federal banking law.

Azerbaijan

Azerbaijan is a country in the Caucasus region of Eurasia. Recently, some sources consider Azerbaijan to be more closely aligned with Europe. Azerbaijan has completed its post-Soviet transition into a major oil based economy. Azeri gross domestic product (GDP) grew 41.7% in the first quarter of 2007, possibly the highest of any nation worldwide (Caucasian and Central Asian Economic Report (CCAER), 2007). The GDP has been accelerating every year (International Monetary Fund (IMF), 2009a). Azerbaijan has a population of about 8 million. Although Muslims make up 94% of Azerbaijan's population (Moodys, 2008) and the country is a member of the Saudi Arabia-based Is-

lamic Development Bank (IDB), Islamic banking has made virtually no inroads in the country. There are no real stand-alone Islamic banks in Azerbaijan due to the legislation that does not allow them to exist. Despite of that, according to Faig Mammdov, as published in Arab News on May, 2009a, there is a huge demand for housing finance in particular. Hence, because they are the easiest to introduce under the current legislation, an Islamic mortgage based on Murabaha and Ijara are in the process of launching.

Apparently, Islamic banking faces obstacles in Azerbaijan such as; the absence of any regulatory-legislative basis for Islamic banking, the National Bank of Azerbaijan's (NBA) hostile attitude, the lack of the necessary supervisory framework, the absence of an interest-free financial marketplace and lastly, the lack of linkage institutions to provide those entering this sector with information and support (Aliyev, 2009). Nevertheless, there are number of products based on Islamic financial concepts are being offered by some banks in the country. For instance, IBA (the State-owned International Bank of Azerbaijan- that dominates Azerbaijan's financial market with a 43% share in terms of total assets compared with about 45 private sector banks that hold a market share of only 7% or less (Imeson, 2009)) intend to engaged in Islamic banking operations which do not conflict with banking regulations (International Bank of Azerbaijan (IBA) news, 2009).

However, some progress in Islamic financial sector has been made “hidden” under conventional forms of banking activites (Aliyev, 2009). For instance, elements of Islamic finance have been introduced into Azerbaijan via the activities of the "*Kauthar bank*", which positions itself as an Islamic bank. "Kauthar bank" uses Mudaraba, Musharaka, and also the sale of bills of bank comparable to Sukuk. It is however remaining unclear to how this bank is able to do this given existing regulations. This is mainly because the bank is still small, not open to the public and releases little information as well. Historically speaking, Kauthar bank is one of the first commercial banks in Azerbaijan. It has been working in Azerbaijan's bank sector since 1988. The previous name of the bank was "Universal Bank". The new regulation of the bank was affirmed in March, 2001. On September 2001, the bank was registered under the name of Kauthar bank in the Ministry of Justice. In 2002, the National bank gave Kauthar bank the license for all kinds of activity. The bank is considered then as the first bank in Azerbaijan and the second bank in CIS countries that work according to the Islam banking system. The regulation capital of the bank is 10.02 m Manatas. The assets of the bank increased from 320 thousand Manats to 18.3 m Manats during last 7 years. The bank has given up the operation of giving credit to the purchasers with the Islam banking point of view since 2002. Kauther bank as a result of decision to manage its operations on an Islamic banking basis started to clean its loans and debt portfolio of riba in 2005 hence, it sold its interest bearing loans portfolio to Sevindj-M LLC.

Because Azerbaijan is a country with a completely conventional banking system, Islamic financial institutions do not have a special consideration. Hence, the first and the only Shari’ah bank in country "Kauther bank" is considered to be conventional bank according to the official documents (Bekkin, 2009).

Another example of the Islamic financial institutions that are operating currently on Azerbaijan is the Baku, Fineko/abc.az. Islamic Corporation for the Development of the Private Sector (ICD) established this leasing company for the purpose to invest islamically in private business entities in Islamic countries. The company has one of the biggest charter capitals among its leasing counterparts in Azerbaijan.

Switzerland

The Switzerlan is indeed considered as the global financial hub and the world’s leading center for private banking. Despit of that, it has been seen as a "*sleeping country*" in attracting Islamic finance. "Switzerland became one of the latest Western countries to join the booming Islamic finance system, offering a full range of Shari`ah-compliant banking products and services" (Qatari daily, 2009).

Recently, the country shows some involvement in Islamic finance operations. For example, UBS specialized in developing Islamic wealth management services. The bank has created a unique Islamic finance structure that allows their clients in Switzerlan to determine the risk return profile that meets their investment objectives. In 2002, the UBS founded “Noriba” a 100% private wealth management subsidiary specialized on full product range of Islamic investments. In 2006, the business unit was fully reintegrated into the firm under the brand called UBS Islamic Finance (UBS, 2010).

In Geneva, the second-most-populous city in Switzerland, the major early development was the establishment of the "*Dar Al Mal Al Islami trust*" in 1981, largely due to an initiative by Prince Mohamed Al Faisal. "Dar al mal al Islami" is best described as an investment company rather than a bank, although it continues to own 37 % of the capital of Fisal Islamic bank of Egypt as well as 41.7 % share holding in Ithmaar bank (Wilson, 2007b). In 1982, "Faisal Finance" was established in Geneva. Since more than twenty years, the company developed holistically and has built a large international and local client base. Faisal Finance became a bank on October 2006. It has joined the presti-

gious circle of Swiss banks regulated by the Swiss Federal Banking Commission (SFBC). Ithmaar Bank B.S.C. of Bahrain holds 100% of the bank.

However, it is expected that the second private Islamic bank will be established in Switzerland very soon (IslamOnline, 2008). Moreover, Bank Sarasin & Cie AG focuses exclusively on "sustainable private banking" and started to offer Islamic investment fund and Shari'ah compliant financial products. Eventually, the Credit Suisse offers Islamic private banking services in line with conventional products. It offers capital market instruments, asset management and private wealth management solutions based on the Islamic concepts.

Luxembourg

Luxembourg is considered as the centre for fund management. It manages more than 30 Shari'ah-complaint funds (Schoon, 2009). In 1983, Luxembourg was the chosen place for the first Shari'ah compliant insurance"Takaful" company in Europe. Moreover, the Luxembourg Stock Exchange was the first European stock exchange to enter the Sukuk market in 2002 (Flatter and Pie-Pierron, 2009). In 2008, in addition to the 31 Shari'ah compliant investment funds and sub-funds that established in Luxembourg, 16 Sukuk with a combined value of US-$ 5.5 bn or so were listed and traded on the Luxembourg Stock Exchange (Luxembourg Fund Review, 2009). "The Luxembourg office of PricewaterhouseCoopers (PWC) in a report on Islamic finance published at the end of Oct. 2009, has urged greater involvement and visibility from the Luxembourg government and regulators if it is serious about establishing the principality as a European Islamic finance hub especially for Islamic funds and sukuk". The report, suggests that Islamic finance is an important niche business for Luxembourg (Arab News, 2009b).

Spain

In 2006, some conventional Spanish banks such as Santander and the Spanish savings bank "La Caixa" announced their intentions of entering in the Islamic market (Contreras, 2007). According to the World Savings Banks Institute (WSBI) (2009), the national Islamic authority in Spain, "La Junta Islamica" has begun a process for creating an Islamic Bank in Spain. The first phase of this process consists of creating Islamic window facilities in one Spanish bank "Bancorreos" to sell Islamic financial products.

Ireland

Following the introduction of tax neutrality laws to facilitate the issuance of sukuk by UK, France and Luxembourg, Ireland is the latest European Union country to join this trend. According to the " PricewaterhouseCoopers", the Irish Ministry of Finance has introduced significant amendments to facilitate Islamic finance transactions in Ireland, especially the origination and issuance of sukuk. Ireland, like other EU countries, is welcoming Islamic finance and thus, Dublin has emerged as an Islamic investment fund domicile rival to the Channel Islands and Luxembourg. Consecuantly, several Shariah-compliant funds are registered there including the Oasis Crescent Global Equity Fund and the recently-launched CIMB Global Islamic Equity Fund (Arab News, 2010).

Australia

Since the beginning of its operations in 1989, MCCA (Muslim Community Cooperative) has rooted its position at the forefront of Shari'ah compliant finance and investment in Australia. "Home ownership" is one of the main concerns of MCCA to assist Muslim families to realize their goals without compromising their Islamic principles.

Moreover, ICFA Ltd was established in 1997 to fill the gap existed in Australia in fulfilling the desire of growing Muslim community to be able to deal in accordance to their religious principles. Similarly, "Iskan Finance" is established in 2001 as a wholly owned Australian business with the core objective to better service the home financing needs of the Australian Muslim community. In 2002 also, Iskan Finance commenced business with its Murabaha Facilitation Program. It has further developed its "Ijara wa Iqtina" ("lease to purchase") facility.

Eventually, the year 2002 saw the birth of "Salic Pty Ltd" as comprehensive provider of a Shari'ah Approved Lending & Investment Corporation. It is dedicated to helping its customers achieve their financial goals (means saving for retirement, a child's education, buying a new home, or asset building) in line with islamically based principles.

Kazakhstan, Netherland, Russia, and Denmark

Many Islamic banks and financial institutions have been initiated in the rest of world such as LARIBA bank in Kazakhstan. The first experience of applying Islamic finance in Kazakhstan took place in 2003, when "Bank TuranAlem"(BTA) got the first loan on a Murabaha basis, which was fully compliant with Shari'ah. In 2006, two other Kazakh banks "CenterCredit" and "Alliance Bank" also used the opportunity to receive Shari'ah-compliant loans from Islamic banks. In Kyrgyzstan, the "Ekobank" has provided Islamic financial services and products through its "Islamic Window".

In 2007, the finance minister Wouter Bos announced that the Netherlands would review its role in the Islamic finance industry. Since then, De Nederlandsche Bank (DNB) has published a

study on the potential regulatory issues that would have to be addressed when introducing Islamic finance (Schoon, 2009).

In Russia, “Forte-Bank” starts utilizing Islamic financing tools in its operations, through “Badr-Bank”, an Islamic unit established by “Forte-Bank”. In 2000, “Forte-Bank” merged with “Badr-Bank” into “Badr-Forte Bank”. In 2005, a consumer society “Menzil” established under the auspices of “Badr-Forte Bank” to offer Halal residential mortgage programs for Muslims. However, the license of Badr-Forte has been revoked in December 2006. In 2004, on the basis of "Itil" insurance company (Tatarstan Republic located in the very heart of Russia), Islamic insurance directorate was established. The main area of responsibilities of the directorate was working out the concept of takaful in Russia. As the company did not have enough money to realize the project at its own expense, the agreement was reached between "Dubai Islamic Insurance and Reinsurance Company (Aman)" (the UAE) and "Itil" insurance company to joint efforts in order to establish the first takaful operator in Russia. The management of "Itil" planned to convert the company into an Islamic insurance company. In 2005, the first ever Islamic insurance project in Russia based on "Itil" insurance company ended off.

Finally, in 1982, the Islamic Banking International Holding, then part of "Dar al-Mal al-Islami" established Islamic Bank International of Denmark. The Danish Banking Supervisory Board did not recognize an Islamic character of the bank and sometime later the bank was converted into an investment company. It should however, be noted that this happened to most of Islamic banking institutions that emerged in Europe during the period "1970-1980s" (Bekkin, 2007).

USA

Shari’ah-compliant mutual funds are offered by intermediaries such as the Amana Mutual Funds Trust, Azzad Funds, and the Dow Jones Islamic Fund. International financial intermediaries also provide Shariah-compliant financing "SCF" in the US. Islamic investors from the Gulf region have sought to geographically diversify their financial portfolios and to invest their oil wealth in US assets (Ilias, 2010). According to WSBI (2009), the Bahrain-based Arcapita bank has structured many Shari’ah compliant transactions in private equity and real estate in US. US-based companies have taken advantage of alternative funding sources through Islamic-financing abroad. Loehmann’s Holdings, Inc. and East Cameron Gas Company have issued rated Shari‘ah-compliant bonds.

However, many investors consider "SCF" to be more reliable than conventional financing particulalry during the financial crisis (Modi, 2007). As a result, some new Islamic financial instutions were established in US. US have now two Islamic financial institutions i.e., American Finance House (LARIBA) and the University Islamic Financial Corporation, Ann Arbor.

Acknowledgment: some of the non-cited information that has been mentioned in this table was extracted directly from the website of the discussed institution.

References

Ainley, M., Mashayekhi, A., Hicks, R., Rahman, A. and Ravalia A. (2007) 'Islamic Finance in UK: Regulation and challenges', Financial Services Authority (FSA), Nov. Avilable at: http://www.fsa.gov.uk/pubs/other/islamic_finance.pdf (accessed 12 Jan. 2009)

Aliyev, F. (2009) 'Guerilla Islamic finance; Islamic banking the Azerbaijani way', Azerbaijan Diplomatic Academy, Vol. I, No. 13, August 1. Avilable at: http://ada.edu.az/uploads/file/bw/pdf153.pdf (accessed 12 Nov. 2009)

Arab News (2010) 'New Irish Finance Bill to Facilitate Sukuk Transaction', By Mushtak parker, Feb. Available at: http://arabnews.com/economy/islamicfinance/article17033.ece (accessed 12 Dec. 2010)

Arab News-MENAFN. (2008) 'Islamic finance gaining ground in Germany', Nov.10. Available at: http://www.menafn.com/qn_news_story_s.asp?StoryId=1093219798 (accessed 8 Dec. 2009)

Arab News (2009a) 'Azerbaijan is reaching out to Islamic finance', Interview with Mammdov, F. 4th of May. Available at: http://archive.arabnews.com/?page=6&section=0&article=122188&d=4&m=5&y=2009 (accessed 8 Dec. 2009)

Arab News (2009b) 'Luxembourg advised of more involvement in Islamic finance', Nov.16. Avilable at: http://www.arabnews.com/?page=6&section=0&article=128520 (accessed 18 Nov. 2009)

Association of Islamic Banking Institutions Malaysia (2009) 'Nakheel Sukuk Saw Unusual Selling', Dec. 3. Available at: http://aibim.com/content/view/2296/ (accessed 2 Jan. 2010)

Ayub, M. (2007) 'Understanding Islamic Finance', John Wiley and Sons Ltd, England

Aziz, A. (2008) 'Islamic finance news guide: Note from the editor', Electronic copy available at: http://www.islamicfinancenews.com/supplement_2008_IFNGuide.asp(accessed 2 Feb. 2009)

Bashir, A-H. (1999) 'Risk and Profitability Measures in Islamic Banks: the case of two Sudanese Banks', Islamic Economic Studies, Vol. 6, No. 2.

BBC News (2006) 'Non-Muslims snap up Islamic accounts', Dec. 18. Available at: http://news.bbc.co.uk/2/hi/business/6168800.stm (accessed 9 Feb. 2009)

Beck, T., Demirguc-Kunt, A., and Merrouche, O. (2010) 'Islamic vs. Conventional Banking: Business Model, Efficiency, and Stability', Policy Research Working Paper 5446, The World Bank, Development Research Group, Oct.

Bekkin, R. (2007) 'Islamic finance: western and Russian approaches in understanding Islamic finance', from capital markets to real estate, Conference paper, Sep. 19-20, Geneva.

Bekkin, R. (2009) 'Islamic finance in the former Soviet Union', Electronic copy avilable at: http://www.ide.go.jp/Japanese/Publish/Download/Report/pdf/2008_04_07_shiryou.pdf (accessed 9 Feb. 2010)

Blominvest Bank (2009) 'Islamic banking in MENA region', Economic Research Department project, Feb. Avilable at: http://www.blominvestbank.com/Library/Files/Islamic%20Banking.pdf (accessed 19 March. 2009)

Booz & Company (2011) 'Islamic Banking after the Financial Crisis', Presentation made by Dr. Philipp Wackerbeck in Workshop on Islamic Banking & Finance, Universität Hohenheim, Stiftung Kreditwirtschaft, Feb. 18.

Burghardt, I., and Fuß, C. (2004) 'Islamic Banking Credit Products in Germany and in the United Kingdom', European Business School -International University Schloß Reichartshausen

Caucasian and Central Asian Economic Report-CCAER. (2007) 'CEG European Center (Hungary). Available at: http://www.icegec.hu/eng/publications/_docs/ccaer/CCAER_2007.pdf (accessed 13 Apr. 2009)

Central bank of Bahrain-CBB. (2008) 'Islamic Finance Review', Electronic copy, Issue 22. Available at: http://www.bma.gov.bh/page.php?p=industry_newsletters (accessed 13. May 2009)

Cihak, M., and Heiko H. (2008) 'Islamic Financial Services', IMF Survey Magazine, Vol. 37, No. 6 (June).

Colditz, K. (2009) 'Islamic banking – a worthwhile challenge for German banks? The current supply situation of Islamic financial products in selected European markets and potential domestic market demand in Germany', Diploma Thesis, Faculty of International Business, Georg-Simon-Ohm-Hochschule Nürnberg. Available at: http://www.assaif.org/content/download/4097/23916/file/Thesis%20Islamic%20Bankingl.pdf (accessed 28 June. 2010)

Contreras, J. (2007) 'Un Banco Islamico Español para Dos Millones De Musulmanes', El Economista, (22 June). Available at: http://www.eleconomista.es/empresas-finanzas/noticias/233258/06/07/Un-banco-islamico-espanol-para-dos-millones-de-musulmanes.html (accessed 13 Feb. 2009)

Deutsche Bank media (2005) 'Islamic Development Bank issues Sukuk Securities', Electronic copy available at: http://www.deutsche-bank.de/medien/en/content/press_releases_2005_2715.htm(accessed 17 May. 2009)

Deutsche Bank Research (2008) 'GCC Chartbook, a visual essay', available at: http://www.dbresearch.com/PROD/DBR_INTERNET_DEPROD/PROD0000000000220978.PDF(accessed 17 May. 2009)

Dow Jones (2008) 'Islamic Market Indexes, World measures with a new perspective', Electronic copy available at: http://www.djindexes.com/islamic/index.cfm?go=overview (accessed 17 June. 2009)

Dubai Exports and the German Emirati Joint Council for Industry & Commerce-AHK. (2011) 'Islamic Finance in Germany Factsheet', Electronic copy available at: http://vae.ahk.de/en/events/singleview/events/seminar-ueber-islamic-finance-in-deutschland/?no_cache=1&cHash=da767052b9eec6866d1032ca0bb9d102(accessed 19 Feb. 2011)

El-Gamal, M. (2006) 'Islamic Finance, Law, Economics and Practice', Cambridge University Press, UK

Enterprise Ireland (2010) 'The Market: Products versus Services', Electronic Report, Vol. 05, Issue 06. Available at: http://www.enterprise-ireland.com/en/Publications/The-Market/Dec-09-Jan-10-Issue-The-Market.pdf (accessed 23 March. 2010)

ERTÜRK, A. (2007) 'Islamic Banking: Case of Turkey', 6th IADI- Annual conference–Malaysia. Available at: http://www.scribd.com/doc/6340565/Islamic-Banking-Case-of-Turkey-(accessed 24 March. 2009)

Eurekahedge (2008) 'Key Trends in Islamic Funds', Electronic report available at: http://www.eurekahedge.com/news/08_june_EH_Key_Trends_In_Islamic_Funds.asp (accessed 24 May. 2009)

Flatter and Pie-Pierron (2009) 'Islamic Microfinance in Luxemobourg', Electronic report available at: http://www.legal500.com/assets/images/stories/microfinance.pdf (accessed 24 June. 2010)

Gassner, M. (2004) 'Sukuk breathes new life into federal state', Islamic Banking and finance Magazine. Available at: http://www.islamicbankingandfinance.com/summary5.html (accessed 27 June. 2009)

GFH Press Release (2009) 'Gulf Finance House place second US$100 million convertible murabaha facility with Deutsche Bank', Electronic copy avilable at: www.gfh.com/en/category/media/press/gfh/ (accessed 27 Jan. 2010)

Global Market Briefings (GMB) Publishing Ltd. (2008) 'Islamic finance in practice', Issue 2 London. Avilable at: http://www.globalmarketbriefings.com/ (accessed 27 March. 2009)

Gordon, J. (2008) 'French Aiming for Paris to be Islamic Finance Centre', The Financial Times (May-17). Available at: http://www.ft.com/cms/s/0/ceeb285e-2150-11dd-a0e6-000077b07658.html#axzz1htFQybNH (accessed 27 July. 2009)

Gulf One Investment Bank (2008) 'Islamic Finance: Opportunities and Challenges', Research Bulletin, Vol.1, No.1, Dec.

HM Treasury (2008) 'The development of Islamic finance in the UK: the Government's perspective. Electronic copy available at: http://www.hm-treasury.gov.uk/ (accessed 21 May. 2009)

Hussein, K., A. (2004) 'Ethical Investment: Empirical Evidence from FTSE Islamic Index', Islamic Economic Studies, Vol. 12, No. 1, August

Imeson, M. (2009) 'Oil price slump has Azerbaijan preparing for a slowdown', Electronic copy available at: http://www.garp.com/resources/news_feed.aspx?Newsid=3551&id=3670 (accessed 29 May. 2010)

International Bank of Azerbaijan (2009) 'The international bank of Azerbaijan intends to use the Islamic banking experience', The Bank news. Available at: http://www.ibar.az/news/?news=1371&lang=en (accessed 2 Feb. 2010)

International Financial Services London-IFSL. (2008) 'Report on Islamic Finance 2008', Electronic copy avilable at: http://www.ifsl.org.uk/output/ReportItem.aspx?NewsID=32 (accessed 2 Sep. 2009)

International Financial Services London-IFSL. (2009) 'Report on Islamic Finance 2009', Electronic copy avilable at: http://www.ifsl.org.uk/output/ReportItem.aspx?NewsID=32 (accessed 7 Apr. 2009)

International Financial Services London-IFSL. (2010) 'Report on Islamic Finance 2010', Electronic copy avilable at: http://www.ifsl.org.uk/output/ReportItem.aspx?NewsID=32(accessed 18 Apr. 2010)

International Monetary Fund-IMF. (2009a) 'Country information', avilable at: www.imf.org.

International Monetary Fund-IMF. (2009b) 'Regional Economic Outlook, Middle East and and Central Asia', World Economic and Financial Surveys, Oct. Available at: http://www.imf.org/external/pubs/ft/reo/2009/mcd/eng/mreo1009.pdf (accessed 7 Dec. 2009)

Iqbal, Z. and Molyneux, P. (2005) 'ThirtyYearsofIslamicBanking: History, Performance and Prospects Asia', NewYork: Palgrave Macmillan

Islamic Finance Information Service-IFIS. (2009) 'A report on the global sukuk market for first half of 2009', Electronic copy avilable at: http://www.ameinfo.com/208114.html (accessed 9 Sep. 2009)

IslamOnline.net. (2008) 'Second Islamic bank in Switzerland', Electronic copy on Mar. 31. Available at: http://islamineurope.blogspot.com/2008/03/switzerland-second-sharia-compliant.html (accessed 11 May. 2009)

Jobst, A., Kunzel, P., Mills, P., and Amadou Sy. (2008) 'Islamic Bond Issuance – What Sovereign debt managers need to know', International Monetary Fund, policy discussion paper, PDP/08/3.

Kahf, M., Ahmad, A., and Homud, S. (1998) 'Islamic banking and development and alternative banking concept', Collective presentation, IRTI. Available onlie at: http://monzer.kahf.com/papers/english/Isbnk_and_dev_alternative_banking_concept.pdf (accessed 9 Oct. 2010)

Khan, M. F., and Porzio, M. (2010) 'Islamic Banking and Finance in the European Union: A Challenge', Studies in Islamic Finance, Accounting and Governance, Edward Elgar, UK.

Kuwait News Agency-KUNA. (2009) 'Kuwaiti Turkish Islamic bank gets German go-ahead for Mannheim branch', Economics, Sep. Electronic copy available at: http://www.kuna.net.kw/NewsAgenciesPublicSite/ArticleDetails.aspx?Language=en&id=2024755(accessed 9 Oct. 2010)

Laurent, P. (2009) 'What economic future to the Southern Mediterranean', Paper presented at the 10th Mediterranean research meeting Florence and Montecatini Terme, 25-28 March. Available at: http://www.animaweb.org/uploads/File/Inv_MedEconomicFuture%20&SMEs_15-1-09(1).pdf (accessed 19 Aug. 2010)

Lush, E. (2009) 'Islamic finance stakes its claim', Spectator Business Magazine.Oct.09. Available at: http://edielush.com/articles/islamic-finance-stakes-its-claim (accessed 29 Dec. 2009)

Luxembourg Fund Review No.3. (2009) 'Distribution of Shari'ah compliant funds: Luxembourg opportunities for Middle East investors: The international growth of the Shari'ah compliant funds', Electronic copy avilable at: http://www.institutfrancaisdefinanceislamique.fr/docs/docs/doc_id58.pdf (accessed 5 May. 2009)

Mathieu V. (2009) 'The Next Chapter in Islamic Finance: Higher Rewards but Higher Risks', Marsh Mercer Kroll-Guy Carpenter: Oliver Wyman Financial Services. Avilable at: http://www.oliverwyman.com/ow/pdf_files/OW_En_FS_PUBL_2009_IslamicFinance.pdf (accessed 17 May. 2010)

MENAFN - Arab News (2008) 'Islamic finance gaining ground in Germany', Association of Islamic Banking Institutions Malaysia, Nov. 12. Available at: http://www.menafn.com/qn_news_story_s.asp?StoryId=1093219798 (accessed 23 June. 2009)

Modi, V. (2007) 'Writing the Rules: The Need for Standardized Regulation of Islamic Finance', Harvard International Review, spring.

MOHD-KARIM, MUH AMMAD, S. (2010) 'Profit-Sharing Deposit Accounts in IslamicBanking: Analysing the Perceptions and Attitudes of the Malaysian Depositors', Doctoral thesis, DurhamUniversity. Available at Durham E-Theses Online: http://etheses.dur.ac.uk/520/

MONEY works Guides (2008) 'Understanding Assest Allocation in Mutual Funds', In association with HSBC Saudi Arabia Limited. Avilable at: http://www.hsbcsaudi.com/Attachments/HSBC-MF-Guide-en.pdf (accessed 23 June. 2009)

Moody's Investors Service. (2009) 'Global Sukuk Issuance: 2008 Slowdown Mainly Due to Credit Crisis', Special Report, Jan. Available at: http://www.kantakji.com/fiqh/Files/Markets/f156.pdf (accessed 9 Jan. 2011)

Moody's Investors Service (2008) 'Special Comment, Islamic Finance explores new horizons in Africa', Electronic copy on March avilable at: http://www.institutfrancaisdefinanceislamique.fr/docs/docs/doc_id85.pdf (accessed 23 June. 2009)

Morag, N. (2011) 'Comparative Homeland Security: Global Lessons', John Wiley & Sons. Hoboken, New Jersy.

Morgan Stanley research (2008) 'Sukuk- a rising star', MENA – Islamic banks, Feb. Avilable at: http://ae.zawya.com/researchreports/p_2006_06_20_09_19_55/20080220_p_2006_06_20_09_19_55_013213.pdf (accessed 26 Dec. 2009)

Mounira, B., A., Anas, E. (2008) 'Managing Risks and Liquidity in an Interest Free Banking Framework: The Case of the Islamic Banks', International Journal of Business and Management, Vol. 3, No. 9

NewHorizon (2009) 'Largest Islamic banks' assets continue to grow', Electronic copy on Oct. Avilable at: http://www.newhorizonislamicbanking.com/index.cfm?section=news&action=view&id=10840 (accessed 12 Nov. 2010)

Paris Europlace (2008) 'Communiqué de Presse Remise du Rapport Jouini –Pastre à Paris Europlace-Enjeux et Opportunités du Développement de la Finance Islamique pour la Place Financière Française: 10 propositions pour attirer 100 milliards d'euros d'épargne' Nov. Avilable at: http://www.paris-europlace.net/files/doc137647.pdf

Ramadier, S. (2008) 'La Finance Islamique se Fixe de Nouveaux Rendez-Vous en France', Les Echos, Sep. 3. Avilable at: http://archives.lesechos.fr/archives/2008/LesEchos/20249-128-ECH.htm (accessed 19 Juy. 2009)

Schoon, N. (2009) 'Islamic finance in continental Europe: Country report', Electronic copy avilable at: http://www.institutfrancaisdefinanceislamique.fr/docs/docs/doc_id67.pdf (accessed 22 Feb. 2010)

Smyth, Mark J. (2006) 'Islamic Funds Come of Age', Middle East Banker, Nov., 28-30. Avilable at: http://www.failaka.com/downloads/Nov06_BME%20islamic%20funds.pdf (accessed 24 March. 2009)

Standard & Poor's. (2008) 'Chief drivers behind Islamic finance's global expansion', Islamic Finance Outlook. Avilable at: http://www2.standardandpoors.com/spf/pdf/media/Islamic_Finance_Outlook_2008.pdf (accessed 13 May. 2009)

Standard & Poor's (2009) 'Sukuk Market Declined Sharply In 2008, But Long-Term Prospects Remain Strong: Europe, Middle East, and Africa Markets Outlook', Electronic copy avilable at: www.assaif.org/.../file/S&P-Islamic%20Finance%20Outlook%202009.pdf (accessed 23 June. 2010)

Standard & Poor's (2009) 'Total Sukuk issuance by type in the first seven months of 2009, taken from "Prospects for Sukuk market development in UAE', published by Dubai Chamber Economic Research Department, Dec. 2010 – Issue 39. Avilable at: http://web.dcci.ae/LibNewsLetter/EN/EN_February11/eco39.pdf (accessed 15 March. 2010)

Standard & Poor's (2010) 'the Sukuk market has continued to progress in 2009 despite some roadblocks Europe', Middle East, and Africa Markets Outlook, Jan. Avilable at: 6http://www.philadelphia.edu.jo/courses/Markets/Files/Markets/B121.pdf (accessed 15 June. 2010)

The Banker (Global Financial Intelligence) (2007) 'Top 500 Islamic financial institution', Electronic copy avilable at: http://www.thebanker.com/news/fullstory.php/aid/6123/Top_500_Islamic_Financial_Institutions.html (accessed 17 Sep. 2009)

The Banker Middle East (2005) 'Reasons to issue Sukuk and the structures behind them', Electronic copy avilable at: http://www.zawya.com/story.cfm?id=ZAWYA20050207095802&query=gassner&searchmethod=keywords (accessed 25 Dec. 2009)

The Economist, the Economist Intelligence Unit (2009) 'The GCC in 2020: Outlook for the Gulf and the Global Economy', Electronic copy avilable at: http://graphics.eiu.com/marketing/pdf/Gulf2020.pdf (accessed 29 Sep. 2009)

The Federal Financial Supervisory Authority-BaFin. (2009) 'BaFin Conference on Islamic Finance', Electronic copy (Oct.) avilable at: http://www.bafin.de/EN/Home/homepage__node.html (accessed 12 Feb. 2010)

The gulf business news and analysis (2010) 'Annual review of Islamic banking and finance', Novemebr, published by: Hilal Publications, avilable at: http://www.thegulfonline.com/source/IslamicBankingReview.pdf (accessed 23 Feb. 2011)

UK Trade & investment (2010) 'The CiTy –UK excellence in Islamic Finance', URN 07/1657, Nov. Available at: http://www.londonstockexchange.com/specialist-issuers/islamic/downloads/ukti-uk-excellence-in-islamic-finance.pdf (accessed 23 Jan. 2011)

Wackerbeck, P. (2006) 'The Market potential for Islamic banks in Europe', IBF 311, Issue 5. Electronic copy avilable at: http://www.ifibaf.com/index.php/IFIBAF-Islamic-Finance-Islamic-Banking-Trends-Markt-Potential-Islamic-Banking-Europe (accessed 27 May. 2011)

Wilson, R. (1994) 'The experience of Islamic banks in England', in Gian Maria Piccinelli, (ed.), Banche Islamiche in Contesto Non Islamico, (Islamic banks in a non Islamic Framework), Instituto Per L'Oriente, Universita Degli Studi Di Roma, pp. 249-283.

Wilson, R. (2004) 'Regulatory challenges facing the Islamic finance industry', Journal of Financial Transformation, Vol. 14, pp. 140-143

Wilson, R. (2007a) 'Islamic banking – opportunity or threat', Electronic copy (Jan.) avilable at: http://www.commongroundnews.org/article.php?sid=1&id=20262 (accessed 18 Sep. 2009)

Wilson, R. (2007b) 'Islamic Finance in Europe. European University Institute for MUSMINE, Florence', Report Schuman Center for Advanced Studies. Avilable at: http://www.eui.eu/RSCAS/WP-Texts/07_02p.pdf (accessed 19 Aug. 2009)

Wilson, R. (2009) 'Why Islamic Banking Is Successful? Islamic Banks are unscathed despite of Financial Crisis', Electronic copy available at: http://www.isdbforum.org/Subjects/Islam_and_the_Financial_Crisis/rwilson.pdf (accessed 27 July. 2009)

Wilson, R. (2006) 'Islamic banking and finance in Bosnia and Herzegovina', online at Zawya Sukuk Monitor, avilable at: http://www.zawya.com/story.cfm/sidZAWYA20060702104851(accessed 9 March. 2009)

World Savings Banks Institute (WSBI). (2009) 'Islamic banking and finance: Insight on possibilities for Europe', Published by WSBI/ESBG (Oct.). Avilable at: http://www.savings-banks.com/uploadedFiles/Publications_and_Research_(ESBG_only)/Executive%20summary%20perspectives%2060%20GB%20print.pdf (accessed 27 March. 2010)

Wouters, P. (2007) 'Islamic Finance in Turkey: Looking Ahead with Confidence', Electronic copy (June) avilable at: http://www.dinarstandard.com/finance/IFinTurkey061507.htm (accessed 13 May. 2009)

Wouters, P. (2008) 'Turkey: Islamic Banking in Turkey – Indonesia – Pakistan a Swift Comparison and Benchmarking against Malaysia', Electronic copy (Jan.). Avilable at: http://www.bener.av.tr/docs/en/Islamic%20Banking%20in%20Turkey-Indonesia-Pakistan.pdf (accessed 25 June. 2009)

Wyman, O. (2009) 'The Next Chapter in Islamic Finance Higher Rewards but Higher Risks', Electronic copy avilable at: http://www.oliverwyman.com/pdf_files/OW_En_FS_PUBL_2009_IslamicFinance.pdf (accessed 25 June. 2009)

Yuce, A. (2003) 'Islamic financial houses in Turkey', Journal of Academy of Business and Economics, Vol. 1, No. 1, January.

Zawya sukuk monitor (2007) 'Evolution and Rise of Convertible Sukuk', Electronic copy (Aug.). Avilable at: http://www.zawya.com/story.cfm/sidZAWYA20070827123257 (accessed 6 July. 2009)

Chapter 3

Islamic Finance and the Global Economic Crisis

3.1. Preface

It is well known that the US has faced the financial crisis and the credit crunch which threaten the worldwide economic and exposed fundamental weaknesses in the global financial systems in autumn 2007. The whole world has been adversely affected at varying degrees by this crisis. Major European economies have been severely influenced by the sharp economic downturn. Developing economies have also not been immune from the contagious effects of the crisis simply, because they have capitalistic financial markets where large sums of wealth are subject to the process of speculation.

Muslim economists refer to the current global crisis as a result of conventional-interest rate. "Huge budgetary imbalances, excessive monetary expansion, large balance of payments deficits, insufficient foreign aid and inadequate international cooperation can all be related to flaws in the theory of interest, which is also the rote of the crisis" (Iqbal, 2004). The proponents of Islamic banking system expect that the crisis could not happen in Islamic economic (banking) system, mainly because it operates in accordance with the rules, principle goals and functions of Islamic law. The socio-economic justice and the equitable distribution of income are among the most important Islamic goals and functions necessary for a stable economic system. Economics in Islam seeks also to establish a "broad-based economic well-being" with optimum rate of growth and fair and “full” level of employment (Chapra, 2000).

The aim of this part of the thesis is to focus shortly on the financial crisis of 2007 in the global conventional financial market. It will primarily point out the various factors that have contributed to this crisis. The Islamic perspective on such factors will be presented to show how

Islamic economic system might help to bring stability to the world's economic system. Eventually, the real effects of the crisis on Islamic finance will be briefly being discussed.

3.2. The roots of the global financial crisis of 2007

The financial crisis of 2007 is considered to be the worst financial crisis since the Great Depression of the 1930s (Lightman, 2009). The crisis contributed to the collapse of large financial institutions, the bailout of banks by governments and the downturns in stock markets. Booz & Company (2011) introduces three major triggers (origins) of the most recent subprime crisis: Misaligned incentive structures, uncontrolled financial innovations and the Erosion of prudency (Exhibit 3.1). The crisis, however, can be attributed to a number of factors pervasive in both housing and credit markets. The root causes include for example; the inability of homeowners to make their mortgage payments, risky mortgage products, high corporate debt levels (over-leveraging), and international trade imbalances.

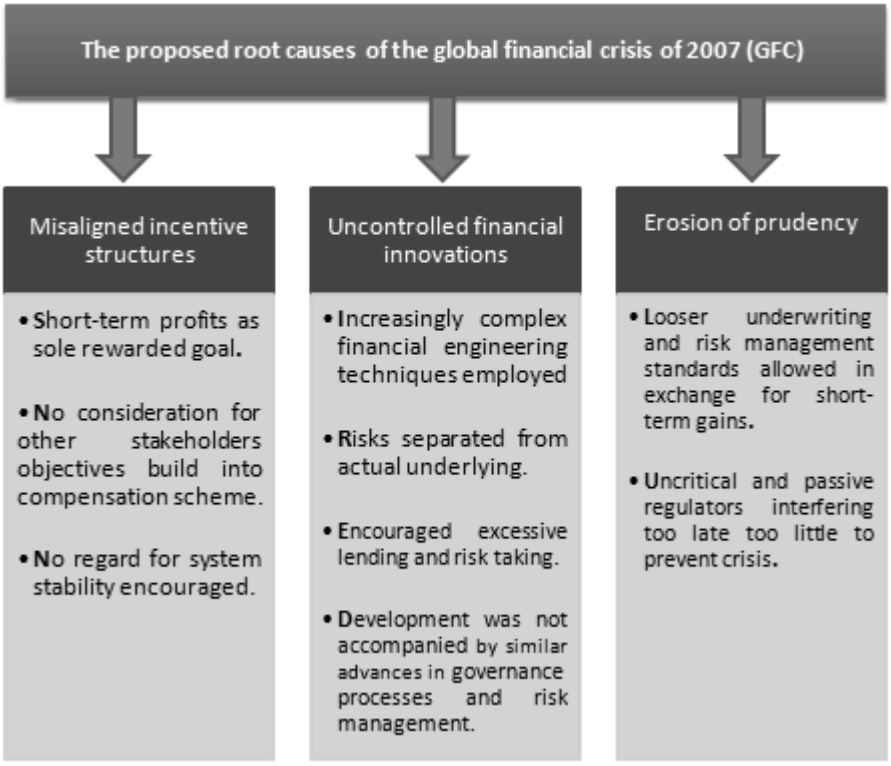


Exhibit 3.1: The origins of the global financial crisis of 2007
Source: Booz & Company, (2011) based on the Islamic Finance and Global Financial Stability Report (2010)

Broadly speaking, the falling interest rates and the huge inflows of foreign funds created easy credit conditions (relaxation of lending criteria) prior to the crisis, fueling the housing bubble and encouraging debt-financed consumption (Das, 2010). As part of the housing and credit

booms, the number of complex structures of financial agreements such as: Mortgage-Backed Securities (MBS) and Collateralized Debt Obligations (CDO), clearly increased. Low initial rates on adjustable rate mortgages (ARM) and low down payment requirements encouraged short-term speculation with the hopes of selling or refinancing at more favorable terms. The collapse of the global housing bubble peaked in US in 2006 caused the values of securities tied to real estate pricing to plummet and the high default rates to increase quickly. Home prices start to decline as interest rates rose creating a poor refinancing environment. Falling prices resulted also in homes to worth less than the mortgage loan, providing an incentive to enter foreclosure. This continues to exhaust wealth from consumers and erodes the financial strength of banks. A rapid increase in default activity followed as home prices failed to rise and mortgagors were unable to refinance upon the expiration of the initial rates. Securities with risk exposure to housing market plummeted, causing great damage to financial institutions. Stock markets suffered large drops in 2008 as questions arose regarding the solvency of major financial institutions and liquidity in the credit markets dried up. Worldwide growth slowed with the tightened credit markets and declines in international trade. Governments, central banks and international organizations implemented different fiscal and monetary expansions plans, in addition to institutional bailouts, in attempting to overcome the crisis (Logojan, 2009, Amin, 2009, Eghan, 2009, and Bhulipongsanon, 2008). However, a simple explanation of what really happened and how the financial crisis of 2007 has started can be found in the appendix.

3.3. The impact of the global crisis on Islamic finance: the case of Dubai debt crisis

In 2009, the financially property development arm of the Dubai government (*Nakheel*) faced default on a USD-$4.1 bn. *Nakheel* was supposed to pay the last rental coupon of the Islamic bonds (Sukuk) and buy back the assets. Unexpectedly, Dubai government asking the creditors to reschedule repayment made the financial world panic. The reaction was sharper in Europe as the boom in Dubai was immensely financed by foreign funds (Table 3.1) such as: Lloyds, RBS and Standard Chartered that have exposure of $5bn or so to Dubai World (Hasan, 2009).

The financial trouble in *Nakheel* made the growing popularity of Islamic banking and finance to be subject to a solidity and stability test. It might be seen as a typical collapse of Islamic finance from the point of view of some analysts. This is because most of *Nakheel's* borrowings are in Sukuk. Based on the Agence France-Presse (AFP), Sukuk are structured to resemble conventional bonds, meaning the risks of ownership are transferred to the issuer rather than

shared by the investors. This suggests that much of Dubai's spending has gone on speculative construction projects. This is, however, considered as one of the criticisms of Islamic products and services. In another word, instead of coming up with products that reflect the spirit of Shari'ah, they are structured very similar to conventional products. It is, additionally, clear that Dubai violated one of the main Islamic principles i.e., "*Shari'ah anti-excessive leverage*" and hence, relied "heavily" on debt and leverage in its rush to build a leading business hub in the region (AsiaOne news, 2009).

Table 3.1

Lending from Western banks to the UAE-2008 and 2009-bn$

The New York Times November 27, 2009

Lending to the United Arab Emirates

Western banks have lent billions for real estate, construction and other investments that have helped fuel the rapid development of Dubai and the six other emirates of the United Arab Emirates.

FOREIGN FINANCIAL EXPOSURE TO THE UNITED ARAB EMIRATES
At the end of March 2009

Total foreign claims: $129.7 billion

European banks:	**93.3 billion**
Britain	**$51.2 billion**
United States	**13.4**
France	11.2
Germany	10.9
Japan	8.9
Netherlands	5.2
Switzerland	4.5
Austria	2.0
Belgium	1.2
Spain	1.1

LOANS BY BANK, UNITED ARAB EMIRATES
At the end of December 2008

HSBC Bank Middle East	**$17.0 bil.**
Standard Chartered Bank	**7.8**
Barclays	**3.6**
RBS (ABN-Amro)	**2.2**
Arab Bank	**2.1**
Citibank	**1.9**
Bank of Baroda	**1.8**
Bank Saderat Iran	**1.7**
BNP Paribas	**1.7**
Lloyds TSB	**1.6**
Habib Bank (Zurich)	**1.4**
United Bank Limited	**0.8**
Arab African Int'l Bank	**0.7**

Sources: Bank for International Settlements (country exposure); Emirates Banks Association (bank loans)

THE NEW YORK TIMES

From another point of view, many analysts believe that the Nakheel crisis is not a sign of any systematic weaknesses in Islamic finance per se and that the concerns about such a crisis have been overstated because of the lack of familiarity with this novel and modern concept of finance. Hundley, (2009) illustrates, for example, that *Nakheel* appears to be going through a "*liquidity crisis, not a wholesale collapse*", and that both Nakheel and Dubai, still have adequate quantity of assets to face such financial crisis. Nakheel's assets were valued at USD-$40 bn against liabilities of just under USD-$20 bn, even after writing down its real estate investments.

By and large, Dubai's trouble reflects the extensive problems associated with the credit crunch of 2007. The story started with Dubai's booming real-estate market "going bust" at the start of 2008. The competition created extra supply, property prices crashed, the average fall being around 40% of their value in 2009, and profit margins are vanishing. "Dubai was in part a victim of the global meltdown and was also overtaken by unguarded optimism and mismanagement" (Hasan, 2009). The world's economic crisis led, indeed, to the emirate's steepest property slump, with home prices dropping 50% from their peak in 2008 (Property Funds World, 2009). Shostak, (2009) suggests that "the key factor behind the crisis in Dubai is the classical boom-bust policies of the UAE central bank" and thus, not purely due to the Islamic finance operations.

3.4. The Islamic solution to the global financial crisis

Despite of the global financial crisis and the emerging dilemma in Dubai, Islamic financial institutions have remained slightly insulated from the global financial downturn. Islamic banks outperformed conventional banks in 2008. They continued to experience significant profitability performance, robust credit and asset growth, and high external credit ratings (McKinsey & Company, 2010)[1]. This is because Islamic law completely prohibits Islamic banks from handling interest-based instruments. Islamic banks didn’t invest in the structured products that based on derivatives thus, haven’t suffered from the fall in such instruments’ values (S&P’s, 2009). Islamic banks tended to be more conservative in their lending practices. Lending could increase the borrower's wealth at the expense of low-income classes. Consequently, lending can not only fuel speculation, but it can also cause inflation when it exceeds savings (Mirakhor, 2009). Islamic banks avoided credit default swaps and kept a high level of liquidity on their balance sheets (Hundley, 2009). Islamic banking prohibits the artificial creation of money by a process known as "fractional reserve". In the fractional reserve practice, banks lend more money than they have in deposits. This creates, consequently, a financial bubble in the economic system, as very little equity can be used as collateral to borrow significant sums of money (Hassan, 2009).

[1] For example, in both Kuwait and Jordan, the Islamic banks' assets grew by 15% in 2008 while the total banking sector grew at 11%. Islamic windows of conventional banks have continued also to grow rapidly. Islamic windows of the top five conventional banks in Qatar and the UAE grew by 80% in 2008 when compared to 2007. The growth in Islamic finance assets has lead to an increase in Islamic banking penetration in key markets. Qatar's Islamic finance sector assets have grown from 12.5% in 2003 to 20.3% in 2008 as a proportion of total banking assets. Turkey's Islamic finance sector has grown from 9.7% in 2003 to 15.7% in 2008 as a proportion of total banking assets (CPI FINANCIAL, 2009b).

Islam also prohibits Islamic banks from selling things not owned which precludes complex contracts such as CDO2 and CDS. Islamic financial system distributes risk in different way as compared with conventional finance. While the same aggregate business losses may arise, their different distribution makes the whole system less likely to result in corporate bankruptcies. Islam imposes on its adherents, either Muslims or non-Muslims, a requirement for ethical practices. Accordingly, Islamic banks should not lend money to customers if such borrowing is not in their best interest. This would, for example, be applied to the provision of Islamic housing finance to sub-prime borrowers who could not afford the cost once any low-cost introductory period had elapsed (Amin, 2009). Eventually, Islamic banks source more funds from deposits than conventional banks. Customer deposits for all Islamic banks in the UAE, Kuwait, Qatar and Saudi Arabia in 2008 represented 69% of liabilities, compared with 54% of all liabilities for conventional banks in the same region and period (McKinsey & Company, 2010).

3.5. Stability and potential of Islamic finance during the financial crisis

It is known that each financial crisis call for new regulations, government guarantee of deposits, and bank bailouts. Mirakhor (2009) stated that during the great depression in 1929, a number of scholars offered a proposal to the government of the US for the reform of the financial system. The decisive of the Chicago reform plan corresponds to a large degree to the core of the financial system that emerges from Islamic fundamentals. The reform proposed a two-tier banking system: **i)** 100% reserve banking that would preclude money creation and destruction by the banking system, which would consequently fully protect deposits and the nation's payments system, and **ii)** a regulated investment banking system without government protection such as a deposit guarantee system of insurance. Islamic finance version converts the second tier into an equity-based system in which interest is prohibited. Mirakhor further added that the theoretical analyses of such a system have demonstrated its inherent stability. This conclusion stems from the fact that no maturity mismatching is possible since there is a 100% money reserve system in place and because any asset-side price inflation or deflation is mapped one-to-one onto the liability side of the balance sheet of the financial institution.

Based on the above discussion, we could initially argue that if the requirements of Shari’ah were properly implemented, the financial crisis of 2007 would not happen. As a matter of fact, at the beginning of the crisis, there is a confident that Islamic finance was relatively immune to the rapidly spreading influence because it was based on ethical financing to support real activities. In

practice, the property bubble has burst in Islamic financial industries just as it has in US. Some banks have suffered, in the early stage of the crisis, a higher rate of non-performing loans than conventional banks, mainly due to their exposure to falling real estate markets. Revenue, profitability and liquidity have been also adversely affected in both 2008 and 2009 (IFSL, 2010). Islamic financial institutions were over exposed to property and equity and so, have suffered substantially from the collapse in confidence which has reduced sukuk issuance (Fig.3.1) and equity funds value. Islamic Finance Information Service (IFIS) has published a report on the global Sukuk market for first half of 2009. The report shows that the global Sukuk issuances continue to decline standing at USD-$ 9.23 bn at June 2009, 20% less than H1-2008. This decline is significant in the GCC-States where most of the Sukuk are dollar denominated and local currencies remain pegged to the dollar.

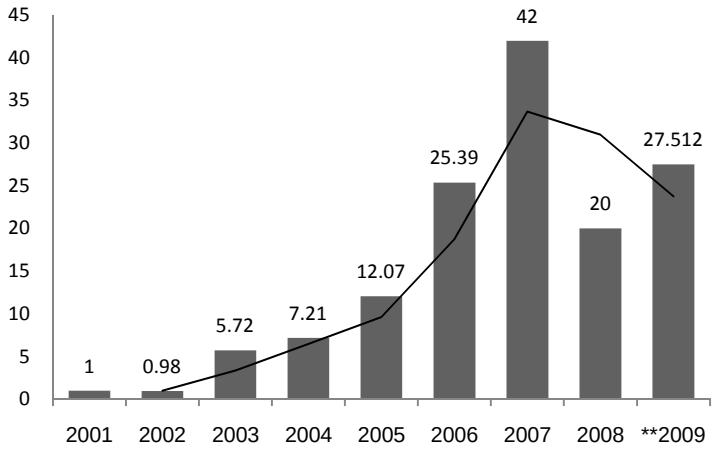


Fig. 3.1: Sukuk global issuance by year- US-$bn annual issues

Sources: Zawya Sukuk Monitor, Islamic Financial Information Service, Moody's (2009 a), IFSL and Ernst and Young IFI, (2009).(: IFSL estimate, **E & Y, IFIR estimate)*

Although global Sukuk markets were negatively affected by the global recession in 2008, Islamic bond issuance rose 40% in the first 10 months of the year 2009. They, therefore, offsetting the 55% decline seen in 2008, and anticipated to reach around 50% by the end of 2009 (Moody's, 2009b). Data from Zawya Sukuk Monitor shows that the value of Sukuk in the third quarter of 2009 rose to $6.2 bn, up 82% from US-$ 3.4 bn a year earlier. According to IFSL (2010), Sukuk issuance rose from the low point of Q4 2008 to reach $6 bn in each of Q3 & Q4 2009, resulting in an annual total of $20bn, up by 30% in 2008.

On a country level, South East Asia dominates the Sukuk market with total issuances reaching US-$ 7.8 bn in 2009, representing 88% of total global Sukuk issuances for the H1-09. Only 12% of H1-09 issuances came from the GCC-States, with total worth of US-$ 1.1 bn. As for Malaysia

and South East Asia, the recovery of the Sukuk market has started in 2009, with issuance increasing by 29% in Malaysia and 93% in Indonesia (Fig.3.2). The Malaysian Sukuk market has been largely unaffected by the global crisis in securities markets. This is because the issuance of sukuk in Malaysia is largely ringgit denominated. The value of the ringgit is determined by a trade weighted basket which has appreciated against the US dollar (IIFM, 2009).

IFIS suggests that the longer term prospects remain strong and look promising as well due to the little possibility of default with Sukuk in the Gulf as issuers can easily meet their payment obligations, given the record oil prices, on the one hand (S&P, 2009). On the other hand, this is due to the fact that the Islamic finance market is small at present compared to the conventional market, so that its capacity to increase is immense. Furthermore, the innovation that Islamic finance has shown in the last years indicates that it is a fast learner and that it is likely to respond to the challenges by emerging as a stronger and larger part of the global financial industry (Farmida BI, 2008).

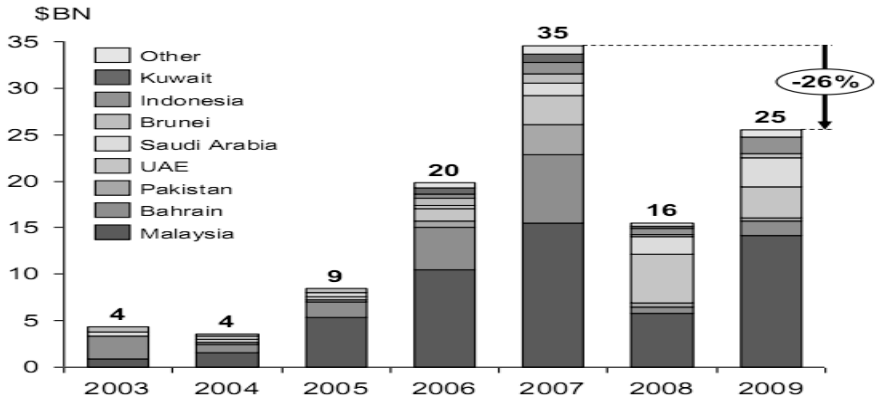


Fig. 3.2: Global Sukuk market - new issuances (by country)
Source: Booz & Company, (2011)

Similarly, equity market has also not been immune to the negative effects of the crisis. The total value of equity funds numbering around 420 in 2008 fell from US-$ 17.2 bn at end-2007 to an estimated US-$ 12.5 bn end-2008 (IFSL, 2009) (Fig.3.3). Strikingly, Eurekahedge estimates that the average return on Islamic equity funds was 22% in 2009, recovering from an average fall of 28% in 2008 (Fig.3.4). This was close to the return on the global equity index, up 25% in 2009 following a fall of 37% in 2008. By and large, Islamic funds have returned an average of 0.1% a year since 2000, better than the -4% generated by global equities, but well short of the 6% achieved by bonds.

Additionally, S&P global benchmark indices of Shari'ah-compliant companies lost further ground over the first quarter of 2009, declining more than 6% due to the financial market disruptions. Despite the liquidity crunch and slowing world economies that hinder market performance, Islamic equity market showed some positive trends in 2009. For example, the S&P Global BMI Shari'ah index, which measures the performance of 4,700 Shari'ah-complaint stocks

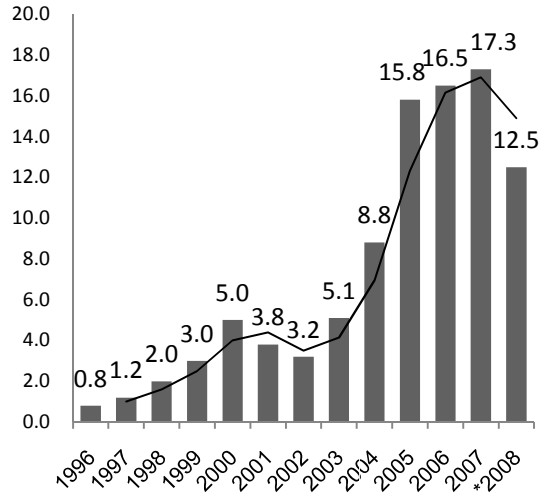


Fig. 3.3: Islamic equity funds worldwide - $bn

Sources: Zawya Sukuk Monitor, Islamic Financial Information Service, Moody's (2009a), IFSL and Ernst and Young IFI, (2009).(: IFSL estimate, **E & Y, IFIR estimate)*

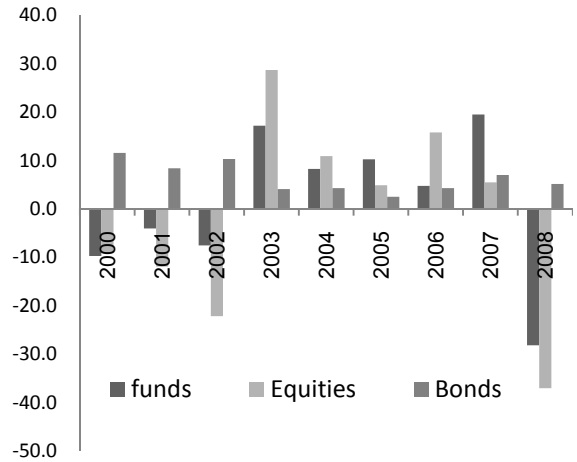


Fig. 3.4. Annual percentage rate of ROA worldwide

Source: IFSL (2009) based on Eurekahedge, Greenwich Alternative Investments and S&P.

across the world's largest developed and emerging markets, eased 6.2% by the end of March 2009, compared with a 20.8% decline over the 4th quarter of 2008 (CPI Financial, 2009 a). Due to the religious restrictions, S&P 500 Shari'ah Index have also survived the financial crisis better than some conventional indexes such as S&P 500 Index (Fig 3.5) (Booz & Company, 2010).

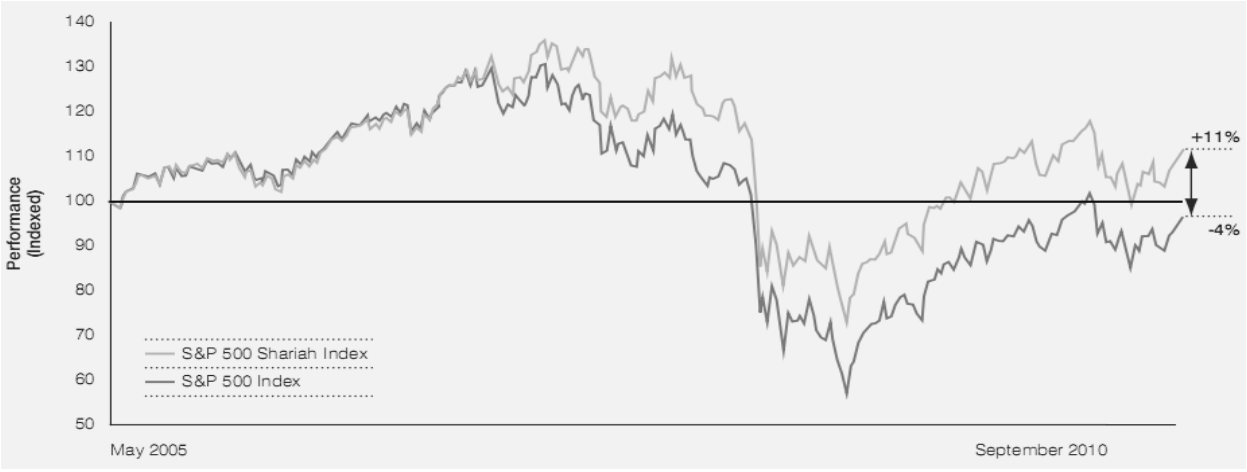


Fig. 3.5: S&P 500 Shari'ah Index vs. S&P 500 Index

Source: Booz & Company (2010) based on International Monetary Fund; Bloomberg; Booz & Company analysis

Over the year 2009, the Dow Jones Islamic Stock Market World Index was up 30.26%, slightly outperformed by the Dow Jones Total Stock Market World Index which was up 30.56% over the same period (Fig. 3.6 and Fig. 3.7) (NewHorizon, 2010). In comparison to the S&P 500 Index which fell a staggering 38.5%, and the Dow Jones Industrial Index that showed a record decline of 33.8% in 2008, the Dow Jones Islamic Financial Index exhibited a more modest loss of 7% for the year (Tayyebi, 2009). Based on the close of trading on 29 March 2011, the global Dow Jones Islamic Market Titans 100 Index, which measures the performance of 100 of the leading Shari'ah compliant stocks globally, dropped 1.22% month-to-date. In contrast, the Dow Jones Global Titans 50 Index, which measures the 50 biggest companies worldwide, posted a loss of 1.80%. Furthermore, the Dow Jones Islamic Market Asia/Pacific Titans 25 Index, which measures the performance of 25 of the leading Shari'ah compliant stocks in the Asia region, decreased 1.32% compared with a loss of 6.13% posted by The Dow Jones Asian Titans 50 Index. In Europe, the Dow Jones Islamic Market Europe Titans 25 Index, which measures the performance of the 25 of the leading Shari'ah compliant stocks in Europe, posted a loss of 2.28%, relative to a loss of 1.54% recorded by the conventional Dow Jones Europe Index.

Fig. 3.6: Dow Jones Islamic Market World Index

Fig. 3.7: Dow Jones Global Total Stock Market Index

Source: Dow Jones Indexes [(2)]; http://www.djindexes.com/islamic/index.cfm?go=overview.

Overall, Islamic investments in shares are essentially the same as those of conventional equity investments. But, the type of stocks is restricted and thus, investments in companies involved in gambling, tobacco or those that have excessive debt (greater than 30% of equity) would not be.

[2] The Dow Jones Islamic Market World Index (DJIM World[SM]) was the first benchmark of investment performance for the global universe of Shari'ah-compliant equities. Since the launch in 1999, the (DJIM World[SM]) family has expanded to provide a wide variety benchmarks tracking Shari'ah-compliant securities including indexes for specific countries, regions, industries and market capitalization ranges. Effective July 27, 2009, the selection universe for the DJIM Indexes includes the components of more than 65 country-level benchmark indexes. To determine their eligibility for the DJIM indexes, the stocks are screened to ensure that each meets the standards set out in the published methodology. A company must meet Shari'ah requirements for acceptable products, business activities, debt levels and interest income and expenses. The methodology is approved by the independent DJIM Index Shari'ah Supervisory Board. However, a detailed explanation of the DJIM World[SM] Indexes is provided in the DJIM Rulebook (2009). Available online at: http://www.djindexes.com/islamic/index.cfm?go=methodology.

Shari'ah compliant. Due to the latter restriction in particular, it appears that Shari'ah compliant investors have benefited from the screening of financial stocks, while their proportion in non-Islamic indices is likely to have contributed to their poor performance

From an empirical point of view, a joint survey has been performed by "HSBC Amanah" and "The Banker Magazine" in (2009) in order to examine the effect of the global financial crisis on Islamic banking and total assets. The survey showed that Islamic banks continue to boost their investments and other assets, while at the same time avoiding mistakes that have bedeviled some of the world's biggest conventional banks in the wake of the global financial crisis and thus Islamic banks perform slightly better during the financial crisis in comparison with conventional banks (HSBC Amanah, 2009). The survey stated also that the assets held by Islamic and conventional banks with Islamic windows rose by 29% in 2009 to US-$ 822 bn, from US-$ 639 bn in 2008. Surprisingly, at a time when asset growth in conventional banks slumped to 6.8% from 21.6% in 2008, balance sheet assets of Shari'ah compliant banks rose 28-29% from USD-$622bn in 2007 to USD-$800bn in 2008, of which USD-$701bn were in commercial banks and USD-$99bn in investment banks. The survey said the Islamic finance industry continues to build a strong track record and is expected to sustain its growth, with assets forecast to hit US-$ 1.033 bn in 2010. According to figures compiled by the Asian Banker, in the face of a global recession, the top-100 Islamic banks saw their combined assets grow by 66% in 2008 (Zawya, 2009). Despite of such a growth, the Islamic aggregate asset total is significantly less than 1% of the top 1,000 world banks' asset.

Moreover, the IMF's latest regional economic outlook-2009 for the Middle East compares the performance of Islamic banks in the GCC states with conventional banks during the global financial crisis. The results indicate that Islamic banks were less affected during the initial phase of the crisis, reflecting a stronger first-round impact on conventional banks through market-to-market valuations on securities in 2008. Nevertheless, in 2009, data for the first half of the year exhibits to some extent larger declines in profitability for Islamic banks, revealing the second-round effect of the crisis on the real economy, especially real estate. Similarly, Arab News (2009) reasserts the superiority of Islamic banks over conventional banks during the global crisis of 2007. They revealed, based on a survey carried out by MTI Consulting, that the IFIs have been less affected by the global recession. 62% of the respondents cited they had experienced little impact from the recent crisis which has devastated banks worldwide. Reflected in the

survey was that 72% of the respondents said less exposure to derivative products was one of factors driving the demand for Islamic finance during the crisis.

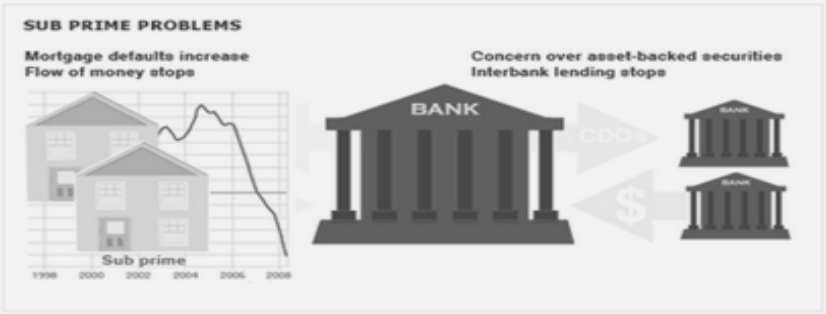
Based on the above discussion and facts, it could be argued that Islamic finance has largely escaped the worst of the financial crisis due to the absence of all conditions that contributed to the financial crisis of 2007. Islamic finance did not entrench in many of the economies that have been worst affected hence, exhibit a promising indicators of financial performance in the year 2010. Additionally, the fact that it is a relatively new phenomenon has meant that Islamic finance industry has perhaps not reached the same stage as conventional finance in terms of innovation and advanced market infrastructure. Thus, IFIs have not been able to participate in the type of transactions which their conventional counterparts have been exposed to during the financial crisis (Tayyebi, 2009).

Appendix-Ch.3

Global Financial Crisis: How it happened part 1

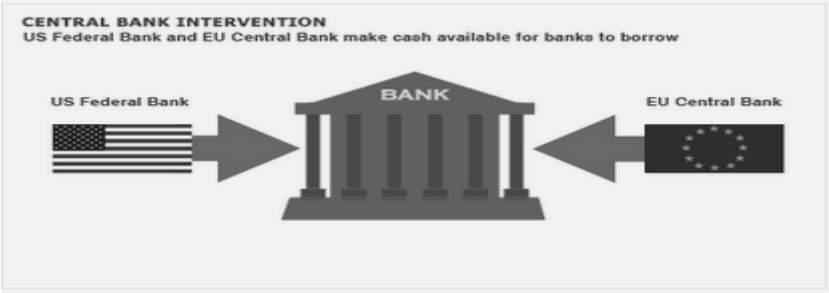
DIRECTLY EXTRACTED "AS IS" FROM: HTTP://WWW.STOCKMARKET-DUBAI.COM/SEARCH/LABEL/BBC **- (DUBAI STOCK EXCHANGE) SUNDAY, MARCH 15, 2009**

Most analysts link the current credit crisis to the sub-prime mortgage business, in which US banks give high-risk loans to people with poor credit histories. These and other loans, bonds or assets are bundled into portfolios - or Collateralized Debt Obligations (CDOs) - and sold on to investors globally



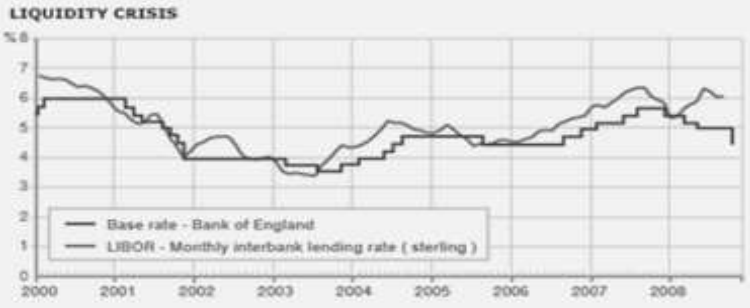
Falling house prices and rising interest rates lead to high numbers of people who cannot repay their mortgages. Investors suffer losses, making them reluctant to take on more CDOs. Credit markets freeze as banks are reluctant to lend to each other, not knowing how many bad loans could be on their rivals' books.

The impact of the sub-prime mortgage crisis is quickly shown to have implications beyond the United States. Losses are felt by investment banks as far afield as Australia. Firms cancel sales of bonds worth billions of dollars, citing market conditions.



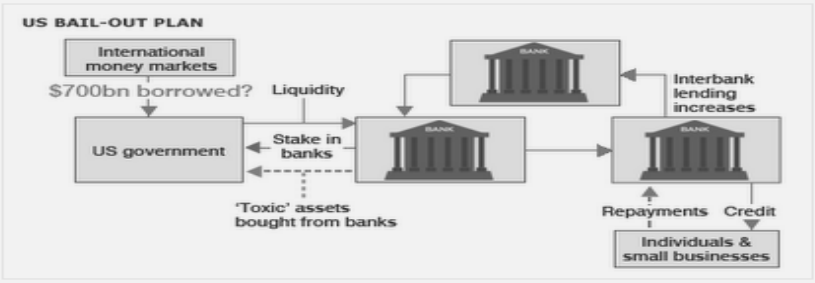
The US Federal Bank and the European Central Bank tries to bolster the money markets by making funds available for banks to borrow on more favourable terms.Interest rates are also cut in an effort to encourage lending.

But the short-term help does not solve the liquidity crisis - or availability of cash for banks - as banks remain cautious about lending to each other. A lack of credit - to banks, companies and individuals - brings with it the threat of recession, job losses, bankruptcies, repossessions and a rise in living costs.



Global Financial Crisis: How it happened part 2

UK bank Northern Rock seeks an emergency loan to stay afloat, prompting a "run" on the bank, as worried customers withdraw £2bn. The bank is later nationalised. In the US, the near-collapse of Bear Stearns leads to a crisis of confidence in the financial sector and the end of investment-only banks.

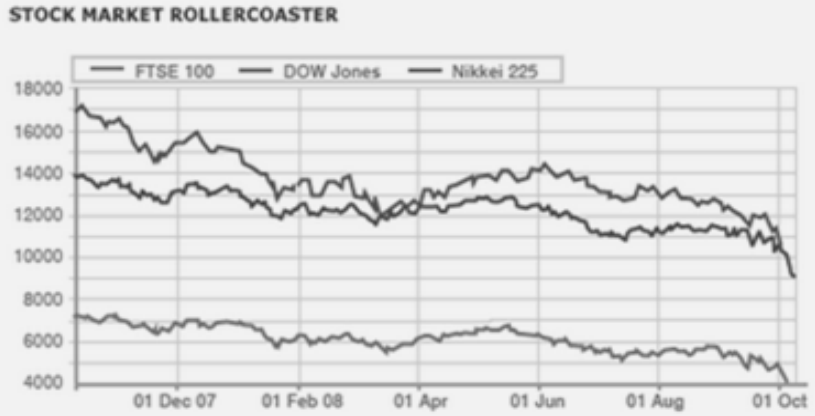


Seeking a long-term solution, the US government agrees a $700bn bail-out that will buy up Wall Street's bad debts in return for stake in the banks. The US government plans to borrow the money from world financial markets and hopes it can sell the distressed assets back once the housing market has stabilised.

The UK government launches its own bail-out, making £400bn extra capital available to eight of the UK's largest banks and building societies in return for preference shares in them. In return for its investment, the government expects to get a stake in the banks - although exactly how much is not quite clear yet.

Economies around the world are affected by the credit crunch. Governments move to nationalise banks from Iceland to France. Central banks in the US, Canada and some parts of Europe take the unprecedented step of co-ordinating a half-point percent cut in interest rates in an effort to ease the crisis.

Shares have risen and fallen with news of failures, takeovers and bail-outs. In part, this reflects investors' confidence in the banking system. While bank shares have been hammered because of bad debts, retailers have been hit as consumer confidence is shaken by falling house prices and job insecurity.



References

Amin, M. (2009) 'Would Islamic finance have prevented the global financial crisis? ', Institute of Islamic Banking and Insurance, PricewaterhouseCoopers LLP, 13 July. Available at: http://www.assaif.org/content/download/3489/20510/file/Mohammed%20Amin%20IIBI%20talk%2013%20July%202009.pdf (accessed 29 Nov. 2009)

Arab News (2009) 'IFIs less affected by recession', MTI. 7 (Dec.). Electronic copy available at: http://www.arabnews.com/?page=6&section=0&article=129198&d=7&m=12&y=2009&pix=business.jpg&category=Business (accessed 12 June. 2010)

AsiaOne news (2009) 'Dubai debt woes give Islamic finance its first big crisis', Electronic copy (Dec.). Available at: http://www.asiaone.com/News/Latest+News/Business/Story/A1Story20091202183596.html(accessed 19 July. 2010)

Bhulipongsanon, P. (2008) 'What caused the economic crisis of 2008? ', Electronic copy (Sep.). Available at: http://www.moolanomy.com/866/what-caused-the-financial-crisis-of-2008/(accessed 19 June. 2009)

Booz & Company (2011) 'Islamic Banking after the Financial Crisis', Presentation made by Dr. Philipp Wackerbeck in Workshop on Islamic Banking & Finance, Universität Hohenheim, Stiftung Kreditwirtschaft, Feb. 18.

Chapra, M. (2000) 'Development Economics: Lessons that Remain to be learned', Journal of Islamic Studies, Vol.42, No.4, pp. 1-12.

Chapra, M.U. (2008) 'The Global Financial Crisis: Can Islamic Finance Help Minimize the Severity and Frequency of such a Crisis in the Future? ', A paper presented at the Forum on the Global Financial Crisis at the Islamic Development Bank (Oct.)

CPI Financial (2009 a) 'Standard & Poor's Shari'ah indices pare losses during first quarter', IBF 510, issue 42, Apr.

CPI Financial (2009b) 'Problems past, future perfect?', Electronic copy (Issue 48-Dec.). Available at: http://www.cpifinancial.net/v2/Magazine.aspx?v=1&aid=2233&cat=IBF&in=48 (accessed 12 Feb. 2010)

Das, D. (2010) 'Current Global Financial Crisis: The great recession and the Nascent Recovery', the Globalization and Development Centre, Bond University. Working paper No.35. Available at: http://epublications.bond.edu.au/gdc/35/ (accessed 12 Feb. 2011)

Dow Jones Rulebook (2009) 'Dow Jones Webpage', Electronic reference available at: http://www.djindexes.com/islamic/index.cfm?go=methodology (accessed 19 Feb. 2010)

Eghan, B. (2009) 'The World Economic Crisis: Challenges to the African Public Administration System', 31ST AAPAM annual round table conference, Kenya institute of administration (KIA), Sep.

Emirates Business (2009) 'Islamic banks out do conventional rivals in the UAE', Electronic copy (Nov.). Available at: http://www.zawya.com/story.cfm/sidZAWYA20091118042608/?relcontent=ZAWYA20070821054718

The 3rd annual Ernst & Young Islamic Funds & Investments Report–IFIR. (2009) 'News release', July, Malaysia. Available at: http://www.zawya.com/story.cfm/sidZAWYA20090525090449

Farmida, BI. (2008) 'The future of Islamic Finance after the credit crunch', BD-#8772710-v1, available at: www.assaif.org (accessed 23 March. 2009)

Hasan, Z. (2009) 'Dubai turmoil before and after the bailout', MPRA Paper No.19484. Electronic copy available at: http://mpra.ub.uni-muenchen.de/19484/1/MPRA_paper_19484.pdf (accessed 27 March. 2010)

Hassan, A. (2009) 'The Global Financial Crisis and Islamic Banking', The Islamic Foundation, UK. Available at: http://www.islamic-foundation.org.uk/IslamicEconomicsPDF/Hassan-financialcrisis-if.pdf (accessed 30 April. 2010)

HSBC Amanah and "The Banker" Magazine (2009) 'Double-Digit Growth for Islamic Banks', Joint survey. Available at: http://www.hsbcamanah.com/amanah/newsroom/press-releases/islamic_fin.html (accessed 12 May. 2010)

Hundely, T. (2009) 'In Dubai, financial crisis looms', Electronic copy (Dec.) available at: http://www.globalpost.com/dispatch/middle-east/091213/uae-islamic-finance-crisis (accessed 30 June. 2010)

International Financial Services London -IFSL. (2010) 'Report on Islamic Finance 2010', Electronic copy (Feb.) available at: http://www.thecityuk.com/assets/Uploads/Islamic-finance-2010.pdf (accessed 15 Feb. 2010)

International Islamic Financial Market-IIFM. (2009) 'Sukuk Report', 1st edition, August. Available at: http://www.institutfrancaisdefinanceislamique.fr/docs/files/14_IIFM_Sukuk__Report_1st_Edition.pdf (accessed 1 March. 2010)

International Monetary Fund-IMF. (2009) 'Regional Economic Outlook, Middle East and Central Asia', World Economic and Financial Surveys, (Oct.). Available at: http://www.imf.org/external/pubs/ft/reo/2009/mcd/eng/mreo0509.pdf (accessed 3 June. 2010)

Iqbal, J. (2009) Islamic financial management, Global vision publishing house, India.

Lightman, D. (2009) 'Congressional Budget Office Compares Downturn with Great Depression', McClatchy Washington Bureau (January, 27). Available at: http://www.mcclatchydc.com/2009/01/27/60822/congressional-budget-office-compares.html (accessed 7 June. 2010)

Logojan, A., I. (2009) 'The Greatest Financial Crises and the Economic Theories', Romanian Economic and Business Review, Vol.4, No.3, 7-16.

Mathieu V. (2009) 'The Next Chapter in Islamic Finance: Higher Rewards but Higher Risks', Marsh Mercer Kroll-Guy Carpenter: Oliver Wyman Financial Services. Available at: http://www.oliverwyman.com/ow/pdf_files/OW_En_FS_PUBL_2009_IslamicFinance.pdf(accessed 19 June. 2010)

McKinsey & Company (2009) 'The Financial Crisis and the Way Forward', The World Islamic Banking Competitiveness Report, reviewed by Robin Amlot on "Problems past, future perfect?" Published on CPI Financial, (Dec.), Issue 48.

Mirakhor, A. (2009) 'Recent Crisis: Lessons for Islamic Finance', Journal of Islamic Economics, Banking and Finance, Vol.5. No.1

Moody's Investors Service (2009) 'Global Sukuk Issuance: 2008 Slowdown Mainly Due to Credit Crisis', Special Report, (Jan.). Available at: http://www.kantakji.com/fiqh/Files/Markets/f156.pdf (accessed 9 Jan. 2011)

Moody's s Investors Service (2009 b) 'Sukuk issuance surges, dominated by government-related issuers', Global Credit Research, Nov. 10. Available at: http://v2.moodys.com/cust/content/content.ashx?source=StaticContent/Free%20Pages/Products%20and%20Services/Downloadable%20Files/Global%20issuance%20of%20sukuk.pdf(accessed 12 July. 2010)

NewHorizon (2010) 'Largest Islamic banks' assets continue to grow', Electronic copy (Oct.) available at: http://www.newhorizonislamicbanking.com/index.cfm?section=news&action=view&id=10840 (accessed 17 Jan. 2011)

Property Funds World (2009) 'Dubai's property woes rattle global markets', Electronic copy available at:
http://www.allbusiness.com/company-activities-management/financialperformance/ 14216987-1.html (accessed 17 Feb. 2010)

Shostak, F. (2009) 'What's Behind the Dubai's Financial Crisis?', Center of the Austrian School of economics and libertarian political and social theory, Ludwig von Mises Institute. Available at: http://blog.mises.org/11119/whats-behind-the-dubais-financial-crisis/(accessed 19 March. 2010)

Standard & Poor's (2009) 'Sukuk Market Declined Sharply in 2008, But Long-Term Prospects Remain Strong: Europe, Middle East, and Africa Markets Outlook', Islamic Finance News, January 14.

Tayyebi, A. (2009) 'Eclipsed by the crescent moon: Islamic finance provides some light in the global financial crisis', Financial services review (June). Available at: http://www.acca.co.uk/pubs/members/publications/sector_magazines/financial_services_review/archive/2009/90/islamic.pdf (accessed 27 July. 2010)

Wilson, R. (2009) 'Why Islamic Banking Is Successful? Islamic Banks are unscathed despite of Financial Crisis', Durham University. Available at: http://www.isdbforum.org/Subjects/Islam_and_the_Financial_Crisis/rwilson.pdf (accessed 27 July. 2009)

Zawya Sukuk monitor (2009)'Assets of top 100 Islamic banks up 66%', article originally published by Arab News, Aug 31. Available at: http://archive.arabnews.com/?page=6&section=0&article=125962&d=31&m=8&y=2009(accessed 27 Oct. 2009)

Chapter 4

Empirical analysis: Part-1 /*Jointly with Burghof, H-P. & Khan, W.*

Islamic commercial banking in Europe: A cross-country and inter-bank analysis of efficiency performance

"Adopted with permission from the Clute Institute-IBERJ, Wed, 6 Jun 2012"

4.1. The abstract

In this chapter we examine the relative efficiency performance of the Islamic Bank of Britain (IBB), the first stand-alone full-fledged Islamic bank in Europe, against conventional banks in the UK, and also against Islamic banks from Muslim-majority countries. We also apply a two-stage Data Envelopment Analysis (DEA) technique in order to regress the efficiency scores on a set of explanatory variables which could potentially influence the efficiency of a bank. In order to investigate the association of the DEA-efficiency scores with the traditional accounting ratios, we estimate the correlation coefficients between the two variables. The efficiency-profitability matrix is further used to evaluate the performance of Islamic banks and also to enable the characterization of the banks' performance profile. Our analysis covers the period from 2005 to 2008.

Results show that the IBB is technically inefficient. It also has relatively a poor financial performance. The bank's inefficiencies are mainly technical (managerial) rather than scale (size) in nature. IBB exhibits, however, positive trends in both efficiency and profitability, particularly in adverse market conditions. Thus, it has a great prospect to increase efficiency and strong potential for further growth in the UK. Results also shows that the technically more efficient banks are necessarily larger, have greater profitability and loans intensity, acquire less debt, and on average have a lower market share. IBB is relatively superior in terms of lending intensity and capital adequacy. Findings further suggest that the DEA measures can be used separately or concurrently with standard accounting measures in determining Islamic banks performance.

4.2. Introduction

Banking is considered as one of the major components of a financial system, since it has a broad impact on the overall financial stability and strength of an economy. It connects economic units and participants in the creation of financial markets. Banking plays a major role of financial intermediation and helps in creation of wealth through the establishment of a series of economic relations. Interest is considered the fundamental source of revenue for banks. As a result, the financial markets and institutions are highly sensitive to changes in interest rates due to their critical role in generating revenues and profits. Any change in the interest rate has an impact on the banking and financial sector. Therefore, the banks are actively engaged in interest rate risk management.

Islamic banking differs from conventional banking in several important ways. The essential feature of Islamic banking is that it is interest-free. Shari'ah-compliant financial institutions do not deal with interest.[1] In Islam, interest is considered as a form of exploitation because it is merely a charge on use of money. Consequently, Islamic banking has its own set of unique risks and challenges. This, however, calls for the development of modern mechanisms to allow interest income to be replaced with cash flows from productive sources, such as returns from wealth generating investment activities and operations, which include for example, profits from trading in (real) assets and cash flows from the transfer of usufruct (the right to use an asset). Modern Islamic financing techniques were developed first in Muslim countries of Asia, notably Malaysia. Since the mid-1990s, the boom in the Islamic banking industry and in the widely acceptable and reliable techniques has risen significantly in the Gulf region mainly due to the sudden increase in oil revenues.

Nowadays, Islamic finance is emerging as an alternative to the conventional banks in many parts of the world. Islamic finance is also attracting conventional investors seeking to get evolved into new investment opportunities. For instance, HSBC *Amanah*, the segregated division of HSBC, provides a range of Shari'ah compliant financial services such as the Amanah bank account and Amanah home services to meet the needs of the UK Muslim community. Barclays Capital, the investment banking arm of Barclays bank plc, is considered as a market-leading franchise in the Islamic bonds "*Sukuk*" market. Ahli United Bank (UK) introduced *Manzil* " the home purchase plans" to help clients purchase residential property in accordance with their relig-

[1] The prohibition of usury (interest) is not specific to Muslims rather its roots are in Christianity and Judaism.

ious regulations. The Arab Banking Corporation (ABC), through its London subsidiary ABC International Bank plc (ABCIB), brings '*alburaq*' to offer Shari'ah-compliant home financing for residential (mortgage) properties in the UK. The Citi Islamic Investment Bank E. C. ("CIIB"), the fully owned subsidiary of Citicorp Banking Corporation, has been continuingly playing a pioneering and innovative role in the industry through Islamic finance windows within Citi. Lloyds TSB have developed a suite of Shari'ah approved products. Last but not least, the Royal Bank of Scotland (RBS)-"Islamic banking" provides customers with consumption and commercial products based on *diminishing Musharaka* and *Murabaha*, etc.[2]

Given the differential behavior of the Islamic banks and the conventional banks, there has always been question about the long run sustainability of Islamic banks which in turn depends heavily on their efficiency performance. The efficiency of conventional banks has been widely studied in the literature to assess the experience of banks in achieving their objectives. Efficiency is defined as a performance measure indicating how prudently a bank is utilizing its resources in producing outputs. It implies improved profitability, better prices and service quality for consumers, and greater amounts of funds intermediated (Berger, Hancock, and Humphrey, 1993). Determining banking efficiency would enable bank's management to identify areas of efficiency and/or inefficiency in comparison to their competitors. Such recognition indeed helps the banks' management to improve its performance and market position. Efficiency estimate captures also the effects of deregulation and financial disruption, institutional failure, problem loans, management quality, market concentration, and the mergers and acquisitions. Thus, the enhanced efficiency in banks contributes to a healthier economy. This is because the banking sector output is highly correlated with economic growth (Berger and Humphrey, 1997).

In practice, to measure banks efficiency, different approaches are applied, either to banks within the financial sector (inter-banking comparison) or to branches within a bank (intra-bank comparison). By and large, Data Envelopment Analysis (DEA) is the widely used efficiency analysis method. The literature on the application of DEA frontier analysis comprises a massive amount of empirical researches, such as Casu and Molyneux (2003).

[2] In diminishing Musharaka (co-ownership), the financier and the client participate either in joint ownership of a property, or in a joint commercial enterprise. The share of the financier is divided into a number of units. The client purchases these units based on a redeeming mechanism until he is the sole owner of the property. On the other hand, Murabaha contract (cost-plus financing) is frequently appears as a form of trade finance based upon letters of credit. This contract involves the sale of an item on a deferred basis. The item is delivered immediately and the price to be paid for the item includes a mutually agreed margin of profit payable to the seller.

From an "academic" point of view, despite the considerable development of Islamic banking sector, there are still few studies which explore the efficiency of Islamic banks. Previous studies focused primarily on the conceptual issues of Islamic banking. The main purpose of this chapter is primarily to bridge this gap in the literature. Our primary contribution to the literature is our undertaking of the first empirical analysis of the relative efficiency performance of IBB, which is considered as the first stand-alone Islamic commercial bank in the Western world. We basically attempt to answer the following two fundamental questions that arise after reviewing a brief literature on the Islamic banking and efficiency measurement techniques: Does IBB produce superior efficiency compared to the counterparties-conventional banks in the UK? Does IBB tend to outperform Islamic banks in Muslims countries?

To answer the former questions, we provide evidence on the performance of the Islamic Bank of Britain (IBB) over the period 2005-2008. This is based on the overall technical efficiency measurement, Data Envelopment Analysis (DEA), which also examines the bank's pure technical efficiency (PTE) and scale efficiency (SE). In order to specify input-output variables, the output oriented-intermediation approach is selected. Furthermore, the DEA efficiency scores obtained from the first-stage are used as dependent variables in the Ordinary Least Squares (OLS) regression model to investigate the effect of multiple factors on banks' performance. Eventually, to further illustrate the relationship between efficiency and profitability we examine, on one hand, the correlation between the DEA scores and the main accounting measurements, ROA and ROE. On the other hand, we measure the efficiency – profitability matrix which has similarity in structure to the product portfolio matrix approach.

This chapter is organized as follows. Section 2 provides an overview of the related studies in the literature. Section 3 discusses the methodology and choice of input and output variables for the efficiency model. Section 4 reports the empirical findings. Finally, section 5 presents the overall concluding remarks.

4.3. Literature review

There is a large body of descriptive literature that offers comparisons of the instruments used in Islamic banking versus conventional banking. It also discusses the legal principles and regulatory challenges related to Islamic banking such as: Jobst (2007), Sundararajan and Errico (2002), and Sole (2007). Existing empirical literature on Islamic banking focuses primarily in assessing the

performance of Islamic banks based on financial ratios. For example, Metwally (1997) tests the primary differences among Islamic and conventional banks in terms of liquidity, leverage, credit risk, profitability and efficiency for 30 banks over the period 1992-1994. The statistical evidence suggests that the two groups of banks may be differentiated in terms of liquidity, leverage and credit risk, but not in terms of profitability and efficiency. Similarly, Samad and Hassan (1999) evaluate the inter-temporal and the inter-bank performance of Bank Islam Malaysia Berhad (BIMB) in terms of profitability, liquidity, risk and solvency, and community involvement for the period 1984-1997. They compare BIMB against 8 conventional banks using the financial ratios. The study finds that BIMB is relatively more liquid, less risky but has low average profit compared to conventional banks.

Rosly and Bakar (2003) evaluate the relative financial performance of the Islamic banking scheme (IBS) against the mainstream banks in Malaysia for the period 1996-1999. The study argues that the IBS higher recorded (ROA) is not due to efficient investment policy but, rather it is caused by technical default. It concludes that the mainstream banks perform better than Islamic banks due to larger market size and greater experience. Additionally, Samad (2004) examines the comparative performance of six Islamic banks in Bahrain against fifteen interest-based conventional commercial banks with respect to profitability, liquidity risk, and credit risk for a period from 1991 to 2001. The results indicate that there are no major differences in profitability and liquidity between Islamic banks and conventional banks. In terms of volume (average dollar business), the performance of Islamic banks is far below the conventional banks in Bahrain. Islamic banks, as newcomers to the financial market, are however performing as well as the conventional banks in a similar age group. In addition, Islamic banks are exposed to less credit risk compared to conventional banks. Interestingly, their credit performance is superior to that of conventional banks.

Based on cross-country analysis, Čihák and Hesse (2008) present for the first time a comparative empirical analysis of Islamic banks' with respect to financial stability. The sample covers individual Islamic and conventional banks in 20 banking systems (i.e. Bahrain, Bangladesh, Brunei, Egypt, Gambia, Indonesia, Iran, Jordan, Kuwait, Lebanon, Malaysia, Mauritania, Pakistan, Qatar, Saudi Arabia, Sudan, Tunisia, United Arab Emirates, West Bank and Gaza, and Yemen) over the period 1993 to 2004. They find out that small Islamic banks tend to be financially stronger than small conventional banks. On the other hand, large conventional banks tend to be financially stronger than large Islamic banks. Meanwhile, small Islamic banks tend to be finan-

cially stronger than large Islamic banks which may reflect challenges of credit risk management in large Islamic banks.

Despite of the extensive conceptual academic works on Islamic banking and finance, and the use of straightforward financial ratio analysis for understanding and predicting the performance of Islamic banks, there are few studies being attempted to empirically measure the efficiency performance of Islamic banks either in Muslim's countries or in Europe. The lack of coherent evidence regarding the efficiency of Islamic banks is likely to be a consequence of the industry small size and newness.

Among those who investigate empirically the efficiency of Islamic banks is Yudistira (2004). He provides new evidence on the performance of 18 Islamic banks in GCC-States, Indonesia, Malaysia, Algeria, Cambia, Sudan, Egypt and Jordan, over the period 1997-2000. The research work is based on efficiency measurement in which Data Envelopment Analysis (DEA) is utilized to analyze the technical efficiency (TE) and scale efficiency (SE) of Islamic banks. Findings indicate that the inefficiency across Islamic banks is, by and large, small at just over 10%, which is quite low compared with many conventional counterparts. Islamic banks suffer slight inefficiencies during the global crisis of 1998-9, but performed very well after the difficult periods. Results also suggest that there are diseconomies of scale for small-to-medium Islamic banks which suggests that mergers should be encouraged.

In 2001, Limam uses a stochastic frontier model to examine the technical efficiency of banks in Kuwait from 1994 to 1999. He reports that most banks in his sample are scale efficient therefore, increasing bank size through mergers and acquisition does not substantially enhance technical efficiency of the merged banks. Limam provides evidence to suggest that the larger bank size, higher share of equity capital in assets and greater profitability are associated with better efficiency.

Most recently, Kamaruddin, Safa, and Mohd (2008) apply DEA technique to present new perspectives on performance of Islamic banking operations in Malaysia during the period 1998-2004. They investigate for the first time both cost and profit efficiency of full-fledged Islamic banks and Islamic windows operations of domestics and foreign banks. They find that Islamic banking operators are relatively more efficient at controlling costs than at generating profits. This means, cost efficiency comes from resource management and economies of scale, respectively.

Overall, there is lack of evidence regarding the efficiency performance of Islamic commercial banks operating in the European financial system. This chapter intends primarily to put that evidence into practice using the non-parametric deterministic approach, DEA.

4.4. Methodology

Several approaches have been developed for measuring banks' level of efficiency [3], ranging from simple financial ratios to complex econometric models. Complex efficiency estimation techniques can be categorized into parametric and non-parametric methods (Berger and Humphrey, 1997). There is no consensus in the literature as to which approach is better as both approaches have advantages and disadvantages. They differ primarily with respect to the assumptions imposed on data. The parametric approaches require assumptions about the particular form of cost or profit function and the distribution of efficiency (Iqbal, and Molyneux, 2005). The non-parametric approaches, on the other hand, require no such specification of the functional form. The most commonly used approaches among non-parametric methods are the DEA and the Free Disposable Hull (FDH). While the most widely used parametric methods are the Stochastic Frontier Approach (SFA), the Thick Frontier Approach (TFA) and the Distribution Free Approach (DFA). In the next section we will consider the application of the efficiency measurement of the DEA approach.

4.4.1. Technical efficiency measurement using DEA-approach

DEA is a non-parametric approach that is considered as an alternative method to estimate productive efficiency [4] in the financial sector. DEA approach shows how a particular bank operates relative to other banks in the same sample. It provides a benchmark for best practice technology based on the experience of those banks in the sample. The DEA estimates are based on technological efficiency where efficient firms are those for which no other firm (or linear combination of firms) produces as much or more of output provided given inputs, or uses as little or less input to produce a given output. The efficient frontier is composed of these un-dominated firms and the piecewise linear segment that connect the set of input/output combinations of these firms yielding

[3] The modern efficiency measurement begins with Farrell (1957). He proposed that the efficiency of a firm consists of two components: technical efficiency (TE), which reflects the ability of a firm to obtain maximal output from a given set of inputs, and allocative efficiency, which reflects the ability of a firm to use inputs in optimal proportions given their respective prices. The two measures are then combined to provide a measure of total economic efficiency (Coelli, 1996).

[4] The concept of production efficiency originated from Cobb and Douglas (1928). The study is premised on the structural relation between inputs and outputs in economic production. Berger and Humphrey (1997) extended the Cobb-Douglas model to the banking sector by focusing mainly on financial sector efficiency.

a convex production possibility set (Bauer, Berger, Ferrier, and Humphrey, 1998).

One of the DEA advantages particularly relevant to our study is that it works well with small samples requiring the smallest number of observations. Another advantage of the DEA is that it enables analysts to identify the sources of inefficiency not apparent from financial results. For instance, studies of benchmarking practices utilizing DEA identify numerous sources of inefficiency in some of the most profitable banks. This is because of the high-profit bank may be quite inefficient in processing transactions, which may not be apparent from financial measures (Cooper, Seiford, and Tone, 2007).

DEA method does not impose any assumption on the structural form of banks as it requires no pre-specified functional form. Rather, the functional form is generated from the sample of the evaluated firms; hence, it reduces the probability of an incorrect functional model (Berger and Humphrey, 1997). DEA can estimate technical efficiency [5] under the assumption of Constant-Returns-to-Scale (CRS) and Variable-Returns-to-Scale (VRS). The CRS assumption is only appropriate when all Decision Making Units (DMUs) are operating at optimal scale. However, factors like imperfect competition and constraints in finance may cause our sample banks not to operate well at their optimal scale of operations.

On the basis of the prior arguments, this chapter compares Islamic banks to counterparties-conventional banks using DEA approach. In order to account for the fact that the sizes of the banks in our sample vary greatly, ranging from large active banks to small banks, we estimate our DEA-model under the assumption of VRS approach (also known as BCC-model), as suggested by Banker, Charnes, and Cooper (1984) and Cooper et al. (2007).

The DEA approach measures efficiency based on either an input-oriented model (i.e. input/output) or an output- oriented model (i.e. output/input). In the former model, the DEA aims to identify technical inefficiency as a proportional reduction in input usage. Meanwhile, in the output-oriented model, technical inefficiency is measured as a proportional increase in output production. To date, the literature is uncertain as to the best choice between the two orientation models. The choice of orientation will not have a major impact on efficiency estimations since both approaches will construct the same frontier, and thus the same efficient DMUs (best perfor-

[5] The term Overall (total) or also called "Technical Efficiency (TE)" is taken from the literature of economics where it is used to distinguish the "technological" aspects of production from other aspects. TE = [Pure Technical Efficiency (PTE)] * [Scale Efficiency (SE)] (Cooper, Seiford, and Tone, 2006).

mers) would be identified. However, inefficient DMUs ranking would possibly change (Coelli, 1996). In this research, we assume an output-oriented approach. Our preference for this measure is due to its reliability and a better fit to our situation. Islamic banks operating under competitive environment hence, strive to offer the best possible products for their clients. Therefore, they are more likely to strength their competitive advantage by increasing outputs production rather than reducing the input usage.

4.4.2. Data and variables

Our methodology differs from literature research papers in various aspects. With respect to sample, unlike other studies, we employ 40 banks. The distribution of banks is illustrated in Table 4.1 below.[6] Moreover, we examine, for the first time, the relative efficiency of the first and the only fully-fledged Islamic commercial bank in the UK i.e. (the IBB), against counterparties-conventional commercial banks in the UK, and also against Islamic banks from Turkey, GCC-States and Malaysia. Furthermore, the study time span 2005-2008 helps to account for the impact of the recent financial crisis on the efficiency of the selected banks.

Table 4.1

Summary statistics of the study population and the selected sample

Types of banks	population	sample*	country	Bank Size	
				Small	Large
I. Islamic bank	50	21	(GCC)-States, Turkey, Malaysia, and the UK**	12	9
II. Conventional bank	158	19	The UK	6	13

* The number of tested banks is significantly reduced due to the exclusion of**: I)** the new banks (age ≤ 4 years), **II**) all banks other than the commercial banks, **III**) banks whose financial statements are incorporated with their parent banks, and **IV**) banks with limited published data [7] ** full list of banks being tested are shown in the appendix.

[6] Our sample is larger than 30 banks. This makes it acceptable, appropriate, and compatible with the previous researches. Basically, the advantage of a sample size equal to or larger than 30 is the applicability of the central limit theorem. However, the population size of our study is quite similar to other studies that employ the DEA technique, such as Darrat, Topuz, and Yousef (2002) and Kamaruddin, Safa, and Mohd (2008).

[7] For instance, in Qatar**:** Alasfa Islamic bank and Masraf al Rayan are new banks. In KSA: Alinma bank is new. In Kuwait: Kuwait international bank is new; Jabeer Islamic bank is under foundation. In Bahrain: Alsalam bank Bahrain is new. In UAE: Emirates Global Islamic bank, Noor Islamic bank, Alhilal bank, and Ajman bank are new; Dubai bank converted to Islamic operations in 2007. In Malaysia: the excluded banks are all new e.g., Affin Islam bank berhat, Alliance Islamic bank Malaysia, Amislamic bank, hongleong Islamic bank, KFH-Malaysia, and standard chartered saadiaq. In Turkey: Bank Asia is private Finance house; turkiye Finans is new; Cyprus Islamic bank is an offshore bank. Oman has no Islamic banks during our study period (2005-08). According to the FAS as on 30 April, 2009 there are 158 banks incorporated in the UK. This number has been shrunk to 19 which is mainly due to the excluded of the: 1) Private Banks such as SG Hambros Bank. 2) Investment banks such as Dresdner Kleinwort. 3) Merchant banks like Gulf International Bank (UK). 4) Banks with special functions like Wesleyan Bank. 5) Development banks such as Crown Agents Bank. 6) Wholesale banks like CIBC World Markets. 7) New banks such as Europe Arab Bank. 8) All banks whose annual report is consolidated with the parent banks such as: ICICI Bank UK Plc, FBN Bank (UK), Reliance Bank Ltd and Ruffler Bank. 9), Islamic windows, such as Hsbc-Amanah.

Empirical studies generally use the banks'total assets as a proxy of their size. We classify Islamic and conventional banks based on average total assets. Banks worth more than £1.5 bn of assets are categorized as large banks, meanwhile, banks worth less are categorized as small.[8] We extract the panel data set from non-consolidated financial statements and employ the computer program (DEA*P*-version 2.1) which was written by Coelli (1996) to construct DEA-frontiers for the calculation of (TE) and (SE) within the selected period.

In the DEA model, if the number of DMUs is small, then an overestimation of efficiency estimates may result (Alirezaei, Howland and Van de Panne, 1998). This is, however, not an issue in our sample because our sample size is large enough. We manage to include all possible banks and valuable input and output variables in the analysis. The number of inputs and outputs in the DEA model should also be addressed. A DEA model with a higher number of variables will have higher efficiency estimates, thus efficient banks on the frontier will be overestimated. If the number of DMUs (n) is less than the combined number of output and input ($O+I$); large portion of the DMUs will be identified as efficient. Hence, it is preferred that (n) exceeds ($I+O$) several times. In this chapter, we follow Cooper et al. (2007) and Darrat et al. (2002) who suggest that in order to have an appropriate number of inputs and outputs (to minimize biased estimations) the product of inputs times outputs should optimally be less than the sample size ($I*O \leq N$). Based on that, the number of banks (DMUs) in each sample model of our analysis is larger than the product of 3 inputs and 2 outputs.

Moreover, one of the most important assumptions to apply DEA is that the DMUs must be homogenous units; they should be performing the same tasks and should have similar objective. This is actually the case of our sample in which Islamic and conventional banks have the same individual final objective to earn profit even if there is differences in how to reach this goal.

4.4.3. Selection of input and output variables

While the multi-product nature of the banking firms is recognized in the literature, there is still no agreement as to the definition and measurement of bank inputs and outputs. The banking liter-

[8] There is no best description of the key characteristics of small and large banks. According to Federal Deposits Insurance Corporation (2008), the banks that had *assets* of less than $1.061 bn, as of December 31 of either of the prior two calendar years, are considered "small". In this chapter, we define the banks which accounts for the top percentile of all banks'aggregate total assets in each banking industry and constitute 85% or so of the total, as "large banks" and those below this level as "small banks". We decide to use £ 1.5 bn of assets as the best cut point for our sample banks. However, in order to classify banks more accurately, we have also adopted number of other factors. These factors are; the bank's market share (measured by total deposits) and the number of employees in each bank.

ature is divided concerning this issue. Researchers take one of two approaches labeled the intermediation and the production approach. The production approach views banks as producers of loan and deposit services using the traditional factors of production i.e. capital and labor. In the intermediation approach, banks act as financial intermediary to collect deposits and purchased-funds, and then transform these into loans and other assets. The intermediation approach is preferable to the production approach to model bank behavior. This is because it does not exclude interest expenses, which accounts for a significant level of bank's total costs. In this chapter, we follow Yudistira (2004) who uses the DEA intermediation approach arguing that the basic principle of Islamic financial system is the participation in enterprise, employing the funds based on the *profit and loss sharing* (PLS). This, inevitably implies the importance of Islamic bank's intermediary activities.

Our DEA-model consists of three-inputs and two-output. More specifically, we use "*total deposits and short term funding*", "*total expenses*" and "*total staff cost or personal expenses*" as inputs. Earning assets, "*total loans*" and "*total revenues*", represent the model outputs (Table 4.2). However, total expenses and total revenues are used as inputs and outputs, respectively, because interest plus non-interest expenses (total expenses), and interest plus non-interest income (total revenues) are considered as the key variables that influence wealth maximization. In our analysis, we replace the interest in conventional banks with income distributed to the depositors in Islamic banks to make the comparison between both types of banks accurate. Table 4.10 (appendix) presents the summary statistics of inputs and outputs.

Table 4.2

The inputs-outputs used in the DEA models [9]

No.	Inputs	Outputs
1.	I_1 : Total Deposits and short term funding	O_1 : Total loans
2.	I_2 : Total Expenses	O_2 : Total Revenues
3.	I_3 : Total Staff Cost	

The degree of correlation between inputs and outputs has a significant impact on the robustness of the DEA model. Hence, a correlation analysis is imperative to establish appropriate inputs and outputs (Chaparro, Jimenez, and Smith, 1999). The correlation between an input (output) variable

[9] Total deposits include: current, saving and investment deposits from customers, banks and other financial institutions. Total staff costs include: wages, salaries, allowances, bonuses, and other staff related costs. In the context of Islamic banking, on the one hand, total loans (the non interest-bearing loans) include financing to customer's banks and other financial institutions that structured under: Murabaha, Ijarah rental, Mudaraba, Istisna, and Musharaka, etc. On the other hand, total revenues include income from investment of depositor's, shareholder's funds and others in the form of Murabaha, Bei Ajel, Musharaka, income from investment in Sukuk, income from Islamic financing assets and placement, management and arrangement fees, income from international Murabaha, commission, fees and foreign exchange, property related income and return to unrestricted investment accounts, etc.

with other output (input) variable needs to be strong (high) as the efficiency scores depend on the choice of input and output variables (Lønborg, 2005). If an input (output) variable has low correlation with all the output (input) variables, it may indicate that this variable does not fit the model (Yang, 2009). Results of correlation analysis for each pair of variables are presented in Table 4.11 in the appendix. As it can be seen, the correlation coefficients between input and output variables and within input variables are high. This means that the bank performance is highly explained by the predictors variables, which is true in the context of Islamic banking, hence, this is a reasonable validation of our DEA models. For instance, the higher comparative performance of Islamic banks deposits requires higher interest expenses, which account for a large portion of total expenses.

4.4.4. The DEA model

To illustrate the applications of DEA, assume we have a set of DMUs where each DMU transforms (*n*) inputs to (*m*) outputs. The efficient DMUs will have the highest ratio of the weighted sum of outputs to the weighted sum of inputs. For each DMU, efficiency (e_s) is calculated as follows **(**Yudistira, 2004):

$$e_s = \sum_{i=1}^{m} u_i y_{is} / \sum_{j=1}^{n} v_j x_{js}, \text{for } i = 1, \dots, m \text{ and } j = 1, \dots, n, \quad (1)$$

For a particular DMU, y_{is} is the quantity of the i_{th} output produced whereas x_{js} is the quantity of the j_{th} input. ui is the output weight while v_j is the input weight. e_s is then maximized under the condition that the ratios for all DMUs are " ≤ 1" as follows:

$$\sum_{i=1}^{m} u_i y_{ir} / \sum_{j=1}^{n} v_j x_{jr} \leq 1, \text{for } r = 1, \dots, N \text{ and } u_i \text{ and } v_j \geq 0, \quad (2)$$

Where Eq.1 ensures that the efficiency ratios are at most one and Eq.2 guarantees that inputs and outputs have positive weights. However, there is a problem with the above formulation due to the unlimited number of solutions it may produce because of its fractional function. Following Charnes, Cooper, and Rhodes (1978), the fractional linear program can be transformed into an ordinary linear program:

$$\text{minimize } e_s = \sum_{i=1}^{m} u_i y_{is} \tag{3}$$

$$\text{subject to } \sum_{i=1}^{m} u_i y_{is} - \sum_{j=1}^{m} v_j x_{jr} \leq 0, r = 1, \dots, N;$$

$$\sum_{i=1}^{m} v_j x_{js} = 1 \text{ and } u_i \text{ and } v_j \geq 0$$

Furthermore, the above program can be transformed into the dual problem as follows**:**

$$\text{minimize } \xi_s$$

$$\text{subject to } \sum_{r=1}^{N} \varphi_r y_{ir} \geq y_{is,} \; i = 1, \dots, m; \tag{4}$$

$$\xi_s x_{js} - \sum_{r=1}^{N} \varphi_r y_{ir} \geq 0, j = 1, \dots, n; \varphi_r \geq 0, \text{and } 0 \leq \xi_s \leq 1.$$

Where (ξ_s) is the overall technical efficiency (TE) scores of the s_{th} DMUs. The unity value of 1 indicates the DMU is on the frontier "*OC*" as shown in Fig. 4.1. Thus, it is considered to be efficient. The DMU that is located to the right of frontier is considered as inefficient which is shown as point *"S"* in Fig. 4.1. The (ξ_s) for *"S"* is then computed by the ratio of (AQ/AS). This yields that the DMU must reduce (*1* - ξ_s) of the input in order to arrive to an efficient DMU at point *Q*. If the linear programming equations (3) and (4) are solved by adding the restriction of φ_{rs} =1, then there are two further efficiency measurements: the variable return to scale (VRS) which can be shown in Fig. 4.1 as *VV'*; and the pure technical efficiency (PTE) which is given by *"*ρ_s = *AR/AS"*.[10] This means that the SE, which is defined as the extent to which a DMU can take advantage of return to scale by altering its size to achieve the optimal scale, is calculated by σ_s = $\xi_s/\rho s$. The fraction of output lost due to scale inefficiency can be measured as (*1* - σ_s) **(**Yudistira, 2004).

SE equals 1 if and only if the technology exhibits CRS (point "B" in Fig.4.1). Scale inefficiency may exist due to either increasing (IRS) or decreasing (DRS) return to scale. To obtain these two

[10] In order to be economically efficient, a bank must first be TE. TE represents the capacity and willingness of an economic unit to produce the maximum attainable output from a given set of inputs and technology. TE is critical to measuring the bank performance, determining the degree of innovative technology adoption and the overall production efficiency. Profit maximization requires a bank to produce the maximum output given the level of inputs employed (i.e. be technically efficient), use the right mix of inputs in light of the relative price of each input (i.e. be input allocative efficient), and produce the right mix of outputs given the set of prices (i.e. be output allocative efficient).

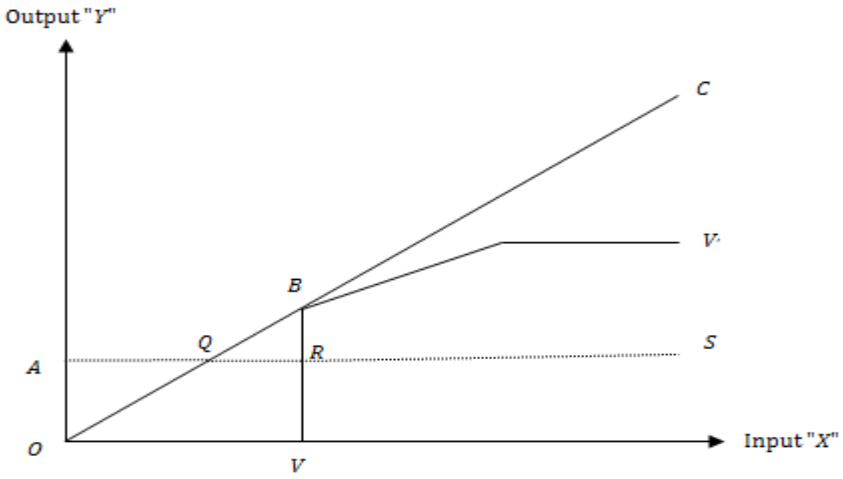


Fig. 4.1. Efficiency measurements using one output and one input

Source: Yudistira, 2004

possible results, the solution of linear programming problems 3 and 4 must be restricted within the sum of the φ_r from 1 to N is ≤ 1 in which the pictorial solution can be shown as "*OBV*" in Fig. 1. The efficiency measure from this technology for the DMU at point S is $\theta_s = AQ/AS$ which also equals ξs. Thus, DRS can be found when $\sigma s = \theta_s$ and IRS when $\sigma s \neq \theta_s$. Above all, efficiency appears when $\sigma s = \theta_s = \xi_S = 1$ (Yudistira, 2004).

A DMU is considered efficient if it has a score of 100% and all slacks are zeros in relation to others. If efficiency score is 100% (at the optimal solution) and some of the slack variables are non-zeros, then there exists a combination of other units which does not dominate the current output vector of the reference DMU but rather it uses less resources. These DMUs may be termed as weakly efficient (Berger and Humphrey, 1997). In DEA, "*slack*" can be defined as overuse of input or under production of output that exists even there is a proportional change in the inputs or the outputs. It represents the improvements needed to convert an inefficient unit to an efficient unit. These improvements are in the form of an increase/decrease in inputs or outputs. Slack might be considered as the amount of inefficiency exhibited by non-efficient DMUs and possibly a consequence of poor performance of inputs, outputs or both. If inputs are being used ineffectively, then we have input slack, and conversely we will have output slack.

As indicated by Coelli, (1996), there are three choices regarding the treatment of slacks: ***i***) One-stage DEA, to calculate slacks residually, ignoring the need for a second optimization step. ***ii***) Two-stage DEA, to move to an efficient frontier by maximizing the sum of slacks required to

move from the first-stage projected point to another, and ***iii)*** Multi-stage DEA, to conduct a sequence of radial linear programs to identify the efficient projected point. In this chapter, we utilize the multi-stage DEA as it is computationally more rigorous and demanding. "The benefits of multi-stage DEA is that it identifies efficient projected points which have input and output mixes that are as similar as possible to those of the inefficient points, and also it is invariant to units of measurement" (Coelli, 1996).

We applied the DEA approach to further examine the input and output "*targets*" for a bank. These targets are the results of respective slack values added on to original outputs, and subtracted from original inputs. Moreover, target for outputs are calculated by multiplying optimal efficiency scores by the outputs and then adding the slack values to that value. However, it should be noted that some of the efficiency improvement options and the target values may not be applicable and cannot be implemented.

4.4.5. Adjustment to the environmental influences: A two-stage DEA-based estimation

Our sample data considered in this analysis has been adjusted for the differences among sample countries by converting into the UK (£) currency using end of year market rates obtained from respective central banks. All variables in all models have been also deflated by the Consumer Price Index (CPI) of each country in order to account for macro-economic differences across countries during the sample period. Furthermore, to test the statistical association of the efficiency estimates with variables that are not inputs and outputs, and to determine their influence on the bias-corrected efficiency scores, we perform the second- stage of DEA method as suggested by Coelli, Prasada, O'Donnell, and Battese (2005). After solving for DEA in the first-stage, the efficiency scores are then regressed upon the environmental variables which could potentially influence the efficiency of a bank.

In DEA, the dependent variable has an upper limit of 100%, and therefore it is a censored variable. If such censoring was the only concern then Tobit regression[11] could have been used. But, we have to deal with biases caused by inefficiency; therefore, Tobit regression is not valid (Kumbhakar and Lovell, 2000). McDonald (2009) advocates using (OLS) in the DEA second-stage because it is considered as a consistent estimator. The following (OLS)-regression model is examined in this work: [12]

[11] The standard Tobit model assumes that the dependent variable is censored with a limiting value 0 and values ranging between 0 and 1.

$$E.1^{13}: (e_s) = \alpha + \beta_1 BP._{jt} + \beta_2 Per._{jt} + \beta_3 Liq._{jt} + \beta_4 Log(A)_{jt} + \beta_5 LTA._{jt} + \beta_6 Depo._{jt} + \beta_7 Ind._{jt} + \beta_8 Age_{jt} + \beta_9 Lev._{jt} + \beta_{10} GDP_{jt} + \beta_{11} Geo._{jt} + \varepsilon \quad (5)$$

Where the subscript "*j"* refers to a bank and the subscript "*t*" refers to a sample year. The dependent variable "e_s" represents the bank's pure technical efficiency (DEA_{PTE}). Detailed description on the independent variables is illustrated in Table 4.12 (appendix).

4.5. Empirical results

This section describes first the DEA results with respect to the efficiency of Islamic banking sector, followed by the results of the second-stage DEA based analysis. It further considers the results from the bank's financial ratio analysis, the correlation analysis of the DEA efficiency scores with financial performance and, eventually, the analysis of the efficiency–profitability matrix.

4.5.1. Efficiency of Islamic banking sector

Table 4.5 illustrates the DEA-efficiency scores of IBB relative to small Islamic banks from Muslim countries (SIBs) listed in model-M1. The results appear in the table indicates that the IBB has efficiency scores of less than 1 (DEA_{PTE}<1) in each sample year. Hence, it is identified as technically inefficient. The bank's mean PTE, based on all sample years, is only 35.2% (calculated as: (91.9%+30.6%+38.1%+40.1%)/4). Thus, it carries out operations, on average, at a significant distance from the efficiency frontier (DEA_{EF}), (Fig. 4.2- appendix).

The bank's inefficiency primarily comes from the revenue side, (output slacks $_{(Revenues)}$ > input slacks $_{(Costs)}$). That is, the bank has non-zero slacks in generating revenues but it has very limited

[12] Under certain assumptions, OLS gives the best result. It is considered as the *Best Linear Unbiazed Estimator* "BLUE". OLS is quite sensitive to the presence of outliers and hence we use "*Casewise Diagnostics*" in *SPSS* to test for this issue. As a rule of thumb, outliers are points whose standardized residual is greater than 3.3 (corresponding to the .001 alpha level). Based on our analysis, results confirmed the absence of outliers in our sample.

[13] In this chapter, the efficiency of Islamic banks is analyzed based on binary comparisons. Two regression models (E1 and E2) were basically measured. The first model (E1: model-M1 and model-M2) measures the relative efficiency of IBB against small and large Islamic banks from Muslim countries (SIBs and LIBs respectively). The second model (E2: model-M3 and model-M4) investigates the relative efficiency performance of the IBB against small and large conventional banks in the UK (SCBs and LCBs), respectively. Empirically, in E2, the dummy "$\beta_{12Islam,jt}$" is added and the variable "$\beta_{10GDP._{jt}}$" is replaced by "$\beta_{10Diver._{jt}}$". The endogenous "DEA_{PTE}" is the pure technical efficiency (PTE) of the i_{th} bank in period t, while, "ε", is the error term. The description of the exogenous variables and the "OLS" main statistical issues are shown in Table 4.12 and 4.13 in the appendix.

non-zero slacks in the usage of recourses (excess costs) (Table 4.5.1- model-M1). Consequently, IBB is better in utilizing resources and controlling costs than generating optimal outputs. These results demonstrate that the IBB has definitely substantial room for improvements in the efficiency by reducing costs further and increasing revenues to sustain competitive edge in the European banking industry.

We summarize the findings further by examining the "efficient output-input targets" for IBB. In order to catch up with (lies closer to) the frontier over time in model-M1, IBB is required to increase its output (total revenues) by £8.604, £9.272, £9.768 and £12.362 bn during 2005 through 2008, respectively. The bank cannot achieve the efficient target levels by augmenting revenues only. The other output (total loans) cannot also be increased because it has zero-slacks. Consequently, IBB should then have reduced its total costs by £1.276 and £1.271 bn in 2006 and 2007 respectively, (Table 4.5.1).

The results seem to imply that the IBB is not only technically inefficient but also inefficient in exploiting the economies of scale given its scale of operations. The inappropriate size (scale) of a bank's operation level (DEA_{SE}) [14] (too large or too small) can lead to overall (total) inefficiency. In 2005, IBB exhibits an increasing return to scale (DEA_{IRS}), and thus, operates at a scale that is too small. The bank could improve efficiency by scaling up its activities by 3.7% (calculated as 1- 96.3%) reaching the score of unity in 2005. In the following three years (2006, 2007, and 2008), the bank has decreasing return to scale (DEA_{DRS}) with DEA_{SE} scores of 93.1%, 96.8%, and 99% respectively. This reveals that the bank is operating at scale that is overly large and thus should shrink the output endowments and activities.

By and large, the overall (technical) inefficiency of IBB appears to be mostly due to pure technical inefficiency (DEA_{PTE}). This is due to the low pure technical efficiency in comparison to scale efficiency (DEA_{PTE} < (DEA_{SE}). For instance, the $DEA_{SE,2005}$= 96.3% > 31.9%, and the $DEA_{SE,2006}$= 93.1% > 30.6%, etc. Since the DEA_{PTE} captures the management practices while the DEA_{SE} indicates whether the bank operates at optimal economies of scale, the above results suggest that inefficiencies are mostly due to inefficient management practices rather than the size of the bank's operation.

[14] scale efficiency (SE) = TE_{CRS}/ TE_{VRS}. (SE) can be interpreted as follows: (***i***) If SE = 1, then a bank is scale efficient and thus, its combination of inputs and outputs is efficient both under CRS and VRS. (***ii***) If (SE <1) or (SE > 1), then the combination is not scale efficient.

In comparison with small conventional banks (SCBs) in model-M3, the results reveal that IBB fails again to appear on the efficiency frontier over the years 2006, 2007, and 2008. IBB is also inefficient compared to the peer conventional banks except Turkish bank (UK) Limited (Fig. 4.4-appendix). The bank's inefficiency results from the cost (input) side as input slacks is greater than output slacks. The bank could decrease its total expenses and staff cost only by, £ 2.71 and £ 0.986 bn in 2005, £ 2.211 and £ 1.861 bn in 2006, £ 1.259 and £ 1.443 bn in 2007, respectively, (Table 4.7.1). Based on the results shown in Table 4.7, IBB has a high DEA_{DRS} through years 2006-2008 with DEA_{SE} equal 91.6%, 90.8%, and 92.2%, respectively. These results show that the bank is scale inefficient. Banks pure technical inefficiency again dominates scale inefficiency. This implies that the main source of banks' inefficiency is the managerial inadequacy rather than non- optimal size of operations.

In model-M2 and model-M4 we compare the efficiency of the IBB against large Islamic banks from Muslim-majority countries and also against the large counterparties-conventional banks in the UK (LIBs and LCBs), respectively. IBB is recognized as inefficient in both models. It has efficiency scores of less than one each year. By and large, IBB is inefficient compared to peer banks. The bank however, has relatively better efficiency performance compared with LIBs but it reports worse performance compared with LCBs. Results show that, while the bank has an increasing trend in efficiency scores compared with large Islamic banks, it has unstable efficiency performance in comparison with large conventional banks. Bank's inefficiency primarily results from the revenue side in model-M2 but in model-M4 it comes from the cost side. IBB has low scale efficiency in both model-M2 and model-M4. PTE scores are consistently higher than the scale efficiency scores. This indicates that the bank is scale inefficient (operating at non-optimal level of operations) and it could improve its efficiency by increasing outputs substantially (Tables 4.6.1 and 4.8.1).

Considering all results from model-M1 through model-M4, it should be noted that the best efficiency performance of IBB appears first in model-M3 followed directly by model-M2, model-M4, and model-M1 respectively, (Fig. 4.2 through 4.5-the appendix). In model-M3, the bank is only 8.6% (calculated as: 1- (average $DEA_{PTE\ (2005\text{-}2008)}$) = (1+90.1%+89.8%+85.6%) /4 = 0.914) far away from the DEA_{EF}, value of 1. In model-M2, IBB is 19.3% away from the frontier (1-0.807 = 19.3%). This amount is much less than the amount the bank requires to become efficient compared with the (LCBs) in model-M4 (1- 0.618 = 38.2%) and with the (SCBs) in model-M1 (1- 0.352 = 64.8%).

The information on efficiency results from Islamic banks grouped by regional area and bank size provides significant insight into the analysis. It displays that the small Islamic and conventional banks are more efficient than large banks. For instance, (SIBs) from (GCC)-States have relatively a higher average mean efficiency score of 90.2% (*calculated as:* $(\Sigma(bank = 1N\ ebi_{(2005-2008)}/n)/(N)$*: for a particular bank,* ebi *is the efficiency scores over the sample period, (n) is the number of years, while (N) represents the number of banks*), as compared to the (LIBs = 81.3%) from the same region. Similarly, (SIBs) from the Malaysian banking industry records relatively high average efficiency score of 83.5% compared to a low mean efficiency scores of 55.4% attained by (LIBs). Likewise, (SCBs) from the UK tend to have higher mean efficiency scores of 96.7% compared to 81% achieved by (LCBs). This clearly suggests that *the "bigger is not necessarily better* ". That is to say, the larger the bank, the less efficient it is and the more it can be affected by the financial instability.

The results from the 4-DEA models show that the small Islamic banks in Muslim countries and the IBB in the UK have initially a declining trend in average DEA_{PTE} over 2005-2007. In spite of the adverse market conditions in 2008, small Islamic banks show a sudden increase in efficiency performance with a higher rate compared with small and large conventional banks and large Islamic banks (Fig. 4.6). IBB has a small asset-size. It is newly-established bank. It has also a set of religious financial constraints. This plays an important role in preventing the bank, as well as all other small Islamic banks, from being severely affected by the global economic crisis and consequently, producing a positive efficiency trend.

4.5.2. Determinants of bank's efficiency: The (OLS) - regression analysis

The second-stage DEA based analysis reveals a different set of results. Similar to Darrat et al. (2002) and Miller and Noulas (1996), who report a positive relationship between efficiency and bank's size, our findings also suggest that the size variable is positively related to banks DEA_{PTE}, statistically significant at 1% level in model-M2, model-M3, and model-M4, (Table 4.9). Contrary to results from the first stage DEA illustrated in section 4.1 (*i.e. the largest scale inefficiencies come from large size banks*), the outcomes of DEA in this stage suggest that large banks are relatively more efficient compared to small banks, apparently due to economies of scale effect. A bank indeed sustains a competitive advantage when economies of scale effects are present [15, 16]

[15] "Under ideal conditions, regression and DEA techniques should produce similar results. This is not the case in practice since application of these two techniques on the same data set often produces strikingly different results"(Cubbins and Tzanikadis, 1998).

Our results also reveal a significant negative relationship between the large banks pure technical efficiency and leverage in model-M2 and model-M4 at 5% and 0.1% level respectively.[17] Such result suggests that the higher performing large banks should acquire less debt. This is because, a higher leverage is related to higher agency costs because of the diverging interests between shareholders and debt holders (Jensen and Meckling, 1976). This moral hazard problem implies a higher risk-taking tendency which could result in greater borrowing costs (Casu and Molyneux, 2003) and low efficiency. Large banks, however, would be subject to systemic risk and possible crises if they were highly leveraged. A small drop in the asset value of a highly leveraged bank leads to distress and possible insolvency particularly in adverse market conditions.

Findings, on the other hand, show that the coefficient of the leverage variable is positive and significant at 10% level in model-M3. This suggests that the small banks with high levels of leverage should be more efficient. This is because leverage, to a reasonable extent, could allow small-sized bank to make lots of safer loans and therefore plenty of investment returns than larger banks can do. In contrast to results for large banks, leverage could reduce agency costs for small banks and thus have positive effects on efficiency. Leverage may also increase the pressure on banks managers to perform better, because it reduces the moral hazard behavior (Jensen, 1986).

Our regression results also show that the accounting measurements (ROA and ROE) have significant positive effects on banks efficiency almost in all models, (Table 4.9).[18] This indicates that more profitable banks are also more efficient. It is common that banks having higher profitability are usually preferred by clients. Therefore, they attract the largest share of deposits and the best potential creditworthy borrowers as well. This creates favorable conditions for the profitable banks to be more efficient.

The findings obtained from DEA-first stage suggest that the overall IBB performs relatively better than some of small and large Islamic banks in Muslim-majority countries, apparently due to its shortened learning curve. Second-stage regression analysis results, in contrast, show that the

[16] There are two main theories about the relationship between bank characteristics and efficiency. The shakeout theory proposes that smaller banks may not be able to obtain management ability and enough capital to successfully operate thus, suggesting a positive relationship between size and performance. Alternatively, "the divisibility theory which holds that there will be no such operational advantage accruing to large banks, if the technology is divisible, that is, small-scale banks can produce financial services at costs per unit output comparable to those of large banks, suggesting no or possibly negative association between size and performance" (Sufian, 2007).

[17] The predictor "Size" is significant in model-M3 (but not model-M1). Although SCBs, IBB, and SIBS have assets of less than £1.5 bn, an examination of banks financial statements reveal that SCBs and SIBs are still larger than IBB. So, apparently they enjoy relative scale economies over IBB.

[18] Due to the high correlation between ROA and ROE (model-M1, r= 0.795. model-M2, r=0.933, model-M3, r=0.913, model-M4, r=0.821), the later measure was dropped from the analysis.

relationship between the dummy variable region, (1= if the bank is located in Europe, IBB for example), and a bank's DEA_{PTE} is significantly negative in model-M1 and model-M2 at 10% and 0.1% level, respectively. This implies that geographical location is a differentiating factor, while assessing the efficiency of banks, which might in part, be due to the unique regulations in the country where the bank operates. Such results demonstrate that small Islamic banks in Europe (IBB in our case) are less efficient than Islamic banks (either small or large) operating in the Middle East (GCC-States), Southeastern Asia (Malaysia) and Eurasia (Turkey). This indicates, however, that the Islamic banks outside Muslim-majority countries experienced more difficulties, particularly during the global economic crisis, to reach the optimal levels of efficiency which could be due to strict conventional regulations.

The proxy of market share (the total deposits) reveals a statistically significant negative relationship with the DEA_{PTE} in model-M2, model-M3, and model-M4 at 1%, 0.1% and 5% levels, respectively. This suggests that lower market share is associated with the banks which enjoy a higher degree of efficiency thus diminishing the market leadership argument. Such a result implies that banks with small market share can be equally efficient or even more compared to market dominant banks. It appears that maintaining or expanding markets share might involve additional costs and resources that might reduce efficiency.

Based on our analysis, results indicate that the dummy variable (ISLAM) is negatively statistically significant predictor of banks' performance at 1% level in Model-M3 (IBB is the only Islamic bank in this model). The coefficient of this predictor shows a significant smaller DEA_{PTE} scores for IBB compared to other banks. Such a result offer evidence that the small conventional banks in the UK perform considerably different and relatively better than IBB in terms of efficiency performance.

We observed that the dependency factor has an insignificant relationship with DEA_{PTE} in the context of Islamic banking. Nevertheless, results from the conventional banking industry, in model-M3 and model-M4, show a significant inverse relationship between the two variables at 10% and 5% level, respectively. These findings illustrate that subsidiaries, or conventional banks acting as a part of a banking group, have lower efficiency scores compared to the stand alone banks.[19]

[19] By testing both model-M1 and model-M2 together (i.e. regardless of the size differences) the dependency measure reveals a significant positive relationship with the efficiency scores at 5% level. Such result indicates that the Islamic subsidiaries perform better than stand-alone banks. This might be due to the small size of subsidiaries since the Islamic product schemes become more complex as the size of Islamic banks increase which negatively affect the bank's efficiency.

To control the bank-specific lending intensity, we use total loans divided by total assets as a proxy. Bank loans are expected to be the main source of revenue thus, are expected to impact efficiency positively. In our analysis, the proxy of bank's loan intensity reveals an insignificant positive relationship with all DEA_{PTE} in both, model-M1 and model-M3. Those findings imply that small banks with higher loans intensity might have either higher or lower efficiency. In contrast, we find a significant positive coefficient in model-M2 and model-M4 at 10% level.[20] The results indicate that, loans of a large bank seem to be more highly valued than alternative bank outputs, i.e. investments and /or securities. This might support the idea that the banks market capability to offer more competitive loan portfolios might be a resulted from their efficient operations. This is due to their ability to perform more productively with lower costs (Sufian and Zulkhibri, 2007).

To capture the possible effects of the liquidity and the absence of the international inter-bank money markets for Islamic banks on their efficiency, the liquid assets to total deposits and short term funding ratio is used as a proxy. We expect that banks with a higher amount of net liquid assets will be less efficient. Banks seek to balance the benefits of high levels of liquidity with the costs of high liquidity. Such balancing may adversely affect the investment returns. Our empirical analysis reveals an insignificant relationship between banks liquidity and their performance in model-M1, model-M3, and model-M4. Surprisingly, the predictor variable (liquidity) in model-M2 reveals a negative significant relationship with DEA_{PTE} at 1% level. This indicates that large Islamic banks that accumulate a significant amount of liquid resources might operate under worst efficiency conditions. This also suggests that the excess liquidity, due to the Islamic law restrictions, has to be invested to achieve efficiency gains. However, too little liquidity might force the bank to borrow at penal rates from the interbank market and/or central bank. However, this is not viable for Islamic banks due to the absence of international inter-bank money market.

With respect to the relationship between the bank's age and its $DEA_{PTE,}$ we find an insignificant negative association between the two variables in all models. Theoretically speaking, this could be due to the fact that older banks are not flexible to make the rapid adjustments to changing circumstances as opposed to new banks that have a short learning curve, and are considered more innovative and entrepreneurial (Kapelko, Prior-Jimènez, Rialp-Criado, 2008). However, one stream of research suggests that new banks suffer from liability of newness, not only because of

[20] "α" is the significance level that the researchers decide to accept. The choice of it is somewhat arbitrary, although in practice values of 0.1, 0.05, and 0.01 are common and generally considered "acceptable". However, at a given level of alpha, the smaller the p- value, the higher the probability of rejecting the null hypothesis.

the risk of their loans, but also because depositors and established banks will demand premium if they are to invest in these young banks (Gorton and Winton, 1998).

Our results demonstrate an insignificant relationship between the product diversity and banks DEA_{PTE}.[21] Similarly, results also failed to produce a conclusive and casual correlation between increased investment in skills and increased efficiency. Efficiency of human resource management has shown a statistically insignificant relationship with DEA_{PTE}.[22] In theory, personal expenses are estimated to impact performance negatively because efficient banks are expected to operate at lower cost. Despite of that, the usage of new electronic technology has made the wage expenses to fall, therefore, the lower cost ratio may impact performance positively.

Eventually, Findings failed to find any evidence of an association between the growth rate of GDP and the banks DEA_{PTE}. Our results do not support the idea that the favorable economic conditions seem to stimulate higher efficiency due to supposedly positive effect on the demand and supply for banking services.

4.5.3. An overview on the bank's "Financial Ratios Based Analysis" -(FRA)

We extend the study further by examining the determinants (the exogenous variables) of a bank's efficiency. Results reveal that, the small Islamic banks from Muslim-majority countries and IBB from the UK demonstrate stronger capital adequacy ratios compared to large conventional banks. Small conventional banks are better run compared to all other banks in the sample (Table 4.14-appendix). It is significantly more complex for Islamic banks to adjust their credit risk monitoring system as they become bigger. Large Islamic banks tend to engage more in profit and loss sharing (PLS) arrangements compared to small ones thus, monitoring (PLS) schemes becomes more diverse and difficult to standardize which results in adverse selection and moral hazard (Čihák, and Hesse, 2008). However, large Islamic banks from Muslim countries are finan-

[21] We find a negative insignificant relationship between the predictor "diversification" and the DEA_{PTE} in model-M4. The diversification predictor has been dropped from model-M3 to allow for better results and to meet the regression main assumptions. This leaves the question of whether Islamic banking diversification lead to efficiency or not. However, the universal set of investment to Islamic banks is limited due to Shari'ah restrictions, thus they enjoy a lower diversification benefit than their conventional counterparts. Nevertheless, Islamic banks have recently facing regulations that create incentives to diversify their portfolios. For example, each source of financing that a bank earn raise implies a different degree and type of market discipline. Equity-holders care about returns to their equity and might prefer riskier portfolio than would debt-holder, etc. This, however indicates that diversification per service has no guarantee for better efficiency. To verify the proposition of less diversified Islamic banks, we test the differences in the structure of the bank's income. Following Laeven and Levine (2007), we calculate the measure of income diversity as "*income diversity=1-(net interest income-other operating income / total operating income)".* This variable captures the degree to which banks diversify from traditional lending activities to other activities. 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. Consequently, the result of our simple calculations of diversification implies that conventional banks in general are much diversified than Islamic banks. For example but not limited, the average value of diversity measure during the period 2005-2006 for IBB is 10% whereas it is much higher for Bank of Beirut (UK) with about 43%.

[22] The predictor "personal expenses" shows an insignificant relationship with efficiency in all models. Strikingly, when we measure the effect of skills utilization on efficiency for all Islamic banks (small & large) which are operating in Muslim countries, analysis reveals a significant positive relationship with the efficiency scores ($t=2.868$, $p<0.01$). This indicates that there is a casual correlation between increased investment in labor and banks efficiency.

cially outperforming small Islamic banks from (GCC)-States and Malaysia. This could be partially due to the better diversification and/or economies of scale.

Financial results further illustrate that there is a slight difference in profitability, liquidity and leverage between the IBB and other banks in the sample. IBB is relatively superior in terms of lending intensity and capital adequacy, which enables the bank to offer more reasonable terms on loans, attain higher profitability, and ultimately gain a larger market shares over the inefficient banks. Empirical evidence from (ROE) tends to show that IBB has certainly an increasing trend in profitability in contrast to some of its conventional peers in same size, thanks to profit and loss sharing, making its profitability less volatile. "The main reason for such a difference is that Islamic banks benefit from a market imperfection, i.e. the availability of large amounts of non-remunerated deposits in their books, which considerably decrease the cost of funding" (Hassoune, 2001).

4.5.4. Correlation of DEA efficiency scores with financial performance

To examine the relationship between efficiency and profitability, we estimate the correlation coefficient between the two variables. We are interested in investigating whether the DEA results are consistent with the traditional accounting measures commonly used for comparing performance of Islamic banks. We first use ROA and ROE as measures of bank’s profits. We then calculate the "Spearman's rho" correlations, between the estimated DEA efficiency scores and the bank's profitability ratios, because it is an efficient estimator regardless of the distributions of variables. It also minimizes the effect of outliers on correlation coefficients. The null hypothesis states that the correlation coefficient between variables is zero.

It is clear from Table 4.3 below that the correlation coefficients of accounting measures are statistically and significantly different from zero in model-M1 and model-M2 (IBB, and small and large Islamic banks from Muslim-majority countries, respectively). This suggests that the efficiency measures are strongly associated with traditional accounting measures of performance in relation to the Islamic banking industry, and thus can easily be used by Islamic banks as a substitute of conventional accounting measures of performance. Such findings support Isik and Hassan, (2002) and Miller and Noulas (1996) who find that the most profitable banks are also the most efficient.

Table 4.3

The correlation coefficients between DEA $_{PTE}$ scores and accounting measures

Correlation matrix	The model	ROA	ROE
$DEA_{PTE\ (VRS)}$	M1	0.366*	0.346*
	M2	0.609**	0.546**
	M3	0.154	0.215
	M4	0.317*	0.050

**: Correlation is significant at the 0.05 level (2-tailed), **: Correlation is significant at the 0.01 level (2-tailed).*

In contrast, the accounting measures are found to be relatively statistically insignificant in model-M3 and model-M4 (small and large conventional banks in the UK, respectively). This indicates that the information contained in the standard accounting measures are not closely corresponded to that contained in efficiency measures in the UK conventional banking system. The main argument is that environmental factors could affect the attainment of profitability.

4.5.5. The efficiency – profitability matrix

In this analysis, we primarily focus on evaluating the performance of small Islamic and conventional banks based on an efficiency-profitability matrix (Table 4.4). The median value is used to split the matrix into two halves to create high and low groups of profitability (Luo, 2003), as measured by ROA, and efficiency scores as measured by DEA. We further split the matrix into four quadrants: stars, question marks, sleepers, and dogs.

Table 4.4

The efficiency – profitability matrix

Profitability (ROA):				
High	Sleeper	M1 :(N*=3 or 25%). M3 :(N=3 or 43%)	Star	M1 :(N=3 or 25%). M3 :(N=2 or 29%)
Low	Question Mark	M1 :(N=4 or 33%) **. M3: (N=1 or 14%) ***	Dogs	M1 :(N=2 or 17%). M3 :(N=1 or 14%)
DEA_{PTE}	**Low**		**High**	

** "N" represents the number of banks being tested in this matrix in each model (i.e. N_{M1}= 12, N_{M3}= 7) **including IBB *** IBB per se.*

The star quadrant consists of DMUs which exhibit a high level of profitability and efficiency and thus, considered as the flagship banks. The banks falling in sleeper category have high profitability but low efficiency which is not a good sign from long-term perspective. These sleeper banks are profitable due to primarily more favorable environmental conditions than good management. The question marks category has low profitability and low efficiency. They have a potential for greater efficiency and possibly greater profits. The dogs have a low profitability but high efficiency hence, they are efficient, but are still not profitable. They are efficiently operated units but low on profitability due to an unfavorable environment.

Our analysis suggests that the IBB falls in the question marks quadrant. This indicates that the bank has a low profitability and efficiency. Consequently, the market presence of IBB is week, the market growth is low and thus, is considered as under-performing but has the potential to maintain the business and to increase its operating efficiency by delivering enough cash. By and large, IBB is probably under-resourced and lacks appropriate skills. Thus, with a favorable environment and additional resources, it can be expected to enhance its efficiency and profitability performance. By increasing efficiency, the bank can possibly move to the "star" quadrant.

4.6. Conclusions

Results based on the extensive analysis in this chapter show that the IBB is technically inefficient. It has, on average, a poor and under-performing financial performance. IBB is also inefficient in exploiting the economies of scale given its scale of operations. It appears that the IBB inefficiency is driven, to a large extent, by inadequate management compared with small Islamic banks in Muslim-majority countries and small conventional banks from the UK. In comparison with large banks, either Islamic or conventional, the IBB relative inefficiency becomes largely due to the non-optimal size.

IBB, however, exhibits, in comparison to other Islamic banks, an increasing trend in efficiency performance over sample years due to small size and newness. IBB, as well as all small Islamic banks, tend also to have better financial performance than large Islamic banks mainly due to credit risk monitoring arrangements. Large conventional banks, on average, have an upward trend of estimated efficiency, generally with declining increments. Despite the prevailing market conditions being adverse, small Islamic banks (including IBB) and small conventional banks exhibit initially, compared to the large Islamic and conventional banks, poor efficiency scores which subsequently gradually increase with the passage of time. These results show that, with a favorable environment and additional resources, IBB has a substantial room for improvements to sustain its competitive edge in the banking industry by reducing costs and increasing revenues. However, IBB is, on average, better in utilizing its resources and controlling costs than generating optimal levels of revenues.

Overall, results suggest that the optimal size for the IBB to achieve better levels of efficiency performance is neither large nor small rather medium. The idea of medium-size banking has bloomed at the time of the current global crisis. Since then many small banks are becoming ac-

quisition candidates while large banks are more affected by the financial instability and thus recognized as a troublesome due to the high leverage and complex risk exposures.

Empirical findings further illustrate that the DEA-efficiency measures are highly correlated with ROA and ROE, and thus can be used separately or concurrently with the standard accounting measures of performance in determining the performance of Islamic banks in the UK (IBB) and in Muslim-majority countries. Although not widely used, DEA can be adopted along with financial ratios to make comparisons of performance more robust. However, there is an absence of such argument in the UK conventional banking system at which the information contained in the conventional financial measures are not closely corresponded to that contained in efficiency measures.

Eventually, overall results suggest that the banks with higher efficiency levels are larger in total assets (size), tend to exhibit higher profitability and loans intensity, on average acquire less levels of debt, and have relatively a smaller market share. IBB, however, is relatively superior in terms of lending intensity and capital adequacy.

Appendix-Ch.4

Table 4.5
Summary of the bank's DEA-efficiency scores in model (M1).

Year	Country	The bank*	crste	vrste	scale	rts
2005	UK	IBB	0.307	0.319	0.963	irs
2005	Qatar	Qatar International Islamic Bank	0.813	1.000	0.813	drs
2005	Bahrain	Khaleeji Commercial Bank	1.000	1.000	1.000	-
2005	Bahrain	Bahrain Islamic Bank	1.000	1.000	1.000	-
2005	Bahrain	Shamil Bank	0.453	0.497	0.912	drs
2005	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2005	U.A.E	Sharjah Islamic Bank	0.975	1.000	0.975	drs
2005	Kwuait	Boubyan Bank	0.893	0.898	0.994	drs
2005	Malaysia	RHB	0.790	0.793	0.995	irs
2005	Malaysia	CIMB	0.055	1.000	0.055	irs
2005	Turkey**	Albaraka Turk	0.621	0.761	0.816	drs
2005	Turkey	Kuveyt Turk	0.626	0.893	0.702	drs
2006	UK	IBB	0.285	0.306	0.931	drs
2006	Qatar	Qatar International Islamic Bank	1.000	1.000	1.000	-
2006	Bahrain	Khaleeji Commercial Bank	0.985	1.000	0.985	irs
2006	Bahrain	Bahrain Islamic Bank	0.596	0.614	0.970	irs
2006	Bahrain	Shamil Bank	0.591	0.625	0.946	drs
2006	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2006	U.A.E	Sharjah Islamic Bank	0.837	0.926	0.904	drs
2006	Kwuait	Boubyan Bank	0.806	0.841	0.959	drs
2006	Malaysia	RHB	0.991	1.000	0.991	drs
2006	Malaysia	CIMB	0.629	0.824	0.764	irs
2006	Turkey	Albaraka Turk	0.657	0.820	0.801	drs
2006	Turkey	Kuveyt Turk	0.691	0.986	0.701	drs
2007	UK	IBB	0.369	0.381	0.968	drs
2007	Qatar	Qatar International Islamic Bank	1.000	1.000	1.000	-
2007	Bahrain	Khaleeji Commercial Bank	1.000	1.000	1.000	-
2007	Bahrain	Bahrain Islamic Bank	0.635	0.671	0.947	drs
2007	Bahrain	Shamil Bank	0.658	0.706	0.932	drs
2007	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2007	U.A.E	Sharjah Islamic Bank	0.761	0.879	0.866	drs
2007	Kwuait	Boubyan Bank	0.721	0.858	0.840	drs
2007	Malaysia	RHB	0.612	0.845	0.724	drs
2007	Malaysia	CIMB	0.246	0.355	0.692	drs
2007	Turkey	Albaraka Turk	0.646	0.934	0.691	drs
2007	Turkey	Kuveyt Turk	0.629	0.948	0.663	drs
2008	UK	IBB	0.397	0.401	0.990	drs
2008	Qatar	Qatar International Islamic Bank	0.871	1.000	0.871	drs
2008	Bahrain	Khaleeji Commercial Bank	0.852	1.000	0.852	drs
2008	Bahrain	Bahrain Islamic Bank	0.522	0.758	0.689	drs
2008	Bahrain	Shamil Bank	0.811	1.000	0.811	drs
2008	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2008	U.A.E	Sharjah Islamic Bank	0.820	1.000	0.820	drs
2008	Kwuait	Boubyan Bank	0.671	0.981	0.684	drs
2008	Malaysia	RHB	0.585	0.863	0.678	drs
2008	Malaysia	CIMB	0.549	1.000	0.549	drs
2008	Turkey	Albaraka Turk	0.675	1.000	0.675	drs
2008	Turkey	Kuveyt Turk	0.626	1.000	0.626	drs
		Mean	0.709	0.844	0.847	

Table 4.6
Summary of the bank's DEA-efficiency scores in model (M2).

Year	Country	The bank	crste	vrste	scale	rts
2005	UK	IBB	0.326	1.000	0.326	irs
2005	Qatar	Qatar Islamic Bank	0.969	1.000	0.969	irs
2005	Kuwait	Kuwait Finance House	0.848	0.880	0.963	drs
2005	Bahrain	Albaraka Islamic bank Group	0.512	0.517	0.992	irs
2005	K.S.A	Bank Albilad	0.691	0.801	0.862	irs
2005	K.S.A	Al Rajhi Bank	1.000	1.000	1.000	-
2005	K.S.A	Aljazira	0.715	0.736	0.971	drs
2005	U.A,E	Emirates Islamic Bank	0.771	1.000	0.771	irs
2005	U.A.E	DIB	1.000	1.000	1.000	-
2005	Malaysia	Bank Islam(BIMB)	0.682	0.731	0.933	irs
2006	UK	IBB	0.321	0.658	0.488	irs
2006	Qatar	Qatar Islamic Bank	1.000	1.000	1.000	-
2006	Kuwait	Kuwait Finance House	0.741	0.816	0.908	drs
2006	Bahrain	Albaraka Islamic bank Group	0.590	0.593	0.995	irs
2006	K.S.A	Bank Albilad	0.512	0.536	0.956	irs
2006	K.S.A	Al Rajhi Bank	1.000	1.000	1.000	-
2006	K.S.A	Aljazira	1.000	1.000	1.000	-
2006	U.A,E	Emirates Islamic Bank	0.814	0.960	0.848	irs
2006	U.A.E	DIB	0.882	0.914	0.966	drs
2006	Malaysia	Bank Islam	0.513	0.547	0.938	irs
2007	UK	IBB	0.360	0.700	0.515	irs
2007	Qatar	Qatar Islamic Bank	0.956	1.000	0.956	irs
2007	Kuwait	Kuwait Finance House	0.969	1.000	0.969	drs
2007	Bahrain	Albaraka Islamic bank Group	0.641	0.648	0.989	drs
2007	K.S.A	Bank Albilad	0.469	0.480	0.978	irs
2007	K.S.A	Al Rajhi Bank	1.000	1.000	1.000	-
2007	K.S.A	Aljazira	0.448	0.487	0.920	drs
2007	U.A,E	Emirates Islamic Bank	0.774	0.825	0.939	irs
2007	U.A.E	DIB	0.831	0.854	0.973	drs
2007	Malaysia	Bank Islam	0.468	0.481	0.974	irs
2008	UK	IBB	0.394	0.869	0.453	irs
2008	Qatar	Qatar Islamic Bank	1.000	1.000	1.000	-
2008	Kuwait	Kuwait Finance House	0.834	1.000	0.834	drs
2008	Bahrain	Albaraka Islamic bank Group	0.592	0.618	0.958	drs
2008	K.S.A	Bank Albilad	0.460	0.467	0.984	irs
2008	K.S.A	Al Rajhi Bank	0.918	1.000	0.918	drs
2008	K.S.A	Aljazira	0.400	0.403	0.994	irs
2008	U.A,E	Emirates Islamic Bank	0.824	0.829	0.994	irs
2008	U.A.E	DIB	0.665	0.667	0.996	drs
2008	Malaysia	Bank Islam	0.450	0.456	0.986	irs
		Mean	0.709	0.787	0.905	

* (Crste) = Overall (total) efficiency scores, (Vrste) =Pure technical efficiency scores (Scale) =Scale efficiency, and (rts) =return to scale.
** All banks that have been chosen in the sample of Islamic banks, whether in GCC-States or in Malaysia, are from the top (50) Islamic banks as at 31/12/2007.
*** Geographically speaking, Turkey belongs to Europe. In recent years some sources consider Turkey to be more closely aligned with Europe based on their modern economic and political trends. However, Turkey has become increasingly integrated with the west through membership in organizations such as the Council of Europe, NATO, OECD, OSCE and the G-20 major economies.

Table 4.5.1
Summary of the DEA- slacks and targets (IBB: model-M1).

Year	output slacks		Input slacks			output targets		Input targets		
	1	2	1	2	3	1	2	1	2	3
2005	0.000	8.604	0.000	0.000	0.000	258.762	15.537	8.610	3.250	47.720
2006	0.000	9.272	0.000	1.276	0.000	345.925	18.872	11.580	2.874	82.200
2007	0.000	9.768	0.000	1.271	0.000	379.177	21.539	11.090	3.639	130.980
2008	0.000	12.362	0.000	0.000	0.000	366.840	24.374	10.000	4.460	146.100

Table 4.6.1
Summary of the DEA- slacks and targets (IBB: model-M2).

Year	output slacks		Input slacks			output targets		Input targets		
	1	2	1	2	3	1	2	1	2	3
2005	0.000	0.000	0.000	0.000	0.000	82.490	2.210	8.610	3.250	47.720
2006	0.000	5.784	1.102	0.000	0.000	161.046	10.254	10.478	4.150	82.200
2007	0.000	6.664	0.000	0.000	0.000	206.557	13.076	11.090	4.910	130.980
2008	0.000	3.279	0.000	0.000	7.510	169.345	8.824	10.000	4.460	138.590

Table 4.7
Summary of the bank's DEA-efficiency scores in model (M3)

Year	The bank	crste	vrste	scale	rts*
2005	IBB	1.000	1.000	1.000	-
2005	Turkish Bank (UK) Limited	893	0.916	0.975	irs
2005	ICBC London Limited	1.000	1.000	1.000	-
2005	Habib Allied INT. Bank Plc	0.873	0.905	0.966	drs
2005	Ghana INT. Bnak	1.000	1.000	1.000	-
2005	Bank of Beirut(UK)Ltd	0.964	1.000	0.964	irs
2005	Bank Leumi UK	0.896	0.993	0.902	drs
2006	IBB	0.825	0.901	0.916	drs
2006	Turkish Bank (UK) Limited	0.860	0.878	0.980	irs
2006	ICBC London Limited	0.990	1.000	0.990	irs
2006	Habib Allied INT. Bank Plc	0.906	0.948	0.955	drs
2006	Ghana INT. Bnak	1.000	1.000	1.000	-
2006	Bank of Beirut(UK)Ltd	0.670	0.899	0.746	irs
2006	Bank Leumi UK	0.949	1.000	0.949	drs
2007	IBB	0.815	0.898	0.908	drs
2007	Turkish Bank (UK) Limited	0.860	0.860	1.000	-
2007	ICBC London Limited	1.000	1.000	1.000	-
2007	Habib Allied INT. Bank Plc	0.938	0.978	0.959	drs
2007	Ghana INT. Bnak	1.000	1.000	1.000	-
2007	Bank of Beirut(UK)Ltd	0.774	0.847	0.913	irs
2007	Bank Leumi UK	0.964	1.000	0.964	drs
2008	IBB	0.789	0.856	0.922	drs
2008	Turkish Bank (UK) Limited	0.947	0.997	0.949	irs
2008	ICBC London Limited	1.000	1.000	1.000	-
2008	Habib Allied INT. Bank Plc	0.938	0.977	0.960	drs
2008	Ghana INT. Bnak	0.884	1.000	0.884	drs
2008	Bank of Beirut(UK)Ltd	1.000	1.000	1.000	-
2008	Bank Leumi UK	0.973	1.000	0.973	drs
	Mean	0.918	0.959	0.956	

Table 4.7.1
Summary of the DEA slacks and targets (IBB: model-M3)

Year	output slacks		Input slacks			output targets		Input targets		
	1	2	1	2	3	1	2	1	2	3
2005	0.000	0.000	0.000	0.000	0.000	82.490	2.210	8.610	3.25	47.7
2006	0.000	0.000	2.71	0.986	0.000	117.641	3.265	8.870	3.164	82.2
2007	0.000	0.000	2.211	1.861	0.000	161.002	4.998	8.879	3.049	131
2008	0.000	0.000	1.259	1.443	0.000	171.945	5.630	8.741	3.017	146

Table 4.8
Summary of the bank's DEA-efficiency scores in model (M4)

Year	The Bank	crste	vrste	scale	rts
2005	IBB	0.354	1.000	0.354	irs
2005	The Royal Bank of Scotland	0.476	0.946	0.503	drs
2005	National Westminster Bank	0.636	0.667	0.953	drs
2005	Lloyds TSB Bank plc	1.000	1.000	1.000	
2005	Bank of Scotland plc	1.000	1.000	1.000	
2005	HBOS plc	1.000	1.000	1.000	
2005	Standard Chartered	0.445	0.517	0.861	drs
2005	Northern Rock plc	0.926	0.927	0.998	irs
2005	HSBC bank Plc	0.436	0.705	0.618	drs
2005	Abbey National	0.397	0.634	0.626	drs
2005	Alliance and Leicester	0.591	0.593	0.997	irs
2005	Barclays PLC	0.442	0.791	0.559	drs
2005	The Co-operative Bank Plc	0.467	0.474	0.984	irs
2005	Bradford and Bingley	0.725	0.736	0.986	irs
2006	IBB	0.269	0.434	0.619	irs
2006	The Royal Bank of Scotland	0.479	0.954	0.502	drs
2006	National Westminster Bank	0.625	0.937	0.667	drs
2006	Lloyds TSB Bank plc	0.907	1.000	0.907	drs
2006	Bank of Scotland plc	1.000	1.000	1.000	
2006	HBOS plc	1.000	1.000	1.000	
2006	Standard Chartered	0.443	0.511	0.868	drs
2006	Northern Rock plc	1.000	1.000	1.000	
2006	HSBC bank Plc	0.432	0.737	0.586	drs
2006	Abbey National	0.456	0.699	0.652	drs
2006	Alliance and Leicester	0.619	0.620	0.997	irs
2006	Barclays PLC	0.487	0.807	0.603	drs
2006	The Co-operative Bank Plc	0.557	0.575	0.969	irs
2006	Bradford and Bingley	0.734	0.743	0.988	irs
2007	IBB	0.254	0.413	0.616	irs
2007	The Royal Bank of Scotland	0.504	1.000	0.504	drs
2007	National Westminster Bank	0.640	1.000	0.640	drs
2007	Lloyds TSB Bank plc	0.802	0.965	0.831	drs
2007	Bank of Scotland plc	0.982	1.000	0.982	drs
2007	HBOS plc	0.983	1.000	0.983	drs
2007	Standard Chartered	0.448	0.535	0.838	drs
2007	Northern Rock plc	1.000	1.000	1.000	
2007	HSBC bank Plc	0.463	0.762	0.608	drs
2007	Abbey National	0.528	0.781	0.676	drs
2007	Alliance and Leicester	0.577	0.578	1.000	
2007	Barclays PLC	0.467	0.855	0.547	drs
2007	The Co-operative Bank Plc	0.404	0.410	0.986	irs
2007	Bradford and Bingley	0.712	0.721	0.988	irs

Year	The Bank	crste	vrste	scale	rts
2008	IBB	0.255	0.624	0.409	irs
2008	The Royal Bank of Scotland	0.329	1.000	0.329	drs
2008	National Westminster Bank	0.602	1.000	0.602	drs
2008	Lloyds TSB Bank plc	0.347	0.885	0.392	drs
2008	Bank of Scotland plc	0.912	1.000	0.912	drs
2008	HBOS plc	0.862	0.986	0.874	drs
2008	Standard Chartered	0.474	0.598	0.793	drs
2008	Northern Rock plc	0.738	0.738	1.000	drs
2008	HSBC bank Plc	0.523	0.809	0.647	drs
2008	Abbey National	0.623	0.999	0.623	drs
2008	Alliance and Leicester	0.339	0.502	0.675	drs
2008	Barclays PLC	0.458	0.964	0.475	drs
2008	The Co-operative Bank Plc	0.429	0.434	0.987	irs
2008	Bradford and Bingley	0.989	1.000	0.989	irs
	Mean	0.617	0.796	0.780	

Table 4**.8.1**
Summary of the DEA- slacks and targets (IBB: model-M4)

Year	output slacks		Input slacks			output targets		Input targets		
	1	2	1	2	3	1	2	1	2	3
2005	0.000	0.000	0.000	0.000	0.000	82.490	2.210	8.610	3.250	47.720
2006	0.000	0.000	0.000	0.482	0.000	243.871	6.768	11.580	3.668	82.200
2007	0.000	0.000	0.000	0.453	0.000	350.341	10.876	11.090	4.457	130.980
2008	0.000	0.000	0.000	0.478	31.931	236.056	7.730	10.000	3.982	114.169

Table 4.9
Summary results of the regression analysis.

The Model- Coefficients and t- statistics				
	M1	**M2**	**M3**	**M4**
ISLAM-dummy	_	_	B= -.175 t= -3.583**	_
Bank's size -Log. assets	_	B = .237 t = 3.558 ***	B=1.100 t = 4.414***	B=.621 t = 4.644***
Bank's leverage	_	B = -.183 t= -2.290*	B=0.076 t=1.777****	B=-.575 t = - 4.009***
Bank's region	B = -.158 t = -1.708****	B = -.473 t = 3.221***	_	_
Bank's market share	_	B = -.276 t= -3.437**	B=-1.090 t = - 4.369***	B=-.330 t = - 2.384*
Bank's loans intensity	_	B = .320 t = 1.755****	_	B=.339 t= 1.842****
Dependency/In. Factor	_	_	B=-.045 t=-1.948 ****	B=-.136 t=-2.596*
Bank's liquidity	_	B=-.514 t=-4.267***	_	_
Bank's ROE/ ROA	B= 4.685 t=2.564*	B=.365 t=4.484***	_	B=-.154 t=-3.052**

*: significant at the 0.05 level-p<.05 (2-tailed), **: significant at the 0.01 level-p<.01 (2-tailed),

: significant at the 0.001 level (2-tailed) p<0.1%, *: significant at the 0.10 level-p<.10 (2-tailed)

Note: For the sake of parsimony, the table displays only the estimated "Beta" and the "t" values.

Table 4.10
Summary statistics of the variables employed in DEA

All numbers are expressed in million £ after deflation.					
Outputs-inputs	N	Minimum	Maximum	Mean	Std. Deviation
M1					
Total Loans	48	0.440	1,567.810	596.770	414.086
Total Revenues	48	0.580	263.530	69.251	58.834
Total Expenses	48	3.810	16,768.770	388.629	2,415.026
Total Staff Cost	48	0.900	698.570	24.998	99.656
Total Deposits	48	2.700	3,172.440	761.526	598.330
M2					
Total Loans	40	82.490	22,668.570	4,237.159	5,050.672
Total Revenues	40	2.210	1823.300	411.548	494.508
Total Expenses	40	8.61	1005.16	152.464	194.139
Total Staff Cost	40	3.250	253.120	61.228	57.989
Total Deposits	40	47.720	19,682.360	4,223.458	4,589.773
M3					
Total Loans	28	29.400	1,278.720	298.965	354.175
Total Revenues	28	2.211	38.110	10.927	10.700
Total Expenses	28	1.510	19.600	7.089	5.446
Total Staff Cost	28	0.850	10.710	3.494	2.722
Total Deposits	28	47.720	1,214.390	323.312	348.269
M4					
Total Loans	56	105.940	644,732.470	20,3774.686	1.730
Total Revenues	56	2.940	53,775.550	12,522.143	14,615.558
Total Expenses	56	10.000	39,902.580	7,919.875	10,505.427
Total Staff Cost	56	4.150	8,027.700	2,109.719	2,234.654
Total Deposits	56	82.200	585,895.760	175,343.687	1.571

Table 4.11
Correlation matrix between inputs and outputs.

The model	Revenue	T. Expenses	T. staff Cost	T. Deposits
M1				
T. Loans	0.767	0.631	0.524	0.799
T. Revenues	1.000	0.813	0.726	0.753
T. Expenses		1.000	0.502	0.776
T. Staff Cost			1.000	0.545
M2				
T. Loans	0.896	0.928	0.934	0.854
T. Revenues	1.000	0.890	0.900	0.798
T. Expenses		1.000	0.939	0.833
T. Staff Cost			1.000	0.827
M3				
T. Loans	0.799	0.638	0.651	0.845
T. Revenues	1.000	0.546	0.587	0.971
T. Expenses		1.000	0.937	0.497
T. Staff Cost			1.000	0.533
M4				
T. Loans	0.920	0.937	0.874	0.959
T. Revenues	1.000	0.966	0.839	0.881
T. Expenses		1.000	0.853	0.912
T. Staff Cost			1.000	0.933

Correlation is significant at the 0.01 level (2-tailed)

Table 4.12
Summary of the exogenous variables used in DEA- 2 stage.

Exogenous variables	The measurement and *the expected* effect on efficiency
β1BP_{jt} (E1,E2)	Profitability= net income to total assets. (+)*
β 2Per_{jt} (E1,E2)	Personal expenses as a proxy of skills utilization measured by total amount of wages and salaries to total assets. (-): efficient banks are expected to have lower cost because of IT.
β 3Liq_{jt} (E1,E2)	Liquid assets to total deposits and short term funding as a proxy of liquid asset ratio. (+ or -)
β 4 $Log(A)_{jt}$ (E1,E2)	The logarithm of total assets as a proxy of size. (+)
β 5LTA_{jt} (E1,E2)	The proxy of lending intensity= total Loans to total asset. (+): loans are the main source of revenue.
β 6 $Depo_{jt}$ (E1,E2)**	Total deposits as a proxy of banks market share. (+): deposits are considered the main source of banks progress.
β 7 Ind_{jt} (E1,E2)***	The effect of independency. Dummy variable; (1) if a bank is managed by parents (subsidiary), (0) if it is stand alone bank. (+ or -)
β8 Age_{jt} (E1,E2)****	The effect of age and experience. Dummy variable; (1) if <10 years, (0) otherwise. (+)
β 9Lev_{jt} (E1,E2)	Financial leverage= total assets to equity. (-)
β10GDP_{jt} (E1)	The percentage change in gross domestic production per capita (favorable economic condition will affect positively on demand and supply of banking services). (+ or -)
β 10$Diver_{jt}$ (E2)	Diversification effect. Dummy variable; (1) if high diversified, (0) otherwise. (+): Unless it leads to higher risk.
β11Geo_{jt} (E1)	Geographical location effect. Dummy variable; (1) if the bank is located in Europe; = (0) otherwise. (+): Islamic banks in Muslim countries are more Efficient.
β12$Islam_{jt}$ (E2)	Dummy variable; (1) if an Islamic bank; = (0) otherwise. (+ or -)

* (+) indicates a positive effect, (-), negative effect, while (0) (No) effect.
** The market share of a bank is measured by dividing the amount of its deposits by the total amount of all sample bank's deposits in a local market. The sample banks represent the majority of major banks deposits in a banking industry.
*** The term dependency means: a) Islamic banks managed by conventional banks. b) Banks operate as subsidiary or a member (part) of a banking group. While independent banks are those "stand alone banks".
**** We introduced (5) dummies to avoid the *dummy trap* in order to get away from the perfect multi co-linearity. However, the number of dummy variables is not important, what matter is whether the sum of any of the dummies is the same for all observations.

Table 4.13
Results from testing the "OLS" main assumptions

The assumption	The test	The results of our analysis
Non-Multicolinearity	- Tolerance	T >0.20
	- Variance –Inflation Factor	VIF≤ 4
	- Durbin-Watson	D-W ≈ 2 (P >0.05*)
Normality**	Skewness	Skew is within the range (+1 to -1)
Linearity	Scatter-Plots	Certainly been met

Model results

1. R^2 > 56% (M1=56.7%; M2=67.5%; M3=73.9%; and M4=62.8%), this illustrate a strong correlation between the observed value of the response variable and the values predicted by the model.

2. ANOVA*** M1, $F_{12,35}$=3.825, *P*<.01; M2, $F_{11,\ 28}$ = 5.297, *P*<.001; M3, $F_{11,\ 16}$=4.128, *P*<.001; M4, $F_{10,45}$=7.608, *P*<.001

* The *p*-value tests for serial correlation. Since the *p*-value is greater than 0.05, then there is no serial correlation and the data are fine.

** Despite the fact that the multiple regression procedures are not greatly affect by minor deviations from the assumptions of *linearity and normality* of data, and to produce more accurate results, we use the *nonlinear transformation* to meet the foregoing assumptions.

***we clearly reject the null hypothesis and conclude that at least one of the predictors is related to the efficiency scores. This means that the models that have been estimated are theoretically construct and statistically significant.

Additional notes:

I. In order to get rid the negative values for variables in the regression analysis, we add a constant to move the minimum value of the distribution above 0. Hence, we use *log+4* in our analysis to transfer the logarithms results to a positive numbers. Furthermore, for the original data values include negative number, it is not possible to apply many nonlinear transformations, in this situation we add a constant to all data values that make them positive, as a rule of thumb, we add the smallest constant that will convert the largest negative data value to a value greater than1.

II. It is worth noting that the DEA model requires the input and output data to be non-negative and preferably strictly positive (no zero value), therefore, it is necessary to transfer the negative data into positive one. One of the more common methods for eliminating this problem has been through the addition of a sufficiently large positive constant to the values of the input or output that has the negative number (Ali and Seiford, 1990).

III. Formally, DEA is a methodology directed to frontiers rather than central tendencies. In contrast to regression methods, DEA focuses on individual observations and optimizes the performance measure of each unit. A prior knowledge of weights or prices for inputs and outputs is not required in DEA.

Table 4.14

Summary statistics for the "Mean" values of the independent variables used in the regression analysis (2005-08)

Individual/Group banks	ROE	ROA	Personal Expenses	Liquidity	Lending Intensity	Capital Adequacy	Leverage
IBB - the U.K	0.257	0.055	0.406	1.263	0.911	0.245	5.527
Islamic Banks in Malaysia	0.057	0.004	0.219	0.687	0.403	0.157	13.187
Islamic Banks in Turkey	0.179	0.020	0.170	0.534	0.730	0.110	9.294
Islamic Banks in (GCC) Countries	0.258	0.048	0.476	2.842	0.683	0.225	5.790
MEAN: Islamic Banks*	0.165	0.024	0.289	1.354	0.605	0.164	9.424
MEAN - Small Islamic Banks *	0.149	0.029	0.347	0.988	0.614	0.237	6.814
MEAN - Large Islamic Banks	0.323	0.054	0.481	0.721	0.685	0.162	7.783
Conventional Banks: the U.K	0.446	0.090	0.459	0.762	0.685	0.109	24.365
MEAN -Small Conventional Banks	0.889	0.178	0.540	0.949	0.714	0.186	7.877
MEAN -Large Conventional Banks	0.002	0.002	0.377	0.575	0.655	0.031	40.854**

** Only from Muslim countries. **this amount means the bank has £40.854 of assets for every £1 of common equity. With leverage of 40.854, if the value of those assets were to fall, then common stockholders are wiped out. This means the need of more (£) in tangible common equity to absorb losses stemming from what is essentially an over-leveraged financial system.*

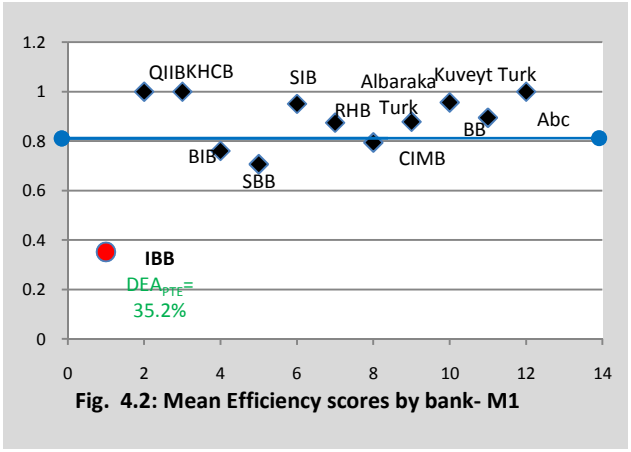


Fig. 4.2: Mean Efficiency scores by bank- M1

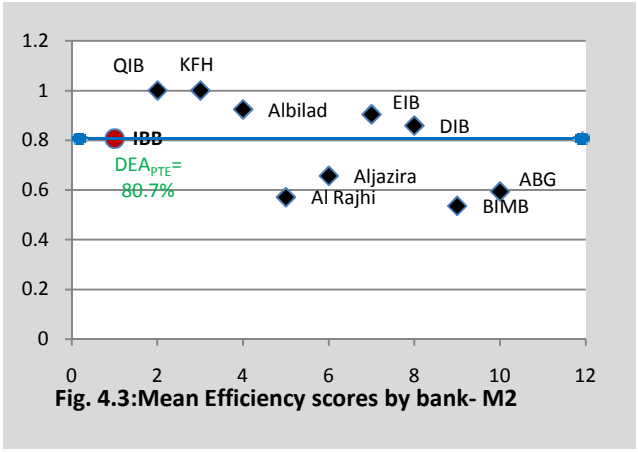


Fig. 4.3:Mean Efficiency scores by bank- M2

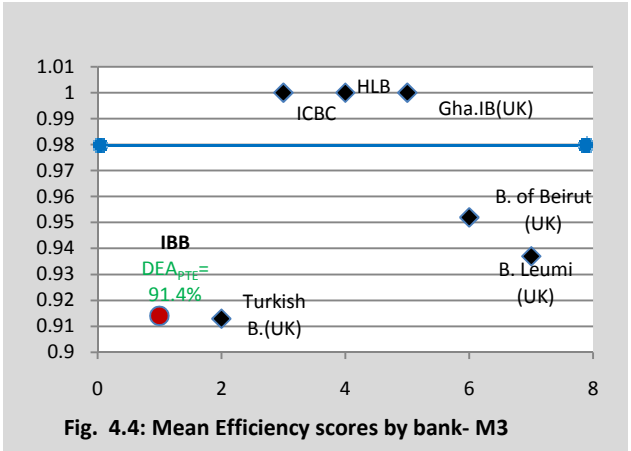


Fig. 4.4: Mean Efficiency scores by bank- M3

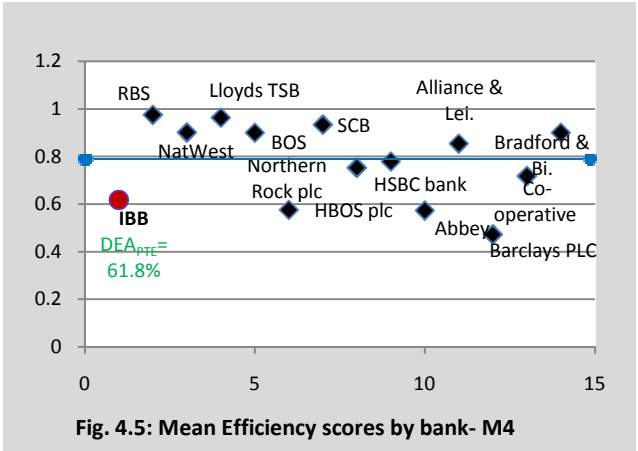


Fig. 4.5: Mean Efficiency scores by bank- M4

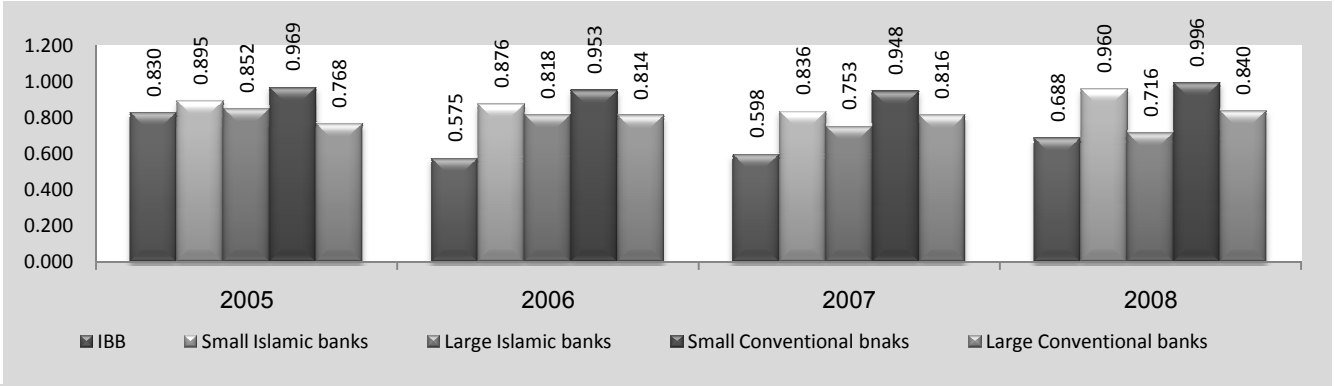


Fig. 4.6: Mean DEA_{PTE} scores by group bank within the sample period

References

Ali A.I., and Seiford L.M. (1990) 'Translation Invariance in Data Envelopment Analysis', Operations Research Letters, Vol. 9, No.5, pp. 403-405.

Alirezaee, M., Howland, M., and vandePanne, C. (1998) 'Sampling size and efficiency bias in data envelopment analysis', Journal of Applied Mathematics & Decision Sciences, Vol. 2, No.1, pp. 51-64.

Banker, R.D., Charnes, A., and Cooper, W.W. (1984) 'Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis', Management Science, Vol. 30, No.9, pp. 1078-92.

Bauer, P., Berger, A., Ferrier, G. y. and Humphrey, D. (1998) 'Consistency Conditions for Regulatory Analysis of Financial Institutions: A Comparison of Frontier Efficiency Methods', Journal of Economics and Business, Vol. 50, No. 2, pp. 85-114.

Berger, A. N., Hancock, D., and Humphrey, D. B. (1993) 'Banking efficiency derived from the profit function', Journal of Banking and Finance, Vol.17, No. 2-3, pp. 317-347.

Berger, A.N., and Humphrey, D.B. (1997) 'Efficiency of Financial Institutions: International Survey and Directions for Future Research', European Journal of Operational Research, Vol. 98, No.2, pp. 175-212.

Casu, B., and Molyneux, P. (2003) 'A Comparative Study of Efficiency in European Banking', Applied Economics, Vol. 35, No.17, pp. 1865-1876.

Charles W. Cobb., and Paul H. Douglas. (1928) 'A Theory of Production. American Economic Review, Vol.18, No. 1, pp. 139-165.

Charnes, A., Cooper, W.W., and Rhodes, E. (1978) 'Measuring the efficiency of decision making units', European Journal of Operational Research, Vol. 2, No.6, pp. 429–444.

Čihák, M., and Hesse, H. (2008) 'Islamic Banks and Financial Stability: An Empirical Analysis', International Monetary Fund Working Paper no. 08/16, available at: http://www.imf.org/external/pubs/ft/wp/2008/wp0816.pdf (accessed 20 Feb. 2011).

Coelli T.J. (1996) 'A guide to DEAP Version 2.1: A Data Envelopment Analysis (Computer) Program', Centre for Efficiency and Productivity Analysis (CEPA) WP no. 96/08, available at: http://www.owlnet.rice.edu/~econ380/DEAP.PDF (accessed 20 Sep. 2010).

Coelli, T.J., Prasada Rao, D.S., O'Donnell, C.J., and Battese, G.E. (2005) 'An Introduction to Efficiency and Productivity Analysis, Springer Science & Business Media, Inc, New York.

Cooper, W. W., Seiford, L. M., and Tone, K. (2006) 'Introduction to Data Envelopment Analysis and its uses, with DEA-Solver software and references, Springer, New York.

Cooper, W. W., Seiford, L. M., and Tone, K. (2007) 'Data Envelopment Analysis: A comprehensive Text with Models, Applications, References and DEA-Solver Software, Springer, New York.

Cubbins, J., and Tzanikadis, G. (1998) 'Regression versus Data Envelopment Analysis for efficiency measurement: An application to the England and Wales regulated water industry', Utilities Policy, Vol.7, No. 2, pp. 75-85.

Darrat, F., Topuz, C., and Yousef, T. (2002) 'Assessing Cost and Technical Efficiency of Banks in Kuwait', Presentation to the Economic Research Forum's 8th Annual Conference in Cairo (January), available at: http://www.erf.org.eg/CMS/uploads/pdf/1194082688_Assessingcost-Darrat&Yousef.pdf (accessed 14 Feb.2011).

Farrell, M.J. (1957) 'The Measurement of Productive Efficiency. Journal of the Royal Statistical Society, Vol. 120, No. 3, pp. 253-290.

Gorton, G., and Winton, A. (1998) 'Banking in transition economies: Does Efficiency Require Instability? Journal of Money, Credit and Banking, Vol. 30, No. 3, pp. 621-650.

Hassoune, A. (2001) 'Islamic Banks Profitability in an Interest rate cycle', International Journal of Islamic Financial Services, Vol. 4, No.2.

Iqbal, M., and Molyneux, P. (2005) 'Thirty Years of Islamic Banking: History, Performance and Prospects, Palgrave Macmillan, New York.

Isik, I., and Hassan, M.K. (2002) 'Technical, Scale and Allocative Efficiencies of Turkish Banking Industry', Journal of Banking and Finance, Vol. 26, No. 4, pp. 719-766.

Jensen, M., and Meckling, W. (1976) 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure', Journal of Financial Economics, Vol. 3, No. 4, pp. 305-360.

Jensen, M.C. (1986) 'Agency costs of free cash flow, corporate finance, and take-overs', American Economic Review, Vol. 76, No. 2, pp. 323-329.

Jobst, A. (2007) 'The Economics of Islamic Finance and Securitization', IMF Working Paper No. 07/117, Washington: International Monetary Fund. Available at: http://www.imf.org/external/pubs/ft/wp/2007/wp07117.pdf (accessed 14 Feb.2010).

Kamaruddin, H., Safa, S., Mohd, R. (2008) ' Assessing production efficiency of Islamic banks and conventional banks Islamic windows in Malaysia', MPRA, paper no. 10670. Available at: http://mpra.ub.uni-muenchen.de/10670/1/Badrul_31-48.pdf (accessed 18Feb.2009).

Kapelko, M., Prior-Jimènez, D., and Rialp-Criado, J. (2008) 'Intangible assets and efficiency. International analysis in the textile and apparel industry. Ph.D. Dissertation, Universitat Autònoma de Barcelona, Spain. Available at: http://tdx.cat/bitstream/handle/10803/3972/mmk1de1.pdf?sequence=1

Kumbhakar, S.C., and Lovell, C.K. (2000) 'Stochastic Frontier Analysis, Cambridge University Press, Cambridge.

Laeven, Luc, and Levine, Ross. (2007) 'Is there a diversification discount in financial conglomerates? ', Journal of Financial Economics, Elsevier. Vol. 85, No. 2, pp. 331-367.

Limam, I. (2001) 'Measuring Technical Efficiency of Kuwait Banks', API-Working Paper Series 0101, Arab Planning Institute - Kuwait, Information Center. Available at: http://www.arab-api.org/wps/wps0101.htm (accessed 23 March. 2011)

McDonald, J. (2009) 'Using least squares and tobit in second stage DEA efficiency analyses', European Journal of Operational Research, Vol.197 No.2, pp.792-798.

Metwally, M.M. (1997) 'Differences between the Financial Characteristics of Interest- Free Banks and Conventional banks', European Business Review, Vol. 97, No. 2, pp. 92-98.

Miller S., and Noulas, A. (1996) 'The Technical Efficiency of Large Banks Production', Journal of Banking and Finance, Vol. 20, No. 3, pp. 495-509.

Pedraja-Chaparro F, Salinas-Jimenez J, and Smith P. (1999) 'On the quality of data envelopment analysis', Journal of Operational Research Society, Vol. 50, pp. 636–44

Lønborg, R. (2005) 'Regulation, Organization and Efficiency: Benchmarking of Publicly and Privately Owned Utility Companies', The 3rd ECPR Conference, Budapest 8th-10th of Sep. Available at: http://regulation.upf.edu/ecpr-05-papers/rlonborg.pdf (accessed 29 May. 2010)

Rosly, S.A., and Abu Bakar, M.A. (2003) 'Performance of Islamic and Mainstream Banks in Malaysia', International Journal of Social Economics, Vol. 30, No.12, pp. 1249-1265.

Samad, A. (2004) 'Performance of Interest-Free Islamic Banks vis-a-vis Interest-Based Conventional Banks of Bahrain', IIUM Journal of Economics and Management, Vol. 12, No. 2, pp.1-15

Samad, A., and Hassan, K. (1999) 'The Performance of Malaysian Islamic Bank during 1984-1997: An Exploratory Study', International Journal of Islamic Financial Services, Vol. 1 No. 3.

Sole, J. (2007) 'Introducing Islamic Banks into Conventional Banking Systems', IMF-WP07/175, available at: http://www.imf.org/external/pubs/ft/wp/2007/wp07175.pdf (accessed 2 Feb. 2010).

Sufian, F (2007) 'The efficiency of Islamic banking industry: A non-parametric analysis with non-discretionary input variable', Islamic Economic Studies, Vol. 14, No. 1 & 2, pp. 53-78.

Sufian, F., A., Majid A., and M., Zulkhibri (2008) 'Bank Ownership, Characteristics, and Performance: A Comparative Analysis of Domestic and Foreign Islamic Banks in Malaysia', J.KAU: Islamic Econ., Vol. 21, No. 2, pp. 3-37

Sundararajan, V., and Errico, L. (2002) 'Islamic Financial Institutions and Products in the Global Financial System: Key Issues in Risk Management and Challenges Ahead', IMF Working Paper No. 02/192. Washington: International Monetary Fund.

Yang, Z. (2009) 'Bank Branch Operating Efficiency: A DEA Approach', Proceedings IMECS. Vol. II. Available at: http://www.iaeng.org/publication/IMECS2009/IMECS2009_pp2087-2092.pdf (accessed 6 May. 2011).

Yudistira, D. (2004) 'Efficiency of Islamic Banks: an Empirical Analysis of 18 Banks', Islamic Economic Studies. Vol. 12, No. 1, August.

Chapter 5

Empirical Analysis: Part-2 /*Jointly with Burghof, H-P. & Khan, W.*

Comparison of Efficiency and Productivity Changes of Islamic and Conventional Banks: Evidence from Europe and Muslim-Majority Countries

"Adopted with permission from the Clute Institute-JABR, Wed, 6 Jun 2012"

5.1. The abstract

In this chapter we examine the efficiency performance of Islamic Bank of Britain (IBB) in the UK and Bosna Bank International (BBI) in Bosnia-Herzegovina, relative to small conventional banks in each country and also against Islamic banks from Muslim-majority countries. We also estimate the productivity changes of both banks relative to small Islamic banks, within and outside Europe, and also relative to small conventional banks in the UK and Bosnia respectively. We eventually conduct the two-stage DEA analysis to check the robustness of the results obtained from DEA and also to determine the impact of internal and external factors on bank's efficiency. Our analysis covers the 4-year period from 2005 to 2008.

Our findings suggest that the IBB and BBI are technically inefficient. The bank's inefficiency stems from both scale (size) and management issues. As compared to Islamic banks from Muslim countries, BBI yields higher pure technical efficiency than IBB, but IBB records higher positive growth in efficiency performance. IBB and BBI yield positive growth (progress) in total factor productivity and technical efficiency but record negative growth (regress) in technology innovations. Findings also suggest that the IBB and BBI lag far behind their conventional counterparty banks in terms of both efficiency and productivity performance. BBI shows much better efficiency performance relative to conventional banks than IBB. Overall, results show that a bank that is more efficient is found to be larger, more profitable, acquire less debt, invest more in skills, and operate in countries with a higher GDP-per capita.

5.2. Introduction

The efficiency and productivity of banks have been widely studied in the literature. For banks, efficiency implies improved profitability, large deposits (funds), better prices, quality services and greater safety in terms of improved capital buffer in absorbing risk (Berger, Hunter, and Timme, 1993). Hence, the information obtained from the evaluation of the bank's performance may be used to improve its efficiency as well as to increase productivity. Overall, the analysis of banks' performance is important for European banking where Islamic banks are operating in parallel with conventional banks. Measuring the efficiency and/or productivity of Islamic banks in Europe provides evidence on the performance of Islamic banks as compared to European counterparties-conventional banks. It further contributes towards examining the validity, stability and viability of Islamic banking in a system that is driven by conventional regulations. This could also make European banks perceive Islamic banking as a profitable opportunity to generate new business rather than as a threat to existing business taking into consideration the uncomfortable opinion of some non-Muslims on Islamic values and principles.

Islamic banking is a worldwide phenomenon involving a variety of instruments. Previously, Islamic transactions and institutions made up a small part of the total banking industry. Recently, Islamic banks have significantly expanded their network and have been able to mobilize large amount of funds and upgrade many economic ventures. Given the differential behavior of the Islamic banks and the conventional banks[1], there has been a question about the long run sustainability of Islamic banks, which in turn depends heavily on their economic efficiency. A bank is considered to be economically efficient if it exhibits technical efficiency. A bank is technically efficient if it produces the maximum output from a given set of inputs (Yotopoulos and Lau 1973).[2]

Despite the considerable development of the Islamic banking sector, there are still few studies that focus on the efficiency and productivity growth of Islamic banks, particularly in Europe. Past studies concentrated primarily on conceptual issues. In this chapter, our primary contribution is to offer a comprehensive analysis of the efficiency and productivity changes of Isl-

[1] Islamic banking is a form of banking based on Islamic principles. Basically, Islamic banking does not allow the paying and/or receiving of interest. It is based on profit and loss sharing. Islamic banks must avoid heavy debt, excessive uncertainty, speculation, and socially and ethically detrimental activities. In Islamic banking, money itself has no intrinsic value; it is simply a medium of exchange. Each financial transaction in Islamic banks must also be tied to a tangible underlying asset.

[2] 'When two banks produce the same amount of output but bank (A) uses less inputs than bank (B), bank (A) is said to be more efficient, from the technical efficiency point of view. Alternatively, if (A) and (B) use the same amount of inputs but (A) manages to produce more output, then, too, it is more technically efficient' (La Forgia and Couttolenc, 2008).

amic banking in Europe. We intend to identify financial and policy indicators that impact performance of Islamic banks. Due to the short history of Islamic banking in Europe and consequently lack of sufficient data, we utilize a sample period of 4-years, 2005 (2 years pre-crisis of 2007) through 2008, to examine the relative efficiency performance of the first and only Islamic commercial banks in Europe i.e. Bosna Bank International (BBI) in Bosnia – Herzegovina (BiH), and Islamic Bank of Britain (IBB) in the UK. More specifically, we compare their efficiency performance with small conventional banks in each country, on the one hand, and with small and large Islamic commercial banks from Gulf Cooperation Council (GCC)-States (i.e. Bahrain, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, and Oman), Malaysia, Turkey and Azerbaijan, on the other hand. We further aim to measure the productivity changes of IBB and BBI in relation to small Islamic banks, within and outside the Muslim-majority countries, and also relative to small conventional banks in the UK and BiH, respectively.

We *first* employ the non-parametric (DEA) technique to estimate the relative efficiency scores for Islamic and conventional banks over the sample period 2005-2008. *Second*, in order to measure the changes in productivity, we apply the Malmquist-DEA method to calculate the Malmquist Total Factor Productivity (TFP) indices. *Third*, the DEA-efficiency scores obtained from the first stage are used as dependent variables in the Ordinary Least-Squares (OLS) regression analysis in order to examine the effects of the environmental factors (variables that are neither considered inputs nor outputs such as: the bank's size and region, etc.) on each banks' performance. OLS is also utilized to check the robustness of the overall results obtained from DEA scores. Such an analysis is important both from operational as well as academic viewpoints. It displays the expansion potential for Islamic banks in a hybrid banking system, as well as showing guidelines implications for Islamic banks on how to improve efficiency and productivity growth.

The rest of the chapter is organized as follows: Section 2 reviews the literature. Section 3 discusses the methodology and calculations of DEA first stage of analysis as well as calculations for the Malmquist index. It further considers the DEA-second stage analysis. Section 4 presents the empirical results. Finally, section 5 contains the concluding remarks.

5.3. Literature review

The literature on the comparative efficiency and productivity, particularly in the area of conventional banking, comprises a large number of papers. Likewise, the literature on Islamic finance has grown recently, reflecting the increased role of Islamic banking particularly in Muslim countries. The bulk of the academic work in the area of Islamic banking is related to comparisons of the instruments used by Islamic and conventional banks and the regulatory and supervisory challenges related to Islamic banking, e.g. Omar, Abdul Rahman, Yusof, Abd. Majid and Rasid (2006), Sole (2007), and Abdul-Majid, Saal and Battisti (2008).

Empirically speaking, Hussein (2003) examines the cost efficiency of Islamic banks in Sudan between 1990 and 2000. Using the stochastic cost frontier approach, Hussein estimates cost efficiency for a sample of 17 banks. The results show large variations in the cost efficiency of Sudanese banks, with state owned banks the most cost inefficient, while the smaller banks are more efficient than their larger counterparts, and the foreign owned banks are the most efficient.

Hassan (2005) evaluates the relative cost, profit, x-efficiency, and productivity of 43 Islamic banks in 21 countries. The study covers the period of 1993-2001. He uses both the Stochastic Frontier Approach (SFA) and the (DEA) technique as tools to examine the efficiency. He calculates five efficiency measures: cost, allocative, technical, pure technical, and scale efficiency. He also correlates the efficiency scores with the conventional accounting measures of performance. The results indicate that the Islamic banking industry is relatively less efficient compared to its conventional counterparts. The overall inefficiency is, by and large, output related, with the main source of inefficiency being allocative rather than technical in nature. Findings also suggest that the Islamic banks are more profit-efficient. The results eventually show that the efficiency measures can be used concurrently with conventional accounting ratios in determining the performance of Islamic banks.

Sufian (2006) examines the efficiency of the Malaysian Islamic banks during 2001-2004 by using the DEA method. Findings suggest that the banks scale inefficiency outweighs pure technical inefficiency. This implies that Malaysian Islamic banks have been operating at a non-optimal level (scale) of operations. Results also show that the domestic Islamic banks have exhibited a higher technical efficiency compared to their foreign Islamic banks peers.

In 2007, Sufian extended his empirical work by directly examining the antecedents of the Malaysian Islamic banking sector's productivity changes over 2001-2005. The study employs the (MPI) to measure efficiency and technological changes. Findings suggest that the Malaysian Islamic banking sector has exhibited decline in productivity, largely due to the decline in technological advancement. Foreign Islamic banks have exhibited lower productivity levels compared to their domestic peers, and the domestic Islamic banks have exhibited higher productivity levels compared to their foreign peers, attributed to higher technological progress and efficiency levels.

There is a small body of empirical literature that offers comparisons of the financial and efficiency performance of Islamic and conventional banking, e.g. Rosly and Bakar (2003), Samad (2004), Yudistira (2004) and Limam (2001). More recently, Johnes, Izzeldin and Pappas (2007) examined the efficiency for Islamic and conventional banks in the GCC-region during 2004-2007. They used financial ratio analysis (FRA) and the (DEA) method. Based on the FRA, Islamic banks were found to be less cost efficient but more efficient than conventional banks in revenue and profit. Results from the DEA reveal that the average efficiency in Islamic banks is lower than conventional peers.

Despite the above discussed literature, empirical researches on the efficiency and productivity of Islamic banks are still in their infancy in Muslim countries and rare in Europe. This is due to the lack of sufficient data and the short presence of Islamic banks. Thus, the main purpose of this chapter is to bridge this gap in the cross-country literature.

5.4. Methodology

The next sub-sections present the application of the DEA approach for efficiency analysis, the DEA-based Malmquist productivity index (MPI) method, and the second-stage of DEA analysis.

5.4.1. Data description and variables

We utilize the DEA-technique to calculate the efficiency scores of the sample banks. We then adopt the MPI technique to measure the contributions of technology in promoting efficiency (technical change). Such a technique is considered to be evidence of innovation and

improvement in efficiency. We estimate DEA efficiency scores and Malmquist indexes using DEA*P* version 2.1, a program developed by Coelli (1996). There are a number of desirable features of the DEA model for our particular study. DEA looks directly for a best-practice frontier within the data (Omar et al. 2006). The advantage of DEA is that it neither requires input nor output prices in the construction of the efficient frontier. This makes the method particularly useful in the case where prices are not available publicly or do not exist. Furthermore, DEA also does not require a behavioral assumption in situations where the producer's objectives differ or are unknown or unachieved. Moreover, DEA takes into account all inputs and outputs simultaneously as well as differences in technology and capacity. It then compares a decision making unit (DMU), each of the banks in our study, with the best-practice frontier peers.

There are two main approaches that have been widely used in banking literature to define inputs and outputs: the production approach and the intermediation approach. Under the production approach, banks use various labor and capital resources to provide different products and services to customers such as loans and deposits. Under the intermediation approach, banks are viewed as financial intermediaries that collect deposits and other loanable funds and then lend them as loans or other assets for profit.

In this chapter, we adopt the intermediation approach because the main characteristic of Islamic banks is that they follow the principle of interest-free and profit-and-loss-sharing (PLS) in performing their business as intermediaries (Ariff, 1988). Islamic banks employ the concept of participation in projects utilizing the funds at risk on a PLS basis. This certainly implies the importance of intermediary activities that Islamic banks perform (Yudistira, 2004). We model Islamic banks as multi-product firms, employing three-inputs and producing two-outputs. The input vectors include: (1) total deposits and short term funding, (2) total expenses, and (3) total staff costs. On the other hand, the output vectors comprise: (1) total (non) interest-bearing loans and (2) total revenues. Table 5.4 in the appendix reports descriptive statistics of outputs and inputs of the commercial banks during the sample period.

Using DEA, we can estimate efficiency under the assumption of constant returns-to-scale (CRS) in the CCR-model, which was proposed by Charnes, Cooper and Rhodes in (1978), and variable returns-to-scale (VRS) in the BCC-model which was initially developed by Banker, Charnes, and Cooper (1984).[3] The CRS assumption is only appropriate when all DMUs are operating at optimal scale. Factors like imperfect competition and constraints in Islamic finance

may cause our sample banks not to operate well at their optimal scale of operations. On the basis of the prior arguments and to account for the fact that the sizes of the banks in our sample vary greatly, ranging from large active banks to small banks, we estimate our model under the assumption of the BCC-model as suggested by Cooper, Seiford, and Tone, (2007). Results obtained from this model are commonly called 'pure technical efficiency (PTE) scores'. This is because they are obtained from the model that allows variable returns to scale (VRS). Consequently, we'll be focusing in this chapter on the PTE scores to examine the comparative performance of the selected banks.

Basically, when measuring efficiency using the DEA approach, there are two typical assumptions with regard to a bank's behavior: an input-oriented model, which is used to identify technical inefficiency as a proportional reduction in input usage, and an output-oriented model, where the technical inefficiency is measured as a proportional increase in output production. In this chapter, we assume an output-oriented approach. Our preference for this measure is due to its reliability and as a better fit to our situation. Islamic banks operating under a competitive environment strive to offer the best possible products for their clients. Therefore, they are more likely to sustain their competitive advantage by increasing their outputs production rather than reducing the input usage.

DEA efficiency estimates, however, can be biased. Alirezaee, Howland, and van de Panne, (1998) argue that the smaller the number of DMUs is, the higher the probability the units will be overestimated. However, this is not an issue in our research design because our sample size is large enough. We follow Cooper, Seiford, and Tone, (2007) and Darrat Topuz, and Yousef, (2002) who suggest the product of inputs times outputs should optimally be less than the sample size $(I*O<n)$.

Additionally, one of the assumptions to apply DEA is that the DMUs must be homogenous units; they should be performing the same tasks and should have similar objectives. This fits well with our sample because the operation of Islamic banking is the same as that of conventional banking except that Islamic banking operates in accordance with the rules of Shari'ah. However,

[3] The value of SE is less than or equal to one. If DMU has a value equal to one, then it is operating at a constant returns-to-scale size (CRS). If SE is less than one, then DMU is scale inefficient (operating at a variable returns-to-scale (VRS)). The scale inefficient DMU will either experience increasing returns-to-scale (IRS) due to being at less than optimum size, or decreasing returns-to-scale (DRS) due to being at more than the optimum size.

both Islamic and conventional banks operate with the same essential goals of earning a profit and benefitting society, even if there are some differences in how they reach these goals.

In our analysis, we use cross-country bank-level panel data compiled from non-consolidated income statements and balance sheets of 23 Islamic banks in 10 countries. We also derive data from 12 small conventional commercial banks in BiH and the UK, six from each country (Table 5.1). Our study differs from others in a few key aspects. We first compare the efficiency performance of IBB, *the first British stand-alone full-fledged commercial Islamic bank in the west*, and BBI, *the first Islamic commercial bank in Bosnia and Herzegovina*, against 12 small and 9 large Islamic commercial banks from Muslim-majority countries. We then employ the inter-bank comparison approach to compare the efficiency performance and productivity change of IBB against 6 small conventional banks in the UK, and BBI [4] against 6 small conventional ba-

Table 5.1
Summary statistics of the population and the selected sample

Region- country	**No. of Islamic commercial banks -per country**	**selected sample banks** [5]
Middle East,(GCC)		
Qatar	4	2
Saudi Arabia	5	3
Kuwait	4	2
Bahrain	6	5
U.A.E	9	3
M1*: Banks with AvTA of ≤1.5 bn £. (7)**		
M2: Banks with AvTA of >1.5 bn £. (8)		
Southeast Asia		
Malaysia	16	3
M1: Banks with AvTA of ≤1.5 bn £. (2)		
M2: Banks with AvTa of >1.5 bn £. (1)		
Eurasia		
M1:Turkey (2)	5	2
M1: Azerbaijan (1)	1	1
All banks have AvTA of ≤1.5 bn £.		
Europe		
M1+ M2: UK (1)	1	1
M1+ M2: BiH (1)	1	1
SUM	23 (out of 52)	52

* Model-M1 measures the efficiency performance of IBB & BBI relative to small Islamic banks in Muslim countries. Model-M2 measures the efficiency performance of IBB & BBI relative to large Islamic banks in Muslim countries. Model-M3 measures the efficiency performance of BBI relative small conventional banks in BiH. Model-M4 measures the efficiency performance of IBB relative small conventional banks in the UK. However, utilizing data from Model-M1 in the DEA, we measure the relative Malmquist indices of productivity change of IBB and BBI compared with small Islamic banks from Muslim countries. We further make use of Model-M3 and M4 to measure the relative productivity growth of BBI and IBB relative to small conventional banks in both BiH and the UK respectively. ** The column represents the number of the banks in each model.

Country	**Small conventional banks in BiH & the UK**
BiH	6
M3: Relative efficiency of BBI compared with small conventional banks in BiH.	
UK	
M4: Relative efficiency of IBB compared with small conventional banks in the UK.	6
SUM	12

[4] BBI claims to be the first Islamic bank in Europe, as it was established on 19 Sep. 2000, 4-years before the IBB was granted a license. However, oldest bank is not necessarily the oldest in history, but the well-developed, the fastest-growing, and the leader in pioneering new and a wide range of financial products and services. Thus, it is generally accepted that the IBB is considered as the first stand-alone full-fledged Islamic commercial bank in the western world. Also, the UK is considered to be the hub of Islamic banking and has the most active and developed Islamic banking sector in Europe which helps the IBB to become more mature compared with BBI. In Bosnia-Herzegovina there is no stock market, and thus BBI cannot emulate the IBB in seeking additional equity finance through having a listing on a local Alternative Investment Market.

[5] The number of banks is reduced mainly due to the exclusion of**: *i*)** the new banks that are not older than 5 years , ***ii*)** all banks other than the commercial Islamic banks, and ***iii***) Islamic banks whose financial statements were consolidated with their parent banks.

nks from BiH respectively. We eventually estimate the cross-country productivity changes of small Islamic commercial banks, both within and outside Europe.

For the purpose of analysis and to analyze the size-efficiency relationship, Islamic banks across the sample are grouped by total assets. Banks with more than 1.5 £ (KM) bn of average total assets ($AvTA_{2005-2008}$) are categorized as large size, and banks below this level are categorized as small-to-medium size. The time interval 2005-2008 is used to measure the effects of the current global financial crisis on banks efficiency.

5.4.2. The empirical specifications

5.4.2.1. The DEA-Model

DEA is defined as a linear programming technique that compares multiple outputs and inputs used by firms (DMUs) and generate relative efficiency scores. DMUs with an efficiency score of unity are considered relatively efficient and make up the frontier, while those with a score below unity are relatively inefficient (Berger and Humphrey, 1997). To measure the efficiency of a given DMU, Charnes, et al. (1978) propose the use of the maximum of the ratio of weighted outputs *(y)* to weighted inputs (*x)*, subject to the condition that similar ratios for all other DMUs be ≤ 1. For each DMU, efficiency is calculated as follows (Ataullah, Cockerill, and Le, 2004):

$$max\ e_0 = \sum_{j=1}^{J} w_j^0 y_j^0 / \sum_{i=1}^{I} v_i^0 x_i^0 \qquad (1)$$

Subject to:

$$\sum_{j=1}^{J} u_j^0 y_j^n / \sum_{i=1}^{I} v_i^0 x_i^n \leq 1; \quad n = 1, \ldots, N \; v_i^0 u_j^0 \geq 0; \quad i = 1, 2 \ldots I; \quad j = 1, 2 \ldots J \qquad (2)$$

Where, y_j^n and x_i^n are positive known outputs and inputs of the n_{th} DMU, respectively. The variables v_i^0 and u_j^0 are the variable weights to be determined by solving linear problem 1. The DMU being measured is indicated by the index 'o'. The optimization is defined for every DMU in the sample such that if the efficiency score $e^o = 1$, the DMU^o is 100% efficient within the sample. Charnes, Cooper, and Rhodes (1978) transform the above formula into the following linear programming problem (Ataullah, Cockerill, and Le, 2004):

$$max\ h^0 = \sum_{j=1}^{J} u_j^0 y_j^0 \qquad (3)$$

Subject to:

$$\sum_{i=1}^{I} v_i^0 x_i^0 = 1 \quad \sum_{j=1}^{J} u_j^0 y_j^n - \sum_{i=1}^{I} v_i^0 x_i^n \leq 0 ; \qquad n=1,\ldots, N; v_i^0 \geq \varepsilon, \quad u_j^0 \geq \varepsilon ; \quad i=1, 2,\ldots,I \quad j=1, 2,\ldots,J \tag{4}$$

Where '**ε**' is an arbitrary small positive number introduced to ensure that all of the known inputs and outputs will have positive weights. When $h^o = 1$, then the DMU^o is efficient; otherwise it is inefficient. However, if inputs are being used ineffectively, then we will have input slack (input-excess), and conversely we will have output slack (output-shortfall). Slack represents the improvements needed to make an inefficient unit become efficient and thus, all input slack and output slack must be equal to zero. These improvements are in the form of an increase/decrease in inputs or outputs. In our analysis, we utilize the multi-stage (MS)-DEA methodology (Coelli, 1996), where the outputs from one process can be used as the inputs for the next process, allowing a sequence of radial linear programs in order to identify the efficient projected point for the treatment of slacks. This method is computationally rigorous and more demanding than the one and two-stage methods (Coelli, 1998).

5.4.2.2. The DEA -Malmquist Productivity Index -MPI

There are several different methods that could be used to measure the distance function which make up the Malmquist index.[6] Färe, Grosskopf, Lindgren, and Roos, (1992) construct the DEA-based Malmquist productivity index as the geometric mean of two Malmquist productivity indexes of Caves, Christensen and Diewert, 1982. An important feature of the DEA-Malmquist productivity index is that it can be decomposed into two components: one measuring change in relative technical efficiency (TEch) (how the units being examined have managed to catch-up to the frontier) and the other one measuring change in technology innovation (TECch).

The Malmquist productivity index can be used to identify productivity differences between two firms or one firm over two-time periods (Caves, Cristensen, and Diewert, 1982). Malmquist index numbers can be defined using either the output or the input-oriented approach. This study adopts the output-oriented Malmquist index to measure the contributions from the progress in technology and efficiency change to the growth of productivity in Islamic commercial banks. The output-oriented productivity measures focus on the maximum level of outputs that could be

[6] The Malmquist productivity index (MPI) is often seen as the real driver of growth within an economy. It is used to measure firms' productivity growth. MPI does not require the profit maximization or cost minimization assumption, and information on the input and output prices.

produced using a given input vector and a given production technology relative to the observed level of outputs. This can be achieved using the output distance functions. Caves et al. (1982) show how distance function can be used to define Malmquist indices of productivity change. Färe, Grosskopf, Lindgren, and Roos (1989) show that the output-based Malmquist productivity index between time periods (t) and (t + 1) can be defined as follows (Omar et al. 2006):

$$M_0(x^t, y^t, x^{t+1}, y^{t+1}) = \left[\frac{D_0^t\,(x^{t+1}, y^{t+1})}{D_0^t\,(x^t, y^t)} * \frac{D_0^{t+1}\,(x^{t+1}, y^{t+1})}{D_0^{t+1}\,(x^t, y^t)}\right]^{1/2} \quad (5)$$

Where the notation '$D_0^t\,(x^{t+1}, y^{t+1})$' represents the distance from the period (t+1) observation to the period (t) technology, while (x) and (y) indicate the input and the output, respectively. It measures productivity change from period (t) to period (t+1) using period (t) technology as a benchmark. The second ratio is the period (t+1) Malmquist index and it measures the productivity change from period (t) to period (t+1) using period (t+1) technology as a benchmark. Having a value of (M) greater than one denotes productivity growth (progress or improvement), a value less than one indicates productivity decline (regress or deterioration),while a value of unity corresponds to stagnation (no change). Färe, Shawna, Mary, and Zhongyang (1994) show that the MPI can be decomposed into two components as follows:

$$M_0(x^t, y^t, x^{t+1}, y^{t+1}) = \frac{D_0^{t+1}\,(x^{t+1},\ y^{t+1})}{D_0^t\,(x^t, y^t)} * \left[\frac{D_0^t\,(x^{t+1}, y^{t+1})}{D_0^{t+1}\,(x^{t+1},\ y^{t+1})} * \frac{D_0^t\,(x^t,\ y^t)}{D_0^{t+1}\,(x^t, y^t)}\right]^{1/2} \quad (6)$$

The first ratio of Eq. 6 measures the relative technical efficiency changes (TEch) (i.e. movement toward the frontier) from years (t) to (t+1). The second term inside the squared brackets (geometric mean of the two ratios) captures the shift in technology or technological changes (TECch) (i.e. shifts in the frontier itself) between the two periods evaluated at (x^t) and (x^{t+1}). Färe et al. (1994) further decompose the technical efficiency change (TEch) component into a pure technical efficiency component and a scale efficiency component as follows:

$$\text{Pure Technical Efficiency Ch. } (PTE_{ch}) = \frac{D_0^t\,(x^t, y^t)}{D_0^{t+1}\,(x^{t+1}, y^{t+1})} \quad (7)$$

$$\text{Scale Efficiency Ch. } (SE_{ch}) = \left[\frac{D_{oc}^{t+1}\,(x^t, y^t)}{D_0^{t+1}(x^t, y^t)} * \frac{D_0^{t+1}(x^{t+1}, Y^{t+1})}{D_{oc}^{t+1}\,(x^{t+1}, y^{t+1})} * \frac{D_{oc}^t\,(x^t, y^t)}{D_0^t\,(x^t, y^t)} * \frac{D_0^t\,(x^{t+1}, y^{t+1})}{D_{oc}^t(x^{t+1}, y^{t+1})}\right]^{1/2} \quad (8)$$

Where PTE_{ch}*SE_{ch} = change in technical efficiency (TEch). PTEch measures the relative ability of the DMUs to convert inputs into outputs. It is defined as the ratio of the own-period distance functions in each period under VRS. SEch, on the other hand, captures changes in the deviation between the VRS and CRS technology. It measures to what extent the DMUs can take advantage of returns to scale by altering its size towards optimal scale (Färe et al. 1994). However, changes in SE may be caused by: **I)** changes in the shape of technology, **II)** changes in the location of the bank in the input/output space between (t_1) and (t_2), or a combination of **(I)** and **(II).** While any change in the PTE is caused by a movement of the bank relative to the existing technology (Hassan, 2005).

5.4.2.3. The DEA- second-stage analysis : OLS-regression approach

In order to account for the macroeconomic effects on banking efficiency, we adjust the sample data for differences among countries by deflating all variables using the Consumer Price Index (CPI). We also perform the two-stage method to test the statistical association of the efficiency estimates, obtained from DEA model-1 to model-4, with variables that are neither considered inputs nor outputs and also to determine their influence on the bias-corrected efficiency scores. Thus, after solving for DEA, the efficiency scores are regressed upon the environmental variables which could influence the efficiency of a bank (Sufian and Zulkhibri, 2008).

Due to the fact that the dependent variable in DEA analysis has an upper limit of 100% (censored variable) and because we have to deal with biases caused by inefficiency, Tobit regression is not valid to be applied in this stage of analysis (Kumbhakar and Lovell, 2000). McDonald (2009) advocates using (OLS) in the DEA 2-stage arguing that it is considered a consistent estimator. In this chapter, we examine the following econometric regression model:

$$\text{E.1: } (\xi s) = \alpha + \beta_1 \text{BP.}_{jt} + \beta_2 \text{ PER.}_{jt} + \beta_3 \text{ LIQ.}_{jt} + \beta_4 \text{ LOG. (AS)}_{jt} + \beta_5 \text{ LTA.}_{jt} + \beta_6 \text{ DEPO.}_{jt} + \beta_7 \text{ IND.}_{jt} + \beta_8 \text{ AGE}_{jt} + \beta_9 \text{ LEV.}_{jt} + \beta_{10} \text{ GDP}_{jt} + \beta_{11} \text{GEO.}_{jt} + \varepsilon \quad (9)$$

Where the subscript (*j)* refers to a bank, and the subscript (*t)* refers to a sample year. The dependent variable (ξs) is the bank's pure technical efficiency (DEA_{PTE}) which is regressed on a set of common explanatory variables (Table 5.7- appendix). In this chapter, the efficiency of Islamic banks based on binary comparisons is analyzed. Consequently, two regression models

(E1 and E2) were basically measured. The first model (E1: model-M1 and model-M2) measures the relative efficiency of IBB and BBI against small and large Islamic banks from Muslim countries, respectively. The second model (E2: model-M3 and model-M4) investigates the relative efficiency performance of the IBB and BBI against small conventional banks in the UK and Bosnia respectively. Empirically, in E2, we replaced the predictor variable (β_{11} $GEO._{jt}$) by the predictor variable ($\beta_{11}DIVER_{jt}$). This is basically in order to test if Islamic banks generally enjoy a lower diversification benefit than their conventional counterparts.

5.5. Empirical results

In this section, we first introduce the results pertaining to the efficiency scores (mainly DEA_{PTE} scores because we originally estimate our model under the assumption of DEA-VRS) of IBB and BBI relative to the small and large Islamic banks in Muslim countries and also relative to the small conventional banks in the UK and BiH, respectively (Table 5.2.1-5.2.4). This is followed directly by the presentation of the results obtained from the comparative analysis of the productivity growth of IBB and BBI relative to small Islamic banks from Muslim-majority countries (Table 5.3.1-5.3.4). We then discus the progress in productivity of BBI and IBB relative to a carefully selected sample of conventional banks in BiH (Table 5.5.1-5.5.4) and in the UK (Table 5.6.1- 5.6.4). Finally, we present the results of the DEA-second stage analysis of efficiency performance.

5.5.1. Cross-country analysis of banks efficiency performance: DEA-based analysis

Table 5.2.1 illustrates the DEA-efficiency scores: overall efficiency (Crste), pure technical efficiency (DEA_{PTE}) and scale efficiency (DEA_{SE})) of IBB and BBI relative to small Islamic banks from Muslim-majority countries (model-M1). Results show that both banks have pure technical efficiency scores of less than 1 ($DEA_{PTE}<1$) in each sample year, and thus, are identified as relatively technically inefficient compared to other Islamic banks in model-M1. Results also suggest that, despite being technically inefficient, both, IBB and BBI, exhibit an upward trend in DEA_{PTE} scores. Therefore, they have substantial room for improvements to sustain a competitive edge in Europe. Overall, it is clear that BBI seems to perform slightly better (closer to the best-practice frontier) than IBB in terms of the average (DEA_{PTE}) (Fig. 5.1-appendix).

Scale efficiency scores for individual banks-(DEA_{SE}) in model-M1 (Table 5.2.1) show that the IBB experiences a decreasing returns-to-scale (DEA_{DRS}) (so-called diseconomies of scale). This implies that the bank is too large (and has supra-optimum scale size) to take full advantage of scale, and so it should simply shrink certain outputs (i.e. total non-interest bearing loans and total revenues), because we primarily assume an output-oriented model. In contrast, BBI has an increasing return-to-scale (DEA_{IRS}) implying that the bank is too small for its scale of operations and thus operates at sub-optimum scale size. BBI is scale inefficient due to its potential to achieve much higher levels of outputs in BiH. BBI could, however, improve its efficiency by scaling up operations and activities. Results also show that the DEA_{SE} of BBI and IBB is higher than the banks' DEA_{PTE} in all years (e.g. $DEA_{SE\ (BBI\text{-}2005)} = 99.1\% > DEA_{PTE\ (BBI\text{-}2005)} = 24.3\%$, $DEA_{SE\ (BBI\text{-}2006)} = 99.4\% > DEA_{PTE\ (BBI\text{-}2006)} = 34.5\%$, etc.)[7]. This demonstrates that the overall technical inefficiency appears to be largely due to pure technical inefficiency rather than scale inefficiency. Based on these results, and due to the fact that the DEA_{PTE} captures the management practices while the DEA_{SE} reveals whether or not the bank operates under optimal size, it seems that the banks inefficiencies are mostly due to poor management.

In comparison with large Islamic banks in model-M2 (Table 5.2.2), BBI shows efficient performance in the first two years ($DEA_{PTE\ (2005\text{-}2006)} = 1$) despite its small size. The bank's efficiency scores gradually decreased over time until it became inefficient throughout 2007-2008 ($DEA_{PTE\ (2007\text{-}2008)} < 1$). Surprisingly, BBI is slightly better able to operate closer to its efficient frontier than IBB (Fig. 5.2- appendix). However, unlike BBI, IBB shows an overall upward trend of DEA_{PTE} scores over the sample period (e.g. $DEA_{PTE\ (2006)} = 65.8\%$, $DEA_{PTE\ (2007)} = 70\%$, and $DEA_{PTE\ (2008)} = 86.9\%$). By and large, both banks report a low DEA_{SE} compared to DEA_{PTE} and consistently achieve a DEA_{IRS} over the sample period. Such results imply that they suffer most from the non-optimal level (size) of operations.

We measure the comparative efficiency scores of BBI versus small conventional banks in BiH banking industry in model-M3 (Table 5.2.3 and Fig. 5.3- appendix). Results confirm the previous findings and show that the bank is, by and large, inefficient and its mean performance is

[7] Secondarily, in order to further extend the explanation of results concerning the efficiency performance of Islamic banks in Europe, results from Table 5.2.1 also illustrates that the Islamic banks from Turkey (geographically speaking, Turkey belongs to Europe) achieve efficiency scores of less than 1 over the first 3-years. In contrast, in 2008, they become increasingly more efficient. The DEA_{PTE} for these banks is, on average, higher than DEA_{SE} consequently, bank's inefficiency was attributed largely to scale inefficiency and to a lesser extent to the pure technical inefficiency. However, our analysis shows that the Turkish Islamic banks are more efficient than BBI and IBB. For example in 2005, the DEA_{PTE} for IBB and BBI is 30.7% and 24.3% compared to 76.1% and 89.3% for Albaraka Turk bank and Kuveyt Turk bank, respectively. Turkish Islamic banks record a DEA_{DRS} over the sample years. This indicates that they could improve their own efficiency by scaling down activities because they are too large for the volume of operations they conduct.

at the lower end of the spectrum of small banks. BBI operates at increasing returns to scale (DEA_{IRS}), suggesting that the bank is relatively small compared to its counterparties-conventional banks. Meanwhile, the bank's DEA_{PTE} is higher than DEA_{SE} and thus, its overall inefficiency appears to be mostly due to scale (size of banks operation) rather than pure technical inefficiency (management practices).

Similarly, we measure the comparative efficiency scores of IBB against small conventional banks in the UK in model-M4 (Table 5.2.4 and Fig. 5.4-appendix). Results reveal that IBB fails again to appear on the efficiency frontier over the years 2006-08, and hence is identified as inefficient. In contrast to BBI, IBB operates at a DEA_{DRS} (diseconomies of scale-too high scale of operation) throughout the sample period. Meanwhile, pure technical (in)efficiency dominates scale (in)efficiency ($SE_{05\text{-}08}$>$PTE_{05\text{-}08}$). Based on that, IBB is said to be technically inefficient largely due to 'bad' management and to some extent because of the non-optimal size of operations.

Overall, results from model-M1, M2, M3, and M4 show that the DEA_{PTE} of large Islamic banks from Muslim-majority countries is, on average, on a declining trend from 2005 to 2008. On contrary, IBB experiences a trend of increasing efficiency relative to other Islamic banks (small and large) over the period 2006-2008 but records a negative trend of efficiency performance levels as compared to conventional banks in the UK. Meanwhile, BBI suffers a decline in estimated efficiency during 2007 and 2008, strikingly though, at a low rate compared with most of its conventional-counterparts in BiH, and Islamic banks (particularly the large banks) in Muslim countries. This, however, reflects a smaller impact of the global financial crisis of 2007-2008 on small Islamic banks, either from Muslim countries or from Europe. This also suggests that they can provide certain services better and more efficiently than their counterparties-conventional banks and the large Islamic banks from GCC-States, Malaysia, and Turkey.[8]

5.5.2. Cross-country analysis of banks productivity growth: DEA-based MPI analysis

In this section, we focus on productivity changes with respect to the 14 small Islamic banks operating within and outside Europe (model-M1). Tables 5.3.1 to 5.3.3 report the estimated

[8] Our analysis shows that Kauther bank is a special case. It is efficient because it receives unit efficiency scores over the sample years in model-M1. But because the bank has the smallest inputs and outputs, it has no peers to which it can be compared, and thus, it is considered as efficient 'by default'. All other banks in our sample have comparable units except Kauther bank. The bank is self-identified as 100% efficient not because it dominates other banks but because there are no other banks with which it is comparable. This, however, indicates that Kauther bank is not truly (should not be regarded) efficient relative to other banks in the sample.

values of the Malmquist-based total factor productivity (TFP) index, along with its two subcomponents: changes in technical efficiency (TEch) and changes in technological efficiency (TECch). Subtracting 1 from the reported results yields an average percentage increase or decrease per annum.

Table 5.3.1 shows that the Islamic banking sector, within and outside Europe, exhibits a decreasing trend in the relative TFP growth over the sample period, with a mean TFP of 106.3% in 2005-06, 96.5% in 2006-07, and 95.1% in 2007-08. In contrast, both IBB and BBI yield positive growth until 2006-07, but the trend reverses in 2007-08. Overall, results illustrate an inefficient performance of the entire Islamic banking sector, with a mean TFPch of 99.3% (indicating 0.7% decline in TFP). By specifically analyzing the efficiency performance of 'old' versus 'new' banks,[9] findings suggest that some old (large) banks from Muslim countries, such as Albaraka Turk, Kuveyet Turk, and QIIB, have been able to achieve a positive productivity growth TFPch of 4%, 1.4%, and 7.7%, respectively. Strikingly, some of the newer banks, particularly from Europe, achieved a much higher TFP growth. For example, BBI exhibits an average increase (growth) of 24.8% in $TFP_{2005\text{-}08}$ mainly due to high average growth rate (progress) of 2.9% (Table 5.3.2) in technological efficiency (TECch). This suggests that the desirable increase in TFP of the BBI should be primarily based on technology innovation rather than the improvement in technical efficiency. However, IBB, in contrast, produces an average decline (negative growth) of $TFP_{2005\text{-}08}$ = -3.6% (calculated as 1 – 96.4%) driven mostly by the significant regress of 29.8% (calculated as 1 – 70.2%) in the bank's TECch (Table 5.3.2).

Table 5.3.2 presents the index values of technological progress/regress as measured by average shifts in the best-practice frontier from period (t) to (t+1). Results show an overall downward trend in the Islamic banking sector's technological (innovation) efficiency (TECch) throughout the sample years (i.e. 15% in 2005-06,-6.8% in 2006-07, and -10.5% in 2007-08). The sector suffers, however, an average regress of -0.8% (calculated as 1-99.2%) in TEC over sample years. Large portion of the productivity regression in 2007-08 was caused by Islamic banks from Muslim countries. Islamic banks from the UK, BiH and Turkey accounted for a relatively small amount of the aggregate technological inefficiency. For example, while many banks show a negative TECch growth in 2007-08, BBI and IBB show an upward trend in TECch, proving their

[9] The bank's age is calculated from the date of incorporation until the 1st of 2010. For the purpose of our study, banks that are not older than 10 years (Age ≤10 years) are considered new. Otherwise, they are considered as old banks.

ability to get closer to the productivity frontier with high TECch scores of 95.4% and 92.8% respectively.

Table 5.3.3 displays changes in the relative technical efficiency (TEch) for each individual bank. Results show a considerable variation across banks and years. On average, BBI is relatively technically efficient with mean score of 1. Kauther bank records the highest efficiency change of 16.7%, followed directly by IBB with average efficiency scores of 15.3%. Such results illustrate that the Islamic banks from Europe perform relatively better than some of those operating in Muslim-majority countries despite the legal obstacles and economic restrictions, such as the conventional banking regulations and the lack of uniform standards of credit analysis, which may put these banks in a challenging situation. This could be due to the fact that the Islamic banks from Muslim countries, either small or large, are relatively larger (in terms of total asset) than Islamic banks that are operating in Europe. Therefore, they tend to engage in more complex Islamic-compatible products and services, which could negatively affect the banks' relative efficiency levels. Overall, findings show that the Islamic banking sector has been in a downward trend in technical efficiency from 2005-07 but, surprisingly, shows a quick recovery in 2007-08 despite the global financial and economic crisis which commenced in 2007.

Table 5.3.4 presents the decomposition of the technical efficiency change into two subcomponents namely: pure technical efficiency change (PTEch) and scale efficiency change (SEch). The table clearly shows that the PTEch is higher than the SEch in 2005-06 and 2006-07. This implies that the technical inefficiency change for the Islamic banking sector is primarily driven by scale inefficiency (non-optimal size of operations). In contrast, SEch is higher than PTEch in 2007-08, which suggests that the technical inefficiency in Islamic banks, as they become mature, is more than likely due to the managerial factors, such as shortage of Islamic finance expertise versed in Shari'ah law. Overall, it seems that the growth in TFP for Islamic banking sector is largely contributed by PTEch rather than SEch (average SEch=99.1% < average PTEch=106.3%). This indicates that the size of the bank does matter in affecting productivity changes and implies that the banks future growth in TFP could be based on the size of the bank's operations.

5.5.3. Inter-bank analysis of banks productivity growth: DEA-based MPI analysis

5.5.3.1. The banking industry in Bosnia and Herzegovina

The results in Table 5.5.1 show that the BBI records the highest value in total factor productivity growth (TFPch) for 2005-06 relative to all counterparties-conventional banks. But it gradually loses its superiority over other banks and is unable to maintain its number one position in subsequent years. Overall, the bank still retains the highest mean TFPch over sample years.

Concerning the analysis of banks TECch (Table 5.5.2), findings suggest that all conventional banks in BiH experience both technology progress and regress. Surprisingly, BBI consistently exhibits a technology progress during the sample period. More specifically, BBI records a positive growth of 5.2% in 2005-06, 22.3% in 2006-07 and 7.4% in 2007-08. BBI records also an average growth rate of 11.6% (1.116 -1) compared with an average TECch of 8.1% (calculated as: (1+1.1+1.307+1.022+1.128+0.927)/6) attained by (all) counterparties-conventional banks. These results, however, suggest that the high factor productivity growth achieved by average banks in Bosnia's banking sector, including the BBI, as observed in (Table 5.5.1) is largely attributed to the technological efficiency rather than technical efficiency.

Table 5.5.3 reports the changes in banks' relative technical efficiency (TEch) while Table 5.5.4 reports the changes in the components of technical efficiency (PTEch and SEch). Results in Table 5.5.3 show that the overall Bosnia's banking industry, as well as BBI, suffers a clear declining trend in estimated TEch from 2005 to 2008 (i.e. $TEch_{sector\ 05\text{-}06}$=109% > $TEch_{sector\ 06\text{-}07}$= 101.6% > $TEch_{sector\ 07\text{-}08}$= 98.5% meanwhile, $TEch_{BBI\ 05\text{-}06}$=120.6% > $TEch_{BBI\ 06\text{-}07}$= 102.3% > $TEch_{BBI\ 07\text{-}08}$= 94.3%). As far as the full sample period is concerned, BBI records, on average, the third-highest mean TEch of 5.7% as compared to counterparties-conventional banks. This suggests that BBI has made relatively better technical progress than some of conventional banks having the same economic circumstances and similar size.

Results in Table 5.5.4 show that the mean PTE_{ch} of banks in BiH is less than the mean SEch throughout 2005-2007. In 2007-2008 the mean PTEch becomes higher than the mean SEch. Similarly, at the individual bank level, the PTEch for BBI trends up over the years 2005-2008 and eventually outperforms SEch in 2007-08 ($SEch_{07\text{-}08}$ =94.3 < $PTEch_{07\text{-}08}$ =1). These results indicate that the PTEch (improvements in management practices) appears to be a less important source of future growth of technical efficiency as compared to the optimal size component.

Overall, findings show that the highest growth in mean TFP, TECch, and TEch was achieved by banks other than the BBI. This growth was driven by banks' optimal scale of operations. The relative superiority of (some) conventional banks over BBI may re-emphasize the important role of the conventional economic restrictions and the lack of legal support and effective prudential regulations on affecting the efficiency performance of Islamic banks in BiH.

5.5.3.2. The banking industry in the UK

Table 5.6.1 shows that the IBB records an upward trend in TFP over the sample years (i.e. 78.4% in 2005-06, 90.6% in 2006-07, and 93.4% in 2007-08). Despite this positive trend, the bank suffers the highest average TFP deterioration of -12.5% (calculated as 1 - 87.5%) over 2005-2008 relative to counterparties banks. In contrast, the average counterparties-conventional banks produce positive growth of 4.2% (calculated as: 1- (1.009+1.058+1.009+0.998+1.162+1.014) /6) for the same time interval.

In terms of the relative technological change (TECch), results in Table 5.6.2 show an increasing growth rate in technological innovations for average conventional banks over the period 2005-2007 (i.e. from 118.2% in 2005-2006 to 128.1% in 2006-2007, calculations do not include IBB) but reveal also a sudden decrease in TEC growth rates during the adverse economic conditions in 2007-08 with a TECch =126.3%. In contrast, IBB individually exhibits a strong and consistent upward trend in the average TECch over the sample years (i.e. $TECch_{05-06}$ =78.4% and $TECch_{06-07}$ =90.6%) and also, surprisingly, it becomes technologically efficient with a TECch= 100.8% in 2007-2008. Such results confirm that the Islamic banking in the UK has a strong long-term potential for further growth in technology innovation in spite of the economic downturns.

Table 5.6.3 presents the findings related to banks relative technical efficiency (TEch). Overall, results illustrate that the entire UK banking sector (Islamic and conventional) experiences a gradual decrease in technical efficiency (i.e. from 102.2% in 2005-06 to 101.03% and 97.4% in 2006-07 and 2007-08 respectively). More specifically, IBB suffers a sharp decline of 7.3% (calculated as: 1- 92.7%) in the technical efficiency performance in 2007-08 after two years of good and consistent performance. By and large, results clearly illustrate that the IBB is still nascent and lagging behind its counterparties-conventional banks in the UK financial system with an overall mean TEch of -2.4% (calculated as: 1- 97.6%).

Table 5.6.4 summarizes the changes in the two components of bank's technical efficiency in the UK. The UK conventional banks, on average, have a low SEch relative to its PTEch (i.e. $PTEch_{05\text{-}08}$ =100.9% > $SEch_{05\text{-}08}$ =99.9%, IBB is excluded from calculation), indicating that the sector's technical inefficiency is largely scale in nature rather than managerial. In contrast, IBB records the highest deterioration of – 6.9% (1- 93.1%) in PTE in 2007 and 2008. It also records a low deterioration rate of -0.5% (1- 99.5%) in SE for the same period. This suggests that the size of IBB operations appears to be less important source to further technical efficiency growth as compared to the PTEch, which is primary driver of the IBB inefficient performance.

Overall, results suggest that the average growth of 1.8% in TFPch (Table 5.6.1), 1.6% in TECch (Table 5.6.2), and 0.30% in TEch (Table 5.6.3) in the UK banking sector (conventional and Islamic) is more likely due to management efforts rather than the scale component. More specifically, on average, IBB records the lowest average growth of –12.5% in TFPch, which is driven mainly by the bank's average technological (TECch) regress of –10.1%. However, the TEch contribution to the bank's low growth in TFPch is relatively minor.

5.5.4. Adjustment to the environmental differences: OLS-regression results

The second-stage DEA analysis reveals a different set of findings. In contrast to the DEA-efficiency results, which suggest that the bank size has no significant predictable effect on its efficiency, the second- stage DEA analysis shows that the bank size has a significant positive relationship with DEA_{PTE} efficiency scores, in model-M2, (t = 2.743, p = 0.05).[10, 11] This indicates that the larger Islamic banks have inevitably higher DEA_{PTE}. The large size promotes technical efficiency by inducing economies of scale to reduce average total costs. Large size is also anticipated to enable banks to be more diversified in an uncertain macroeconomic environment, to mobilize more funds and hence generate high returns to its depositors, and to finance a large number of profitable investment opportunities.

In testing the relationship between leverage and efficiency performance, we find a significant positive relationship in model-M3 (small conventional banks) with (t= 1.856, p<0.10). This illus-

[10] As stated previously in chapter 4, in practice, the application of both regression and DEA on the same data set often produces strikingly different efficiency results, particularly in the small samples which are prevalent in regulated industries (Cubbins, and Tzanikadis, 1998).

[11] If $\alpha = 0.05$ and If $p \leq 0.05$, we reject the null hypothesis and accept the alternative hypothesis.

trates that small conventional banks with high levels of leverage are more efficient. A high leverage or a low capital adequacy reduces the agency cost and increases a bank's efficiency. Thus, the high performing banks acquire more debt (Ross, 1977). The leverage also allows small banks to make a lot of safer loans and therefore plenty of investment returns.

Another important finding is the regression coefficient between the obtained DEA scores and the financial ratios (ROA and ROE). Interestingly, the analysis reveals a statistically significant [12] relationship between the variables in model-M1 ($t = 2.243$, $p < 0.05$), in model-M2 ($t = 2.437$, $p < 0.05$), and in model-M3 ($t = 2.089$, $p < 0.10$). Findings illustrate that the more profitable Islamic (small and large) and conventional banks are more efficient. Such results suggest that the various measures of efficiency are strongly associated with the traditional accounting measures of performance, which are always considered as useful tool for comparing one bank against another, and hence are robust and not 'valueless' artifacts of our advanced techniques.

To assess the effects of the skills utilization on the bank's efficiency, we use the human management as proxy. Results show a statistically significant relationship between efficiency scores and staff utilization variables in model-M2 ($t = 7.939$, $p<0.001$). The results suggest a strong link between increased investment in skills and the positive efficiency trends in the large Islamic banks. In contrast, the same explanatory variable does not have a significant influence on promoting efficiency for conventional banks.

The proxy for economic conditions (GDP) displays a positive and significant relationship with DEA_{PTE} in model-M1 ($t = 2.257$, $p < 0.05$), and in model-M2 ($t = 2.239$, $p < 0.05$). Such a result indicates that the favorable macroeconomic conditions seem to stimulate higher efficiency. This is due to the fact that the excessive demand for Islamic financial services tends to grow as economies expand.

To control for the effects of the geographical region on banks' efficiency, the predictor (GEO.) is used. Results suggest that small Islamic banks from Europe exhibit a much better performance compared with large Islamic banks operating in Muslim countries ($t = 2.138$, $p<0.05$-model-M2) in spite of the restrictions and conventional regulations in the UK banking industry. It is significantly more complex for Islamic banks to adjust their credit risk monitoring system as they become bigger. Large banks tend to engage in more PLS arrangements compared to small b-

[12] Because of the high correlation between ROA and ROE (M1*:* r= 0.795, M2: r=0.933, and M3: r=0.837), the later measure was dropped from the analysis

anks and thus, monitoring schemes becomes more diverse, which could consequently reduce banks efficiency (Čihák and Hesse, 2008).

To capture the effects of liquidity and the absence of an international inter-bank money market for Islamic banks on their overall efficiency, the independent variable (liquidity) is used. Results reveal a significant negative relationship between the liquidity predictor and the DEA_{PTE} in the context of conventional banking system in model-M3 (t=-1.891, p<0.10). This indicates that conventional banks that accumulate a significant amount of liquid resources have inefficient performance. In the context of Islamic banks, the analysis fails to find significant relationship between liquidity and DEA_{PTE} in model-M1 and model-M2.

Results regarding the effects of banks' diversification on the DEA_{PTE} scores reveal insignificant inverse relationship. It appears that there is no significant difference between Islamic and conventional banks in term of product diversity. This finding, nevertheless, does not support the prevailing belief that Islamic banks generally enjoy a lower diversification benefit than their conventional counterparts because they enjoy limited set of investments opportunities due to the Shari'ah restrictions.

Additionally, with regard to the impact of the age of a bank on efficiency, results show insignificant negative coefficients in all models. This suggests that new banks can be as efficient as old banks. However, the negative direction in the relationship between the two variables suggests that older banks are not necessarily flexible enough to make the rapid adjustments to changing circumstances as opposed to new banks which are considered more entrepreneurial.

In order to estimate the effects of the bank's market share on efficiency, we use the bank's deposits as a proxy. Results reveal a statistically insignificant negative relationship between the two variables. The insignificant correlation between the two variables, theoretically, suggests that the more efficient banks may have either a lower or higher market share, implying that banks with small market share can be at least as efficient as the market prominent banks are.

The proxy of bank's loans intensity shows a statistically insignificant positive relationship with DEA_{PTE}. This illustrates that small banks with higher loans-to-assets ratios might have either higher or lower efficiency scores. As a result, small banks' loans seem not to be valued more than alternative banks outputs. Eventually, the estimation of the lack of independency factor that is

used to capture the impact of a bank's dependency on its efficiency reveals an insignificant relationship with DEA_{PTE}. This indicates that there is no evidence that a bank's independence is related to high efficiency.

5.6. Conclusions

Based on DEA-efficiency scores, our findings suggest that the Islamic Bank of Britain (IBB) and Bosna Bank International (BBI) are technically inefficient compared to small and large Islamic banks in Muslim countries and small conventional banks in the UK and Bosnia (BiH) respectively. Banks' inefficiency, by and large, stems from inefficient management compared with small Islamic banks. In comparison with large Islamic banks, the relative inefficiency of IBB and BBI becomes rather scale in nature. In comparison with small conventional banks, the non-optimal size of operations becomes more significant to explain the relative inefficiency of BBI, but in case of IBB the poor management plays more considerable impact on its inefficiency.

Our findings indicate that the BBI displays, despite its inefficiency, higher average efficiency scores than IBB, and thus is better able to operate closer to the efficient frontier. IBB, in contrast to BBI, exhibits not only lower efficiency scores, but also unstable trends in its overall performance. Specifically, while the bank provides a strong growth potential by recording a sustained upward trend in estimated efficiency as compared with other Islamic banks, it strikingly, shows a negative trend in efficiency levels over the sample period as compared with conventional banks.

Results pertaining to the Malmquist Productivity Index indicate that the BBI yields a positive growth in total factor productivity, mainly due to the progress in technical efficiency. The bank also achieves an impressive technological-(innovation) progress. This trend subsequently reverses, apparently because of the adverse market conditions. In contrast, IBB, as well as Islamic banking sector, suffers a negative growth in total factor productivity, driven, to a large extent, by the regress in banks' innovation. Findings further reveal that, in contrast to the entire Islamic banking sector, both, IBB and BBI, experience a remarkable growth in technical efficiency prior to the 2007 crisis, but they are exposed to a significant decline after the emergence of the crisis, primarily due to a lack of management skills. Nevertheless, on average,

IBB and BBI produce overall better substantial growth in technical efficiency compared to some other Islamic banks.

In comparison with conventional banks in the BiH banking sector, BBI gradually loses its superiority in both total factor productivity and technical efficiency, but still retains a high mean growth rate in both indices over the years. Overall, the improvements in management practices appear to be a less important source for further growth in the BBI's technical efficiency as compared to the optimal size component. Moreover, compared to conventional banks in the UK, IBB records higher average deterioration in total factor productivity growth driven by the bank's average (mean values at the end of 4-sample years) innovation regress. However, a continuing upward trend is found in the IBB's innovation over time. In terms of technical efficiency changes, IBB is lagging behind its counterparties banks, mainly due to inferior management.

In terms of the DEA-second stage analysis, findings illustrate that the more efficient Islamic banks are larger in size, have greater profit potential, acquire lower levels of debt and have increased investment in required skills. Furthermore, a more efficient use of banks resources is highly associated with a higher GDP-per capita.

Appendix-Ch.5:

Table 5.2.1-5.2.4: DEA-efficiency scores: IBB & BBI relative to Islamic banks in Muslim countries and conventional banks in the UK & BiH.

Table 5.2.1
DEA-Efficiency scores: IBB & BBI in comparison with small Islamic banks from Muslim countries (Model-M1).

Year	Country	The Bank	crste	vrste	scale	rts
2005	B iH	BBI	0.241	0.243	0.991	irs
2005	U.K	IBB	0.307	0.307	0.999	-
2005	Azerbaijan	Kauther bank	0.347	1.000	0.347	irs
2005	Qatar	Qatar International Islamic Bank	0.695	1.000	0.695	drs
2005	Bahrain	Khaleeji Commercial Bank	1.000	1.000	1.000	-
2005	Bahrain	Bahrain Islamic Bank	1.000	1.000	1.000	-
2005	Bahrain	Shamil Bank	0.453	0.497	0.912	drs
2005	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2005	U.A.E	Sharjah Islamic Bank	0.975	1.000	0.975	drs
2005	Malaysia	RHB	0.790	0.790	1.000	-
2005	Malaysia	CIMB	0.055	0.055	0.998	-
2005	Turkey	Albaraka Turk	0.621	0.761	0.816	drs
2005	Turkey	Kuveyt Turk	0.626	0.893	0.702	drs
2005	Kwuait	Boubyan Bank	0.893	0.898	0.994	drs
2006	BiH	BBI	0.343	0.345	0.994	irs
2006	U.K	IBB	0.285	0.306	0.931	drs
2006	Azerbaijan	Kauther bank	0.645	1.000	0.645	irs
2006	Qatar	Qatar International Islamic Bank	1.000	1.000	1.000	-
2006	Bahrain	Khaleeji Commercial Bank	0.985	0.986	0.999	irs
2006	Bahrain	Bahrain Islamic Bank	0.596	0.596	0.999	-
2006	Bahrain	Shamil Bank	0.591	0.625	0.946	drs
2006	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2006	U.A.E	Sharjah Islamic Bank	0.837	0.926	0.904	drs
2006	Malaysia	RHB	0.889	1.000	0.889	drs
2006	Malaysia	CIMB	0.629	0.632	0.996	irs
2006	Turkey	Albaraka Turk	0.657	0.820	0.801	drs
2006	Turkey	Kuveyt Turk	0.691	0.986	0.701	drs
2006	Kwuait	Boubyan Bank	0.806	0.841	0.959	drs
2007	BiH	BBI	0.483	0.485	0.996	irs
2007	U.K	IBB	0.369	0.381	0.968	drs
2007	Azerbaijan	Kauther bank	1.000	1.000	1.000	-
2007	Qatar	Qatar International Islamic Bank	1.000	1.000	1.000	-
2007	Bahrain	Khaleeji Commercial Bank	1.000	1.000	1.000	-
2007	Bahrain	Bahrain Islamic Bank	0.635	0.671	0.947	drs
2007	Bahrain	Shamil Bank	0.658	0.706	0.932	drs
2007	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2007	U.A.E	Sharjah Islamic Bank	0.761	0.879	0.866	drs
2007	Malaysia	RHB	0.612	0.845	0.724	drs
2007	Malaysia	CIMB	0.246	0.355	0.692	drs
2007	Turkey	Albaraka Turk	0.646	0.934	0.691	drs
2007	Turkey	Kuveyt Turk	0.629	0.948	0.663	drs
2007	Kwuait	Boubyan Bank	0.721	0.858	0.840	drs
2008	BiH	BBI	0.438	0.439	0.998	irs
2008	U.K	IBB	0.397	0.401	0.990	drs
2008	Azerbaijan	Kauther bank	0.918	1.000	0.918	irs
2008	Qatar	Qatar International Islamic Bank	0.871	1.000	0.871	drs
2008	Bahrain	Khaleeji Commercial Bank	0.852	1.000	0.852	drs
2008	Bahrain	Bahrain Islamic Bank	0.522	0.758	0.689	drs
2008	Bahrain	Shamil Bank	0.811	1.000	0.811	drs
2008	Bahrain	Abc Islamic Bank	1.000	1.000	1.000	-
2008	U.A.E	Sharjah Islamic Bank	0.820	1.000	0.820	drs
2008	Malaysia	RHB	0.585	0.863	0.678	drs
2008	Malaysia	CIMB	0.549	1.000	0.549	drs
2008	Turkey	Albaraka Turk	0.675	1.000	0.675	drs
2008	Turkey	Kuveyt Turk	0.626	1.000	0.626	drs
2008	Kwuait	Boubyan Bank	0.671	0.981	0.684	drs

Table 5.2.2
DEA-Efficiency scores: IBB & BBI in comparison with large Islamic banks from Muslim countries (Model-M2).

Year	Country	The Bank	crste	vrste	scale	rts
2005	BiH	BBI	0.329	1.000	0.329	irs
2005	U.K	IBB	0.326	1.000	0.326	irs
2005	Qatar	Qatar Islamic Bank	0.969	0.982	0.986	irs
2005	Kuwait	Kuwait Finance House	0.848	0.880	0.963	drs
2005	Bahrain	Albaraka Islamic bank	0.512	0.514	0.998	irs
2005	K.S.A	Bank Albilad	0.691	0.717	0.963	irs
2005	K.S.A	Al Rajhi Bank	1.000	1.000	1.000	-
2005	K.S.A	Aljazira	0.715	0.736	0.971	drs
2005	U.A,E	Emirates Islamic Bank	0.771	0.822	0.937	irs
2005	U.A.E	DIB	1.000	1.000	1.000	-
2005	Malaysia	Bank Islam	0.682	0.691	0.987	irs
2006	BiH	BBI	0.379	1.000	0.379	irs
2006	U.K	IBB	0.321	0.658	0.488	irs
2006	Qatar	Qatar Islamic Bank	1.000	1.000	1.000	-
2006	Kuwait	Kuwait Finance House	0.741	0.816	0.908	drs
2006	Bahrain	Albaraka Islamic bank	0.590	0.591	0.998	irs
2006	K.S.A	Bank Albilad	0.512	0.518	0.989	irs
2006	K.S.A	Al Rajhi Bank	1.000	1.000	1.000	-
2006	K.S.A	Aljazira	1.000	1.000	1.000	-
2006	U.A,E	Emirates Islamic Bank	0.814	0.837	0.973	irs
2006	U.A.E	DIB	0.882	0.914	0.966	drs
2006	Malaysia	Bank Islam	0.513	0.520	0.988	irs
2007	BiH	BBI	0.471	0.854	0.552	irs
2007	U.K	IBB	0.360	0.700	0.515	irs
2007	Qatar	Qatar Islamic Bank	0.956	0.966	0.989	irs
2007	Kuwait	Kuwait Finance House	0.969	1.000	0.969	drs
2007	Bahrain	Albaraka Islamic bank	0.641	0.648	0.989	drs
2007	K.S.A	Bank Albilad	0.469	0.472	0.994	irs
2007	K.S.A	Al Rajhi Bank	1.000	1.000	1.000	-
2007	K.S.A	Aljazira	0.448	0.487	0.920	drs
2007	U.A,E	Emirates Islamic Bank	0.774	0.787	0.984	irs
2007	U.A.E	DIB	0.831	0.854	0.973	drs
2007	Malaysia	Bank Islam	0.468	0.472	0.992	irs
2008	BiH	BBI	0.475	0.646	0.736	irs
2008	U.K	IBB	0.394	0.869	0.453	irs
2008	Qatar	Qatar Islamic Bank	1.000	1.000	1.000	-
2008	Kuwait	Kuwait Finance House	0.834	1.000	0.834	drs
2008	Bahrain	Albaraka Islamic bank	0.592	0.618	0.958	drs
2008	K.S.A	Bank Albilad	0.460	0.461	0.996	irs
2008	K.S.A	Al Rajhi Bank	0.918	1.000	0.918	drs
2008	K.S.A	Aljazira	0.400	0.401	0.998	irs
2008	U.A,E	Emirates Islamic Bank	0.824	0.826	0.998	irs
2008	U.A.E	DIB	0.665	0.667	0.996	drs
2008	Malaysia	Bank Islam	0.450	0.452	0.996	irs

Table 5.2.3
DEA efficiency scores:-(BBI) relative to small conventional banks in BiH (Model-M3)

Year	The bank	crste	vrste	scale	rts
2005	BBI	0.559	0.776	0.719	irs
2005	VAKUFSKA BANKA	0.647	0.780	0.829	irs
2005	ABS BANKA DD SARAJEVO	0.619	0.737	0.840	drs
2005	Investiciono-komercijalna	0.501	1.000	0.501	irs
2005	ProCredit Bank	0.818	1.000	0.818	drs
2005	Balkan Investment bank	0.993	1.000	0.993	irs
2005	Turkish Ziraat Bank Bosnia d.d.	1.000	1.000	1.000	-
2006	BBI	0.705	1.000	0.705	irs
2006	VAKUFSKA BANKA	0.565	0.645	0.875	irs
2006	ABS BANKA DD SARAJEVO	0.678	0.809	0.838	drs
2006	Investiciono-komercijalna	0.612	1.000	0.612	irs
2006	ProCredit Bank	0.768	1.000	0.768	drs
2006	Balkan Investment bank	0.823	0.963	0.854	irs
2006	Turkish Ziraat Bank Bosnia d.d.	1.000	1.000	1.000	-
2007	BBI	0.886	1.000	0.886	irs
2007	VAKUFSKA BANKA	0.653	0.716	0.912	irs
2007	ABS BANKA DD SARAJEVO	0.879	1.000	0.879	drs
2007	Investiciono-komercijalna	0.782	1.000	0.782	irs
2007	ProCredit Bank	0.699	1.000	0.699	drs
2007	Balkan Investment bank	1.000	1.000	1.000	-
2007	Turkish Ziraat Bank Bosnia d.d.	0.667	0.700	0.952	drs
2008	BBI	0.908	0.976	0.930	irs
2008	VAKUFSKA BANKA	0.841	0.894	0.941	irs
2008	ABS BANKA DD SARAJEVO	1.000	1.000	1.000	-
2008	Investiciono-komercijalna	1.000	1.000	1.000	-
2008	ProCredit Bank	0.623	1.000	0.623	drs
2008	Balkan Investment bank	1.000	1.000	1.000	-
2008	Turkish Ziraat Bank Bosnia d.d.	0.984	0.984	1.000	-

Table 5.2.4
DEA efficiency scores: (IBB) relative to small conventional banks in UK (Model-M4)

Year	The bank	crste	vrste	scale	rts
2005	IBB	1.000	1.000	1.000	-
2005	Turkish Bank (UK)	0.893	0.916	0.975	irs
2005	ICBC London Limited	1.000	1.000	1.000	-
2005	Habib Allied INT. Bank	0.873	0.905	0.966	drs
2005	Ghana INT. Bnak	1.000	1.000	1.000	-
2005	Bank of Beirut(UK)Ltd	0.964	1.000	0.964	irs
2005	Bank Leumi UK	0.896	0.993	0.902	drs
2006	IBB	0.825	0.901	0.916	drs
2006	Turkish Bank (UK)	0.860	0.878	0.980	irs
2006	ICBC London Limited	0.990	1.000	0.990	irs
2006	Habib Allied INT.	0.906	0.948	0.955	drs
2006	Ghana INT. Bnak	1.000	1.000	1.000	-
2006	Bank of Beirut(UK)Ltd	0.670	0.899	0.746	irs
2006	Bank Leumi UK	0.949	1.000	0.949	drs
2007	IBB	0.815	0.898	0.908	drs
2007	Turkish Bank (UK)	0.860	0.860	1.000	-
2007	ICBC London Limited	1.000	1.000	1.000	-
2007	Habib Allied INT. Bank	0.938	0.978	0.959	drs
2007	Ghana INT. Bnak	1.000	1.000	1.000	-
2007	Bank of Beirut(UK)Ltd	0.774	0.847	0.913	irs
2007	Bank Leumi UK	0.964	1.000	0.964	drs
2008	IBB	0.789	0.856	0.922	drs
2008	Turkish Bank (UK)	0.947	0.997	0.949	irs
2008	ICBC London Limited	1.000	1.000	1.000	-
2008	Habib Allied INT. Bank	0.938	0.977	0.960	drs
2008	Ghana INT. Bnak	0.884	1.000	0.884	drs
2008	Bank of Beirut(UK)Ltd	1.000	1.000	1.000	-
2008	Bank Leumi UK	0.973	1.000	0.973	drs

Table 5.3.1- 5.3.4 :
MPI-Productivity growth: IBB & BBI in comparison to small Islamic banks in Muslim countries and in Europe.*

Table 5.3.1
Banks Total Factor productivity change (TFPch) between 2005–08

Country**	Banks	Age***	05-06	06-07	07-08	MEAN
BiH	BBI	**9**	1.423	1.447	0.873	**1.248**
UK	IBB	**6**	0.917	1.050	0.925	**0.964**
Azerbaijan	Kauther bank	**7****	1.262	1.839	0.803	**1.301**
Turkey	Albaraka Turk	26	1.037	1.037	1.046	**1.040**
Turkey	Kuveyet Turk	22	1.101	0.932	1.010	**1.014**
Qatar	QIIB	20	1.385	1.034	0.812	**1.077**
Bahrain	KHCB	**6**	0.925	1.077	0.799	**0.934**
Bahrain	BisB	32	0.664	1.092	0.846	**0.867**
Bahrain	Shamil bank	29	1.261	1.169	1.173	**1.201**
Bahrain	ABC Islamic	24	0.711	0.288	0.987	**0.662**
Bahrain	SIB	35	0.926	0.877	1.073	**0.959**
Kuwait	Boabyan bank	**7**	0.998	0.854	0.921	**0.924**
Malaysia	RHB	**6**	1.050	0.406	0.944	**0.800**
Malaysia	CIMB	**8**	1.219	0.413	1.107	**0.913**
MEAN			**1.063**	**0.965**	**0.951**	**0.993**

Table 5.3.2
Banks technological efficiency change (TECch)) between 2005-2008

Country	Banks	05-06	06-07	07-08	MEAN
BiH	BBI	1.412	0.721	0.954	**1.029**
UK	IBB	0.683	0.495	0.928	**0.702**
Azerbaijan	Kauther bank	1.508	1.839	0.803	**1.383**
Turkey	Albaraka Turk	1.420	0.845	0.932	**1.066**
Turkey	Kuveyet Turk	1.303	0.851	0.919	**1.024**
Qatar	QIIB	1.385	1.034	0.812	**1.077**
Bahrain	KHCB	0.925	1.077	0.799	**0.934**
Bahrain	BisB	1.022	0.966	0.800	**0.929**
Bahrain	Shamil bank	1.476	1.066	0.853	**1.132**
Bahrain	ABC Islamic	0.711	0.288	0.987	**0.662**
Bahrain	SIB	0.958	0.913	0.997	**0.956**
Kuwait	Boabyan	1.126	1.017	0.810	**0.984**
Malaysia	RHB	1.050	0.594	0.974	**0.873**
Malaysia	CIMB	1.122	1.341	0.961	**1.141**
MEAN		**1.150**	**0.932**	**0.895**	**0.992**

Table 5.3.3
Banks technical efficiency change (TEch)) between 2005-2008

Country	Banks	05-06	06-07	07-08	MEAN
BiH	BBI	1.007	1.078	0.915	**1.000**
UK	IBB	1.119	1.343	0.997	**1.153**
Azerbaijan	Kauther bank	1.500	1.000	1.000	**1.167**
Turkey	Albaraka Turk	0.730	1.226	1.122	**1.026**
Turkey	Kuveyet Turk	0.845	1.095	1.100	**1.013**
Qatar	QIIB	1.000	1.000	1.000	**1.000**
Bahrain	KHCB	1.000	1.000	1.000	**1.000**
Bahrain	BisB	0.650	1.131	1.058	**0.946**
Bahrain	Shamil bank	0.855	1.097	1.375	**1.109**
Bahrain	ABC Islamic	1.000	1.000	1.000	**1.000**
Bahrain	SIB	0.967	0.961	1.076	**1.001**
Kuwait	Boabyan bank	0.887	0.840	1.137	**0.955**
Malaysia	RHB	1.000	0.683	0.969	**0.884**
Malaysia	CIMB	1.861	0.308	1.193	**1.121**
MEAN		**1.030**	**0.983**	**1.067**	**1.027**

*TFPch = Total Factor Productivity Change; TEch = Technical Efficiency Change; TECch = Technological Efficiency Change; PTEch = Pure Technical Efficiency Change; and SEch = Scale Efficiency Change.

** Bosnia and Herzegovina (BiH) is a European country located on the Balkan Peninsula. Muslims in BiH constitute 45% or so of the population. Azerbaijan is the largest country in the South Caucasus region of *Eurasia*. According to a 2009 Pew Research Center report, 99.2% of the population is Muslim. Turkey is a Eurasian country. Islam is the dominant religion in Turkey. Nearly 97% of the people are Muslims.

*** Age has been calculated from the date of incorporation until the 1st of 2010.

****The bank has been working in Azerbaijan's banking sector since 1988.The previous name of the bank was 'Universal Bank'. It began to apply Islamic banking method on October 2002.

Table 5.3.4
Changes in technical efficiency components between 2005-2008

Country	Banks	05-06		06-07		07-08		MEAN	MEAN
		PTEch	SEch	PTEch	SEch	PTEch	SEch	PTEch	**SEch**
BiH	BBI	1.032	0.977	1.976	1.016	0.899	1.081	1.302	**1.025**
UK	IBB	1.347	0.997	1.901	1.002	0.998	0.999	1.415	**0.999**
Azerbaijan	Kauther	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Turkey	Albaraka.T	0.866	0.844	1.155	1.062	1.000	1.122	1.007	**1.009**
Turkey	KuveyetT	1.000	0.845	1.000	1.095	1.000	1.100	1.000	**1.013**
Qatar	QIIB	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Bahrain	KHCB	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Bahrain	BisB	0.651	0.998	1.141	0.991	1.047	1.011	0.946	**1.000**
Bahrain	Shamil	0.847	1.008	1.061	1.034	1.347	1.021	1.085	**1.021**
Bahrain	ABC	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Bahrain	SIB	1.000	0.967	1.000	0.961	1.000	1.076	1.000	**1.001**
Kuwait	Boabyan	0.894	0.992	1.073	0.783	1.024	1.110	0.997	**0.962**
Malaysia	RHB	1.000	1.000	0.975	0.700	0.885	1.095	0.953	**0.932**
Malaysia	CIMB	1.804	1.005	0.451	0.683	1.251	1.028	1.169	**0.905**
MEAN		**1.032**	**0.974**	**1.124**	**0.952**	**1.032**	**1.046**	**1.063**	**0.991**

Table 5.4 & 5.5.1-5.5.4:

Table 5.4.
Summary statistics of variables employed in the DEA analysis

Factor*	Min.**	Max.	Mean	St. Dev.
M1: Total Loans	0.003	15,67.810	513.343	434.834
M1:Total Revenues	0.110	263.530	59.558	59.432
M1: Total Expenses	0.100	16,768.770	33.305	2,236.673
M1:Total Staff Cost	0.016	698.570	21.476	92.534
M1: Total Deposits	0.580	3,172.440	655.458	612.139
M2: Total Loans	13.580	22,668.570	4,227.15	5,058.656
M2: Total Revenues	1.140	1823.300	411.448	494.593
M2: Total Expenses	1.760	1005.160	151.686	194.736
M2:Total Staff Cost	0.450	253.120	60.228	58.353
M2: Total Deposits	25.420	19,682.360	4,216.93	4,595.808
M3: Total Loans	31.430	290.090	100.91	71.045
M3: Total Revenues	3.240	38.460	14.422	9.243
M3: Total Expenses	4.680	39.040	11.297	8.564
M3:Total Staff Cost	0.190	16.580	4.460	4.188
M3: Total Deposits	0.890	289.300	104.16	63.304
M4:Total Loans	29.400	1,278.720	298.965	354.175
M4:Total Revenues	2.211	38.110	10.927	10.700
M4:Total Expenses	1.510	19.600	7.089	5.446
M4:Total Staff Cost	0.850	10.710	3.494	2.722
M4:Total Deposits	47.720	1,214.390	323.312	348.269

Table 5.5.1-5.5.4:
MPI-Productivity growth: BBI in comparison with small conventional banks in Bosnia and Herzegovina (BiH)

Table 5. 5.1
Banks Total Factor productivity change (TFPch) between 2005–08

Bank	2005-2006	2006-2007	2007-2008	MEAN
BBI	1.268	1.251	1.013	1.177
VAKUFSKA	0.859	1.109	1.141	1.036
ABS	1.136	1.204	1.150	1.163
Investiciono	1.243	1.180	1.968	1.464
Pro Credit	0.867	0.938	0.908	0.904
Balkan Inv.	0.504	1.938	0.888	1.110
Turkish Zira.	1.124	0.576	1.080	0.927
MEAN	**1**	**1.171**	**1.164**	**1.112**

Table 5.5.2
Banks technological efficiency change (TECch)) between 2005-2008

Bank	2005-2006	2006-2007	2007-2008	MEAN
BBI	1.052	1.223	1.074	1.116
VAKUFSKA	0.949	1.033	1.018	1
ABS	0.947	1.204	1.150	1.100
Investiciono	0.942	1.012	1.968	1.307
Pro Credit	0.867	1.102	1.097	1.022
Balkan Inv.	0.504	1.993	0.888	1.128
Turkish Zira.	1.124	0.576	1.080	0.927
MEAN	**0.912**	**1.163**	**1.182**	**1.086**

Table 5.5.3
Banks technical efficiency change (TEch) between 2005-2008

Bank	2005 2006	2006-2007	2007-2008	MEAN
BBI	1.206	1.023	0.943	1.057
VAKUFSKA	0.905	1.074	1.121	1.033
ABS	1.200	1.000	1.000	1.067
Investiciono	1.320	1.166	1.000	1.162
Pro Credit	1.000	0.851	0.828	0.893
Balkan Inv.	1.000	1.000	1.000	1
Turkish Zira	1.000	1.000	1.000	1
MEAN	**1.090**	**1.016**	**0.985**	**1.030**

Table 5.5.4
Changes in technical efficiency components between 2005-2008

Bank	2005- 2006		2006- 2007		2007- 2008		MEAN	MEAN
	PTEch	SEch	PTEch	SEch	PTEch	SEch	PTEch	SEch
BBI	1.000	1.206	1.000	1.023	1.000	0.943	1.000	1.057
VAKUFSKA	0.937	0.965	1.042	1.030	1.116	1.005	1.032	1.000
ABS	1.031	1.164	1.000	1.000	1.000	1.000	1.010	1.055
Investiciono	1.000	1.320	1.000	1.166	1.000	1.000	1.000	1.162
Pro Credit	1.000	1.000	1.000	0.851	1.000	0.828	1.000	0.893
Balkan Inv.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Turkish Zira	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
MEAN	**0.995**	**1.093**	**1.006**	**1.010**	**1.017**	**0.968**	**1.006**	**1.024**

*All numbers in are in Million £ after deflation.

** Kauther bank in Azerbaijan, BBI and IBB in Bosnia - Herzegovina 'BiH' and the UK respectively, are found to have the lowest value of outputs and inputs. This is simply due to the fact that these banks are newly established in Europe.

Table 5.6.1- 5.6.4 & 5.7:

Table 5.6.1-5.6.4 :

MPI-Productivity growth: IBB in comparison with small conventional banks in the UK.

Table 5.6.1.
Banks Total Factor productivity change (TFPch) between 2005–08

Bank	2005-2006	2006-2007	2007-2008	MEAN
IBB	0.784	0.906	0.934	0.875
Turkish Bank	0.966	1.012	1.050	1.009
ICBC London LT	1.029	1.291	0.854	1.058
Habib Allied	1.004	1.030	0.993	1.009
Ghana INT	1.009	1.013	0.971	0.998
Bank of Beirut (UK)	1.021	1.141	1.323	1.162
Bank leumi UK	1.028	1.008	1.006	1.014
MEAN	**0.977**	**1.057**	**1.019**	1.018

Table 5.6.2.
Banks technological efficiency change (TECch)) between 2005-2008

Bank	2005-2006	2006-2007	2007-2008	MEAN
IBB	0.784	0.906	1.008	0.899
Turkish Bank	0.904	0.971	1.045	0.973
ICBC London LT	1.029	1.291	0.854	1.058
Habib Allied	0.917	0.985	0.993	0.965
Ghana INT	1.009	1.013	1.095	1.039
Bank of Beirut (UK)	1.021	1.141	1.323	1.162
Bank leumi UK	1.031	1.004	1.006	1.014
MEAN	**0.956**	**1.044**	**1.046**	1.016

Table 5.6.3.
Banks technical efficiency change (TEch) between 2005-2008

Bank	2005-2006	2006-2007	2007-2008	MEAN
IBB	1.000	1.000	0.927	0.976
Turkish Bank	1.068	1.043	1.005	1.039
ICBC London LT	1.000	1.000	1.000	1.000
Habib Allied	1.095	1.045	1.000	1.047
Ghana INT	1.000	1.000	0.887	0.962
Bank of Beirut (UK)	1.000	1.000	1.000	1.000
Bank leumi UK	0.997	1.003	1.000	1.000
MEAN	**1.022**	**1.013**	**0.974**	1.003

Table 5.6.4
Changes in technical efficiency components between 2005-2008

Bank	05-06		06-07		07-08		MEAN	MEAN
	PTEch	SEch	PTEch	SEch	PTEch	SEch	PTEch	SEch
IBB	1.000	1.000	1.000	1.000	0.931	0.995	0.977	0.998
Turkish B.	1.092	0.978	1.000	1.043	1.000	1.005	1.031	1.009
ICBC London	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Habib Allied	1.028	1.065	1.041	1.004	1.000	1.000	1.023	1.023
Ghana INT	1.000	1.000	1.000	1.000	1.000	0.887	1.000	0.962
Bank of Beirut	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bank leumi	1.000	0.997	1.000	1.003	1.000	1.000	1.000	1.000
MEAN	**1.017**	**1.006**	**1.006**	**1.007**	**0.990**	**0.984**	**1.009**	**0.999**

Table 5.7
Summary statistics of the exogenous variables in the DEA- second stage/ the (OLS)-regression*

Exogenous variables	Measurement and *expected* effect on efficiency
β_1 *PBjt*(ROA)(E1,E2)	Profitability=net income to total assets. (+)**
β_2 *PERjt* (E1,E2)	Personal expenses as a proxy of skills utilization measured by total amount of wages and salaries to total assets. (-): efficient banks are expected to have lower cost because of IT.
β_3 *LIQjt* (E1,E2)	Liquid assets to total deposits and short term funding as a proxy of liquid asset ratio. (+ or -)
β_4 *lOG(AS)jt* (E1,E2)	(Log.)Total assets as a proxy of bank's size. (+)
β_5 *LTAjt* (E1,E2)	The proxy of lending intensity= total loans to total asset. (+): loans are the main source of revenue.
β_6 *DEPOjt* (E1,E2)	Total deposits the proxy of market share. (+): they are considered the main source of progress.
β_7 *INDjt* (E1,E2)	The effect of independency. Dummy variable; (1) if a bank is managed by a parents(subsidiary), (0) if it is stand alone bank. (+ or -)
β_8 *AGEjt* (E1,E2)	The effect of age and experience. Dummy variable; (1) if <10 years, (0) otherwise. (+)
β_9 *LEVjt* (E1,E2)	Leverage= total assets to equity. (-)
β_{10} *GDPjt* (E1)	The percentage change in gross domestic production per capita (favorable economic condition will affect positively on demand and supply of banking services).(+ or -)
β_{11} *GEOjt* (E1)	Geographical location effect. Dummy variable; (1) if the bank is located in Europe; = (0) otherwise. (+): Islamic banks in Muslim countries are more Efficient.
β_{11}DIVER*jt* (E2)	Diversification effect. Dummy variable; (1) if high diversified, (0) otherwise (+): unless it leads to higher risk.

* i) One of the important assumptions underlying the OLS regression method is that the explanatory variables are (linearly independent). As a rule of thumb if $r \geq 0.70$ between variables they should not both appear in the equation. To test for Autocorrelation (except for dummies), we use: Tolerance, VIF and Durbin-Watson statistics. As a result of the test using (SPSS-17) it is clear that the Tolerance is >0.20, VIF <5, and the D-W is around (very close) to (2) which indicates the absence of Autocorrelation, and thus ,the Multi-co linearity does not appear to be a serious problem.

ii) We apply the Scatter plots and Skewness statistics to test for both linearity and normality. As a rule of thumb, $|s| > 1$ indicates potentially serious non-normality. We find that these assumptions have almost certainly been met. However, when nonlinear relationships are thought to be present, investigators typically seek to model them in a manner that permits them to be transformed into linear relationships.

iii) Despite the fact that the multiple regression procedures are not greatly affected by minor deviations from the assumptions of linearity and normality (normal distribution contains only linear relationships between variables) of data, we use non-linear transformation (Logarithm Transformation for all variables, except dummies) to meet the previous main assumptions and to produce more accurate results.

iv) In order to get rid the negative values for a variable, we added a constant to move the minimum value of the distribution above 0, preferably to 1.00. Hence, we use log+4 in our analysis to transfer the logarithms results to positive numbers.

vi) For the original data values that include negative numbers, it is not possible to apply many nonlinear transformations (the log of a negative number is undefined). In this situation we added a constant to all data values that make them positive. As a rule of thumb, we add the smallest constant that will convert the largest negative data value to a value greater than 1.

v) Our OLS-regression analysis shows a strong correlation between the observed values of the response variables and the values predicted by the model (all models) ($R^2 > 60\%$). Eventually, using the ANOVA Tables, we clearly reject the null hypothesis and conclude that at least one of the predictors is related to the efficiency scores. This means that the models have been estimated are not only theoretically construct but exists and statistically significant (i.e. M1, $F_{13, 42}$=3.419, P<.001, M2, $F_{11, 32}$ = 1.572, P<.001, in M3, $F_{10, 17}$=1.505, P<0.10, and in M4, F11, 16=4.128, P<.001).

** (+) indicates a positive effect, (-) indicates a negative effect, (0) indicates (No) effect.

Fig. 5.1-5.4: Mean DEA-efficiency scores by individual bank: model-M1, M2, M3, and M4.

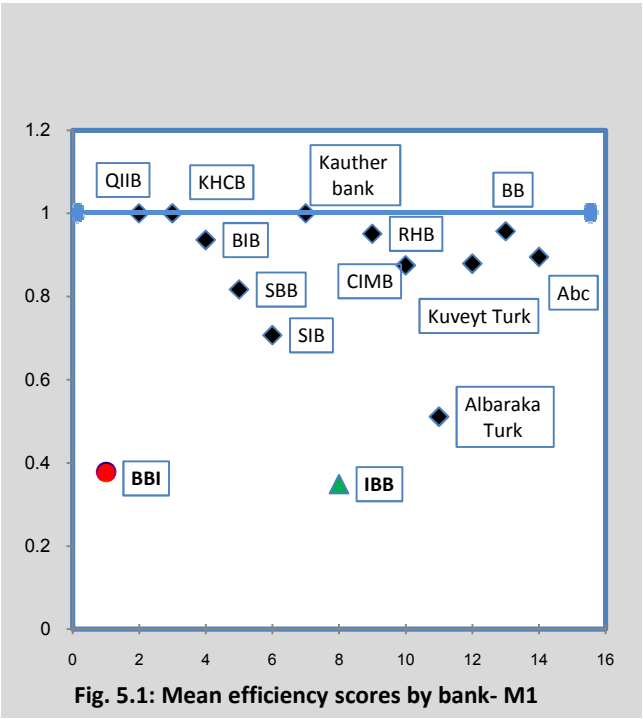


Fig. 5.1: Mean efficiency scores by bank- M1

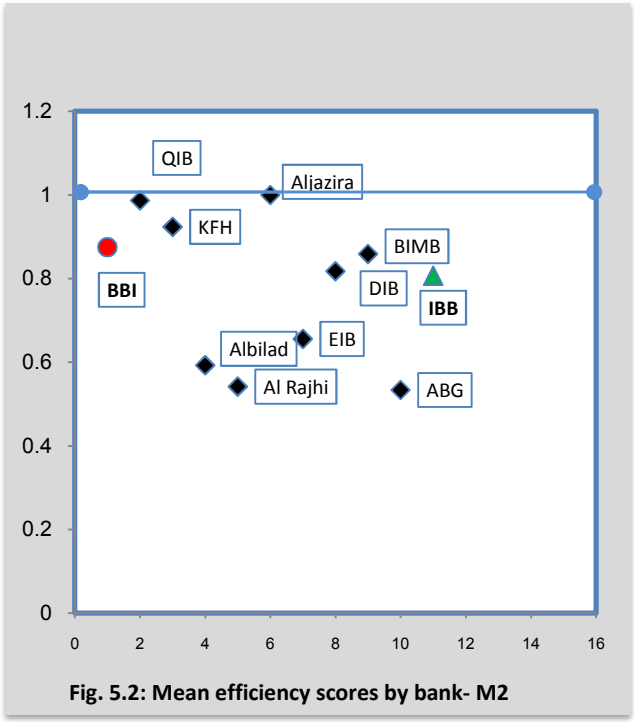


Fig. 5.2: Mean efficiency scores by bank- M2

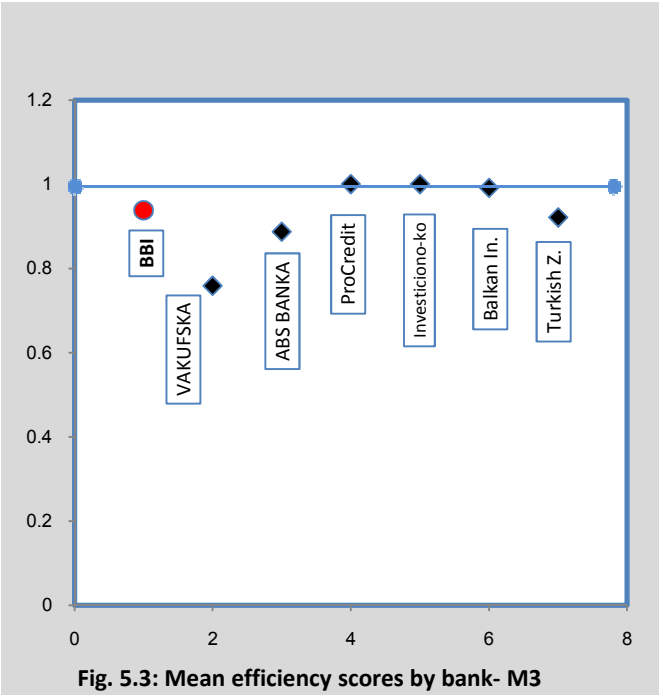


Fig. 5.3: Mean efficiency scores by bank- M3

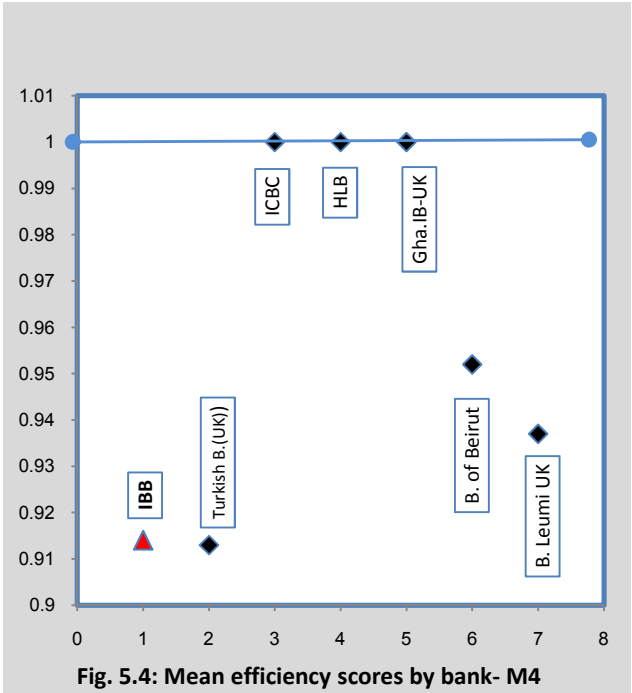


Fig. 5.4: Mean efficiency scores by bank- M4

References

Abdul-Majid, M. and Saal, D., and Battisti, G. (2008) 'Efficiency in Islamic and conventional banking: an international comparison', Journal of Productivity Analysis, Vol. 34, No. 1 pp. 25-43

Alirezaee, M., Howland, M., and van de Panne, C. (1998) 'Sampling size and efficiency bias in data envelopment analysis', Journal of Applied Mathematics and Decision Sciences, Vol. 2, No.1, pp.51-64.

Ariff, M. (1988) 'Islamic Banking', Asian-Pacific Economic Literature, Vol. 2 No. 2, pp.48–64.

Ataullah, A., Cockerill, T. and Le, H. (2004) 'Financial Liberalization and Bank Efficiency: Comparative Analysis of India and Pakistan', Applied Economics, Vol. 36 No. 17, pp.1915-1924.

Banker, R.D., Charnes, A. and Cooper, W.W. (1984) 'Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis', Management Science, Vol. 30, No.9, pp.1078-92

Berger, A. N., Hunter, W. C., and Timme, S. G. (1993) 'The efficiency of financial institutions: A review and preview of research past, present and future', Journal of Banking and Finance, Vol.17, No. 2&3, pp. 221–250.

Berger, A.N. and Humphrey, D.B. (1997) 'Efficiency of Financial Institutions: International Survey and Directions for Future Research', European Journal of Operational Research, Elsevier, Vol. 98 No.2, pp. 175-212.

Caves, D. W., Cristensen, L. R. and Diewert, W. E. (1982) 'The economic theory of index numbers and the measurement of input, output and productivity', Econometrica, Vol. 50 No.6, pp. 1393–1414.

Charnes, A., Cooper, W. W. and Rhodes, E. (1978) 'Measuring the efficiency of decision making units', European Journal of Operational Research, Vol. 2 No.6, pp. 429–444.

Čihák, M. and Hesse, H.(2008),'Islamic Banks and Financial Stability: An Empirical Analysis', International Monetary Fund Working Paper no. 08/16. Available at: http://www.imf.org/external/pubs/ft/wp/2008/wp0816.pdf (accessed 20 Feb. 2011).

Coelli T.J. (1996) 'A guide to DEAP Version 2.1: A Data Envelopment Analysis (Computer) Program', Working Papers no. 96/08, Centre for Efficiency and Productivity Analysis (CEPA). Available at: http://www.owlnet.rice.edu/~econ380/DEAP.PDF (accessed 20 Sep. 2010).

Coelli T.J. (1998) 'A Multi-stage Methodology for the solution of orientated DEA models', Operations Research Letters, Vol. 23 No. 3-5, pp. 143-149.

Cooper, W. W., Seiford, L. M., and Tone, K. (2007) 'Data Envelopment Analysis: A comprehensive Text with Models, Applications. References and DEA-Solver Software', 2nd edition, Springer. New York

Cubbins, J. and Tzanikadis, G. (1998) 'Regression versus Data Envelopment Analysis for efficiency measurement: An application to the England and Wales regulated water industry', Utilities Policy, Vol. 7 No. 2, pp.75-85.

Darrat, F., Topuz, C., and Yousef, T. (2002) 'Assessing Cost and Technical Efficiency of Banks in Kuwait', Presentation to the Economic Research Forum's 8th Annual Conference in Cairo (January). Available at: http://www.erf.org.eg/CMS/uploads/pdf/1194082688_Assessingcost-Darrat&Yousef.pdf (accessed 14 Feb.2011).

Färe, R., Grosskopf, S., Lindgren, B. and Roos, P. (1989) 'Productivity developments in Swedish hospital: A Malmquist output index approach', In A. Charnes, W. W. Cooper, A. Lewin, and L. Seiford (Eds.), Data Envelopment Analysis: Theory, methodology and application,253-272, . Kluwer Academic Publishers, Boston.

Färe, R., Grosskopf, S., Lindgren, B., Roos, P. (1992) 'Productivity change in Swedish pharmacies 1980–1989: A non-parametric Malmquist approach', Journal of Productivity Analysis, Vol. 3 No.2, pp. 85–102.

Färe, R., S. Grosskof, S., Norris M., & Zhang, Z. (1994) 'Productivity Growth, Technical Progress and Efficiency Change in Industrialized Countries', American Economic Review, Vol. 84 No.1, pp. 66-83.

Johnes, J., Abdu Izzeldin, M. and Pappas, V. (2007) 'Efficiency in Islamic and conventional banks: A comparison based on financial ratios and data envelopment analysis', WP from Lancaster University Management School. Available at: http://www.lums.lancs.ac.uk/files/Efficiency.pdf (accessed 15 Feb. 2011)

Hassan, K. (2005) 'The Cost, Profit and X-Efficiency of Islamic Banks', presented at ERF's (Economic Research forum) 12th Annual Conference, Cairo, Egypt. Available at: http://www.erf.org.eg/CMS/uploads/pdf/1184492515_Kabir_Hassan.pdf (accessed 2 Sep. 2010)

Hussein, K.A. (2003) 'Operational Efficiency in Islamic Banking: The Sudanese Experience', Working Paper No. 1, Islamic Research and Training Institute (IRTI), Islamic Development Bank.

Kumbhakar, S. Lovell, C.A.K. (2000). 'Stochastic frontier analysis', Cambridge England: Cambridge University Press.

La Forgia, G. M. and Couttolenc, B. (2008) 'Hospital performance in Brazil: the search for excellence', World Bank Publications, Washington.

Limam, I. (2001) 'Measuring Technical Efficiency of Kuwait Banks', API-Working Paper Series 0101, Arab Planning Institute - Kuwait, Information Center. Available at: http://www.arab-api.org/wps/wps0101.htm (accessed 23 March. 2011)

McDonald, J. (2009) 'Using least squares and tobit in second stage DEA efficiency analyses', European Journal of Operational Research, Vol.197 No.2, pp. 792-798.

Omar, M. A., Abdul Rahman, A., Mohd. Yusof, R., Abd. Majid, M. S. and Rashid, M. E. (2006) 'Efficiency of commercial banks in Malaysia: A DEA approach', Journal of Accounting and Finance, Vol. 2 No.2, pp. 19-41

Rosly, S.A., Abu Bakar, M.A. (2003) 'Performance of Islamic and Mainstream Banks in Malaysia', International Journal of Social Economics. Vol. 30 No.12, pp. 1249-1265.

Ross S. (1977) 'The Determination of Financial Structure: The Incentive Signaling Approach', Bell Journal of Economics, Vol. 8 No. 1, pp. 23-40.

Samad, A. (2004) 'Performance of Interest-Free Islamic Banks vis-a-vis Interest-Based Conventional Banks of Bahrain', IIUM Journal of Economics and Management, Vol.12 No. 2, pp.1-15

Sole, J. (2007) 'Introducing Islamic Banks into Conventional Banking Systems', IMF-WP 07/175. Available at: http://www.imf.org/external/pubs/ft/wp/2007/wp07175.pdf (accessed 2 Feb. 2010).

Sufian, F. (2006) 'Size and Returns to Scale of the Islamic Banking Industry in Malaysia: Foreign Versus Domestic Banks', IIUM Journal of Economics and Management, Vol. 14 No.2, pp. 147-175.

Sufian, F. (2007) 'Malmquist indices of productivity change in Malaysian Islamic banking industry: foreign versus domestic banks', Journal of Economic Corporation, Vol. 28 No.1, pp.115-150.

Sufian, F., A., Majid A. and M., Zulkhibri, (2008) 'Bank Ownership, Characteristics, and Performance: A Comparative Analysis of Domestic and Foreign Islamic Banks in Malaysia', J.KAU: Islamic Econ., Vol. 21 No.2, pp.3-37

Yudistira, D. (2004) 'Efficiency of Islamic Banks: an Empirical Analysis of 18 Banks', Islamic Economic Studies. Vol. 12 No. 1.

Yotopoulos, P.A., Lau, L.J. (1973) 'A Test for Relative Economic Efficiency: Some Further Results', American Economic Review, Vol. 63, No.1, pp. 214 - 223.

Chapter 6

Empirical analysis: Part-3/ *Jointly with Burghof, H-P. & Khan, W.*

X-efficiency and financial performance of Islamic versus conventional banks: evidence from Europe

6.1. The abstract

In this chapter we employ data envelopment analysis (DEA) to examine the relative efficiency of Islamic and conventional banks in the UK and Switzerland during 2008-2009, accounting ratio analysis to measure the financial performance of the European Islamic Investment Bank (EIIB) during 2005-2008, and a matched-pairs t-test to determine the differences in the EIIB performance in the pre-versus post financial crisis periods, respectively.

Results suggest that the Islamic banks in Europe experience lower cost efficiency, higher allocative inefficiency and poor, but relatively better, technical efficiency compared to conventional banks. The inefficiency of the banks is caused largely by the choices of inputs price mix and appears to be mostly due to their non-optimal size of operations. Findings further show that the EIIB exhibits a clear paradox between its high operating efficiency and low profitability. EIIB gradually became illiquid but still remains solvent. The bank's Murabaha products (Mark-up loans) appear to be the most dominant among other modes of finance. A comparison of the bank's performance in the periods before and after the crisis does not show statistically significant differences.

6.2. Introduction

Before the evolution of Islamic finance, Muslim countries had been utilizing only conventional financial institutions to fulfill financial needs. The growing awareness of Islamic finance in the late 1960's ignited the need for a financial system that allows Muslims to transact in line with their religious beliefs and in compliance to Islamic law that is totally distinct itself from the conventional banking system in terms of interest prohibitions. This led to the establishment of a number of Islamic banks concentrated in the Muslims countries, especially in the Gulf Cooperation Council (GCC)-States and Malaysia. To keep pace with the growing demand for Islamic financial products many Islamic countries issued licenses to foreign banks, allowing them to offer Islamic services and products. Recently, the Islamic financial system has broadened its reach from Muslim financial markets to European countries.

The emergence of a fast-paced business environment in the financial services sector has highlighted the significance of competition and efficiency among Islamic and conventional banks. Regardless of a bank's underlying principles (Islamic or conventional), its long-term sustainability depends on its efficiency performance. A bank is said to be economically efficient if it is technically and price efficient (Richard and Villanueva, 1980). It is, however, possible for a bank to be technically efficient but not price efficient. Given the quantity and price of outputs and inputs, (cost) X-efficiency can be estimated. X-efficiency describes the resulting differences between actual and minimum cost (Leibenstein, 1966). In a competitive environment, a bank is considered as X-efficient if it systematically incurs lower cost relative to other banks. X-inefficiency is usually defined as deviations from an efficient frontier response surface that is attributable to a misallocation of resources or the lack of effective utilization of current resources (Anderson, Fok, Zumpano, and Elder, 1998). The study of X-efficiency is believed to be important as Berger, Hunter and Timme (1993) find that X-inefficiencies account for 20% or more of banking costs. Consequently, the analysis of X-efficiency of Islamic banks becomes vital not only in Muslim financial markets but also in Europe as there appears to be no study in the literature on the X-efficiency of Islamic banks.

In this chapter, our primary empirical strategy is to measure the X-efficiency of Islamic investment, wholesale and private banks which are currently operating in Europe. The chapter also offers a preliminary empirical assessment of the financial performance of Islamic investment

banks. To this end, a two-part analysis was applied. In the first part, we undertake a comparative study of the X-efficiency levels of four Islamic investment, wholesale and private banks from UK and Switzerland relative to conventional banks. We utilize the DEA-approach to calculate X-efficiency measures: allocative efficiency (AE), technical efficiency (TE), pure technical efficiency (PTE), scale efficiency (SE), and cost efficiency (CE) over the period 2008-2009. In the second part, we examine the financial performance of the *first independent Islamic investment bank in Europe*, the European Islamic Investment Bank (EIIB). This particular analysis covers the period from 2005 to 2008. In evaluating the bank's performance, we empirically apply various well-known financial ratios: profitability, liquidity, risk and solvency, and efficiency. To determine the difference of the bank's performance in the period before and after the financial crisis commencing in 2007, we employ inter-temporal analysis using the difference-of-means tests (t-test).

The importance of our study comes from different operating points of view. First, it demonstrates the expansion potentials and the ability of Islamic banks to achieve their optimum efficiency and profitability level in a mixed banking system in Europe. Second, it will have policy implications for Islamic banks on improving cost efficiency and performance. The rest of this chapter is structured as follows. Section 2 is a review of literature. Section 3 discusses methodology. Section 4 offers the results. Finally, section 5 presents the conclusions.

6.3. Literature review

Numerous empirical studies have been undertaken on conventional banking efficiency. Although efficiency is highly recognized in Islam, the available studies on Islamic banking focus on conceptual studies rather than empirical issues. This is due to the small number of Islamic financial institutions relative to the conventional peers, the small size of existing Islamic banks, and the novelty of the concept of Islamic banking in practice. With the tremendous growth of Islamic banking around the world, and due to the fact that Islamic banks differ from conventional banks in their cost, profit and revenue structures, empirical studies on the X-efficiency and financial performance of Islamic banking operations are necessary.

There are currently few parametric and non-parametric studies that have addressed the performance of Islamic banking. Hassan and Hossein (2003) investigate the relative efficiency of the

banking industry in Sudan employing a panel of 17 banks for the years from 1992 to 2000. They utilize cost and profit efficiency methods and DEA techniques to examine five efficiency measures: cost, allocative, technical, pure technical and scale efficiency scores. They suggest that Sudanese banks should improve their X-efficiency by best managing and allocating their inputs. They also argue that the bank management must be appointed based on competence and expertise and not on political or personal biases. Moreover, the labor force in the banking sector must be, in their opinion, well trained to deal with the nature of Islamic banking practices.

Most recently, Hassan, (2006) investigates the relative efficiency of 43 Islamic banks in 21 countries by analyzing a panel of banks during the period of 1995-2001. Five DEA efficiency measures namely: cost, allocative, technical, pure technical and scale efficiency scores are calculated and further correlated with conventional accounting measures of performance. The results indicate that, on average, the Islamic banking industry is relatively less efficient compared to conventional counterparts in other parts of the world. The main source of inefficiency is allocative rather than technical in nature. Although Islamic banks are relatively less efficient in containing cost, findings show that they are relatively efficient in generating profit. The results also show that these efficiency measures are highly correlated with ROA and ROE, suggesting that the efficiency measures can be used concurrently with conventional accounting ratios in determining Islamic banks performance.

One additional comparison is worth considering, the comparison of Islamic banks efficiency with conventional banks. For example, Bader, Mohamad, Ariff, and Hassan, (2008) measure and compare the cost, revenue and profit efficiency of 43 Islamic and 37 conventional banks, using DEA, in 21 member countries of the Organization of the Islamic Conference (OIC) countries over 1990-2005. They assess the average efficiency of those banks based on their size, age, and region using static and dynamic panels. The findings suggest that there are no significant differences between the overall efficiency results of conventional versus Islamic banks.

Some researchers prefer to focus on financial ratios to examine the financial performance of Islamic banks. For instance, Arief (1989) examines the financial performance of Bank Islam Malaysia Berhad (BIMB). He finds that during the first six years of its establishment, BIMB exhibited impressive progress. Sarker (1999) analyzes the efficiency of Islamic banks in Bangladesh. Results reveal that the Islamic banks could not operate at full efficiency level if operated under a

conventional framework. He argues that Islamic products had different risk characteristic, so that different prudential regulation should be established.

From a comparative perspective, Samad (1999) utilizes the weighted ratio approach in order to evaluate the relative efficiency position of Bank Islam Malaysia Berhad (BIMB) and conventional banks in Malaysia during 1992-1996. The result indicates that BIMB had relatively higher managerial efficiency than conventional banks. In a further study, Samad and Hassan (1999) examine the financial performance of BIMB over the period 1984-1997 and compare that with the performance of conventional banks. They employ inter-temporal and inter-bank approach. Findings show that the financial performance of BIMB was different from conventional banks with respect to liquidity and risk management.

Rosly and Bakar (2003) examine the financial performance of an Islamic banking in Malaysia relative to the performance of the main stream banks. Results suggest that mainstream banks are more efficient than Islamic banks. Findings also show that the profitability, measured by return on assets (ROA), was statistically higher for Malaysian Islamic banks than for mainstream banks. Samad (2004) examines comparative financial performance of Islamic banks and the conventional banks during 1991-2001. The results indicate that there was no significant difference between Islamic banks and conventional banks with respect to profitability and liquidity.

Review of literature, as discussed above, shows that the empirical research on X-efficiency of Islamic banks is still in its infancy in Muslim countries while it is, to our best of knowledge, non-existent in Europe. This is due to the lack of sufficient data and the brief presence of Islamic banks in that region. Thus, the main purpose of this chapter is to bridge this gap in the literature.

6.4. Methodology

Sections 6.4.1 and 6.4.2 discuss the measurement of X-efficiency and cost-efficiency as well as our proposed approach to measure financial performance of the EIIB based on financial ratios.

6.4.1. Cost X-efficiency of Islamic banks: DEA-approach

6.4.1.1. *Data description and variables*

We measure the relative X-efficiency of Islamic banks as compared with conventional banks.

The X-efficiency concept is suited to our sample due to its small size. The sample banks are selected from two European countries: the UK and Switzerland. The study covers the period 2008-2009 and consists of observations obtained from 4 Islamic banks (Table 6.1) along with 4 carefully selected investment and private conventional banks namely: Rothschild bank, Arbuthnot Latham, Standard Chartered in the UK, and Hyposwiss Private Bank in Swiss. Due to the recent development of Islamic investment, wholesale, and private banking in Europe, our analysis is limited to the selected banks and the very short time period.[1]

Table 6.1

Brief description of the tested banks

The bank	Brief description of each bank
European Islamic Investment Bank "EIIB"	The first independent Shari'ah compliant Islamic investment bank that offers Shari'ah-compliant investment banking products and services. The bank was established in London in January 2005 and received authorization to operate from the FSA in March 2006.
Bank of London and Middle East "BLME"	The bank was first incorporated in London on 7th August 2006. It was formerly known as House of London and The Middle East. BLME is an independent wholesale investment Shari'ah compliant UK bank based in the City of London. The bank received authorization by the "FSA" in July 2007 as the largest Islamic bank in Europe.
Gatehouse Bank	The bank was established in the UK in May 2007 and received authorization from (FSA) in April 2008. Gatehouse Bank is a wholesale investment bank based in London, combining international financial market expertise with excellence in Shari'ah principle.
Faisal Private Bank "FPB"	In 1982, Faisal Finance was born in Geneva. Faisal Finance became a bank in October 2006. FPB is considered the first Swiss private bank exclusively dedicated to innovative wealth, institutional investment, and asset management in accordance with the principles of Islamic finance.

We obtained the data from the un-consolidated financial statements of each bank under consideration. The sample data have been adjusted for currency differences by converting into UK £-currency using the end of year market rate obtained from central banks of the respective countries. All variables have also been deflated by consumer price index (CPI) of each country in order to account for macro-economic differences across countries during our sample time period.

There are two main efficiency concepts that are widely used in the literature when analyzing the performance of production units: cost-efficiency and profit-efficiency. The first concept is defined as a measure of how far a bank's cost is from the cost of the best practice bank if they were to produce the same output under the same environmental conditions. On the other hand,

[1] The European Finance House is excluded from our analysis due to the unavailability of data. The bank has been provided the license to operate in the UK by (FSA) at the beginning of 2008. It signals QIB's entry into the European market, in general, and into the French and German markets, in particular. The bank manages a wide range of investments in key sectors such as real estate and appropriation of assets.

profit-efficiency is based on the economic goal of profit maximization. It requires the same amount of managerial attention to raise managerial revenues as to reduce managerial costs. It further evaluates the profit efficiency measures in terms of how close a bank is to generating maximum profits given its output levels rather than output prices.

Cost efficiency (CE) consists of two elements: the Technical Efficiency (TE) and the Allocative Efficiency (AE). TE refers to the ability of a bank to produce relatively larger output as the given input use would permit. It is also defined as the maximum possible reduction in the input use that would allow continual production of the same output as before. TE focuses on optimal use of given resources. It has therefore, an output maximization orientation. TE takes a value between 0-1. A firm having a score equal to one is technically efficient, but one with a lower score is inefficient (Hasan, 2005). The second element, Allocative (price) Efficiency (AE), measures the proportional decline in cost if the bank chooses the right mix of inputs with the price consideration (the least expensive combination of the given inputs to produce technically efficient output). AE measures the ability of a Decision-Making Unit (DMU) to avoid waste by producing a level of output at the minimal possible cost (Nunamaker, 1985). However, price takes on an important role in determining bank efficiency as it relates to economic of scale. Given quantity and price availability, overall cost efficiency can be computed. This is also referred to as X-efficiency.

6.4.1.2. DEA approach for measuring bank's X-efficiency

There are various approaches in evaluating efficiency in financial institutions in literature. But there is no consensus on the preferred method for determining the best practice frontier. Specifically, the cost efficiency of a bank can be obtained by employing either a nonparametric or parametric approach. Nonparametric cost efficiency is calculated by employing linear mathematical programming techniques. Whereas, parametric cost efficiency is derived from a cost function in which variable costs depend on the input prices, quantities of variable outputs, random error, and inefficiency (Isik and Hassan, 2002).

The most commonly used technique to measure banks cost efficiency is the non-parametric DEA approach. DEA evaluates the performance of each bank by relating its input and output combinations to a common efficient frontier. DEA has the advantage of being able to handle multiple inputs and outputs stated in different measurement units. It additionally focuses on the

best-practice frontier rather than population central tendencies and also does not require precise specification of the form of the underlying production function relationship (Charnes, Cooper, Lewin and Seiford, 1995). Due to its advantages, DEA has been utilized extensively in the empirical banking efficiency studies. In this paper, the distribution of technical, allocative and cost efficiency across banks is examined using DEA approach. This is mainly because DEA is particularly suited for small samples (Evanoff and Israilevich, 1991).

A number of different approaches can be used for modeling the banks' processes. The most distinct concepts commonly used in efficiency measurement of financial institutions are the intermediation approach and the production approach. Intermediation approach considers banks as financial intermediaries that collect funds (deposits and purchased funds) using labor and capital to transform these funds into loans and securities (investments). Under the production approach, banks produce loans and deposits accounts using labor and capital as inputs (Iqbal and Molyneux, 2005). By and large, both approaches have their disadvantages. They, for example, fail to incorporate the management of risk, information processing, and the solution of agency problems arising due to the differences between loans and deposits and the separation between management and ownership (Bikker and Bos, 2008). However, Berger and Humphrey (1997) in their international study on banking efficiency conclude that the intermediation approach is more relevant to measure bank's efficiency. Yudistira (2004) uses the DEA intermediation approach, arguing that the basic principle of the Islamic financial system (the joint-stock institutions) is the participation in enterprise, employing the funds based on the profit and loss sharing (PLS). This, inevitably implies the importance of Islamic bank's intermediary activities. Therefore, our selection of input-output variables (Table 6.2 and 6.3) in this chapter is based on the intermediation approach.

Table 6.2

A brief definition of the input / output factors

Input / Output Matrix	The factor	Definition
Inputs		
I_1	Labor	Total expenditure on employees (personnel expenses)
I_2	Fixed assets	The sum of physical capital and premises
I_3	Total funds	Total deposits and total borrowed funds
Outputs		
O_1	Total loans*	Total of short-term and long-term loans
O_2	Other earning assets	The sum of securities and investments

**The loans for Islamic banks represent the short-term cost-plus "Murabaha" financings.*

Table 6.3

A brief definition of the input prices and output prices*

Input / Output Matrix	The factor	Definition
Input prices		
$P.I_1$	Price of labor	The ratio of personnel expenses to total funds
$P.I_2$	Price of fixed assets (FA)	The ratio of other non-interest expenses to "FA"
$P.I_3$	Price of funds	The ratio of total costs to total funds
Output prices		
$P.O_1$	Price of loans	The ratio of Interest income to total loans
$P.O_2$	Price of other earning assets	The ratio of other operating income to other earning assets

** The definitions of inputs, outputs and their prices are standard in the literature.*

6.4.1.3. Mathematical formulation

Given a certain level of technology, if a given bank has specific price information and is willing to consider cost minimization function or profit maximization function, then it is possible to measure the main components of X-efficiency (i.e. the technical efficiency and the allocative efficiency) utilizing DEA technique. In DEA, the constant return to scale (CRS) assumption is only valid when all (DMUs) are operating at an optimal scale. Factors like imperfect competition and constraints in finance may cause our sample banks not to operate at their optimal scale of operations (Coelli, 1996). Therefore, we adopt the variable returns to scale (VRS) DEA model in this paper, as the European Islamic banking markets are not fully developed, and thus perfect competition is unlikely. As suggested by Banker et al. (1984), the common CRS linear programming problem can be modified to account for a VRS situation by adding the convexity constraint ($N1' \lambda = 1$) to provide:

$$
\begin{aligned}
&min_{\theta,\lambda}\ \theta, \\
&\text{st.} \quad -y_i + Y\lambda \geq 0, \\
&\qquad \theta x_i - X\lambda \geq 0, \\
&\qquad N1'\lambda = 1, \\
&\qquad \lambda \geq 0,
\end{aligned}
\tag{1}
$$

Where "θ" represents the efficiency score for each DMU. "λ" is a ($N \times 1$) vector of constants. "Y" represents all input and output data for "N" firms. "x_i" refers to the individual inputs. "y_i" defines

the outputs for the "i_{th}" firm. $N1'\lambda=1$ "ensures that an inefficient firm is only benchmarked against firms of similar size".

For VRS cost minimization, the subject of our attention in this paper, the technical efficiency (TE) score of '*n*' DMUs is obtained by running the DEA model shown in (Eq.2). Following Coelli, (1996), we estimate the cost efficiency by solving the following cost minimization DEA:

$$\min_{\lambda,} x_i^* W_i' X_i^* ,$$

$$\begin{aligned} \text{st.} \quad & -y_i + Y\lambda \geq 0, \\ & x_i^* - X\lambda \geq 0, \\ & N1'\lambda = 1, \\ & \lambda \geq 0, \end{aligned} \qquad (2)$$

Where "w_i" refers to a vector of input prices for the "i_{th}" DMU and "x_i^*" denotes the cost-minimizing vector of input quantities for the "i_{th}" DMU, given the input prices and the output levels "y_i". The total cost (economic) efficiency (CE) for the "i_{th}" DMU would be calculated as: $CE = W_i' X_i^* / W_i' X_i$, where the "CE" is the ratio of minimum cost to the observed cost, then the allocative efficiency (AE) can be residually calculated as: AE = CE / TE (Coelli, 1996). This procedure, however, includes any slacks (the inappropriate input mix) into the allocative efficiency measure. The revenue maximization and the allocative inefficiency in output mix selection can be considered in a similar manner (Ferrier and Lovell, 1990).

6.4.2. The financial performance of EIIB: Accounting ratios-based approach

The assessment of efficiency and financial performance of investment banks is important because it directs the bank managers to improve deposits and/or loan services. It also helps investment banks to minimize costs and/or maximize profits. Based on that, we assess the financial performance of the first Islamic investment bank in the UK, the EIIB, due to the increasing role and importance of Islamic investment banks on the European economy. However, few years have passed since the unique presence of EIIB in the UK and thus, very little data was available from which to assess the bank's financial performance. Our analysis, therefore, is limited to the period from 2005 to 2008.

We examine the relationship between the bank's efficiency scores and its financial performance. We further aim to test the following three assumptions: ***i***) the first Islamic investment bank in Europe is effectively in position to make its profitability, efficiency, and solvency high and less volatile. ***ii***) The liquidity ratios of Islamic banks in Europe are expected to be higher in earlier years of operation than later years due to the learning curve. ***iii***) As Islamic banking makes its inroad in the Europe, the volume of the Islamic financial mode of lending (Murabaha) is expected to grow larger in later years of its operation.

We extract the data from the bank's financial statements and also from the LSE data base. Bank's performance can be evaluated based on several financial ratios. We use 14 ratios for bank's performance (Table 6.6- appendix). These ratios are grouped under 5 broad categories: 1) efficiency, 2) profitability, 3) liquidity, 4) risk and solvency, and 5) commitment to the economy and Muslim community (Samad and Hassan, 1999).

We employ the inter-temporal analysis in order to examine the differences in a bank's performance before and after the global financial crisis of 2007. The crisis started in 2007 (reached the peak in August 2007), producing a slowdown in Islamic capital market issuance in the second half of the year. We consider the year 2007 as the "event" year and use the time window of two years before the crisis (2005 - 2006) and also two after the emergence of the crisis (2007-2008). We use the equality of means test (independent samples) at a 5% level of significance.

6.5. Empirical results

We first describe the results from examining X-efficiency of Islamic investment, wholesale, and private banks in the UK and Switzerland, followed directly by the findings from the analysis of the EIIB financial performance.

6.5.1. Bank's efficiency based on DEA- approach

Table 6.4 presents the efficiency scores of the selected Islamic and conventional banks in the UK and Switzerland. Findings show that the average cost-efficiency (CE) performance of conventional banks (CE score =69.7%) outperforms that of the Islamic banks (CE score = 49.3%). The bank's CE is supplied mainly by technical efficiency (TE) rather than allocative efficiency (AE)

Table 6.4

Bank's CRSte, VRSte, SE, TE, CE, and AE: 2005-2008

Country	Year	Type	Name of the bank	CRSte	VRSte	Scale	RTS	TE	CE	AE
UK	2008	I_S-I_n	EIIB	1.000	1.000	1.000	–	1.000	1.000	1.000
UK	2008	I_S -W- I_n	BLME	1.000	1.000	1.000	–	1.000	0.695	0.695
UK	2008	I_S -W- I_n	GhB	0.542	1.000	0.542	irs	1.000	0.178	0.178
			MEAN	0.847	1.000	0.847		1.000	**0.624**	0.624
SWISS	2008	I_S -P_r	FPB	1.000	1.000	1.000	–	1.000	**0.326**	0.326
			Mean (cross country. Is 08)	0.886	1.000	0.886		1.000	**0.550**	0.550
UK	2008	C_O- I_n	Rothschild	1.000	1.000	1.000	–	1.000	1.000	1.000
UK	2008	C_O- I_n	Arbuthnot	0.306	0.309	0.990	drs	0.337	0.067	0.198
UK	2008	C_O- I_n	St. Charter	0.700	1.000	0.700	drs	1.000	0.998	0.998
			MEAN	0.669	0.770	0.897		0.779	0.688	0.732
SWISS	2008	C_O-Pr	Hyposwiss Private B.	0.944	0.965	0.978	drs	0.963	0.555	0.576
			Mean (cross country. Co 08)	0.738	0.819	0.917		0.825	0.655	0.693
UK	2009	I_S - I_n	EIIB	1.000	1.000	1.000	–	1.000	0.889	0.889
UK	2009	I_S -W- I_n	BLME	0.878	1.000	0.878	irs	1.000	0.576	0.576
UK	2009	I_S -W- I_n	GhB	0.268	0.314	0.854	irs	0.856	0.048	0.056
			MEAN	0.715	0.771	0.911		0.952	**0.504**	0.507
SWISS	2009	I_S -Pr	FPB	0.997	1.000	0.997	drs	1.000	**0.228**	**0.228**
			Mean (cross country. Is 09)	0.786	0.829	0.932		0.964	**0.435**	**0.437**
UK	2009	C_O- I_n	Rothschild	0.788	0.999	0.789	drs	0.999	0.860	0.861
UK	2009	C_O- I_n	Arbuthnot	0.429	0.433	0.992	irs	0.447	0.094	0.211
UK	2009	C_O- I_n	St. Charter	0.735	1.000	0.735	drs	1.000	1.000	1.000
			MEAN	0.651	0.811	0.839		0.815	0.651	0.691
SWISS	2009	C_O-P_r	Hyposwiss Private B.	1.000	1.000	1.000	–	1.000	1.000	1.000
			MEAN (cross country. Co 09)	0.738	0.858	0.879		0.862	0.739	0.768
			MEAN ($I_{s.\ 08\text{-}09}$)	0.836	0.910	0.909		**0.980**	**0.493**	0.494
			MEAN ($C_{o.\ 08\text{-}09}$)	0.740	**0.838**	**0.898**		**0.843**	**0.697**	0.731

crste *= technical efficiency from DEA* $_{CRS}$, ***vrste*** *= technical efficiency from DEA* $_{VRS}$, ***scale*** *= scale efficiency = crste/vrste,* ***te*** *= technical efficiency,* ***ce*** *= cost efficiency,* ***ae*** *= allocative efficiency = ce/te,* $\boldsymbol{I_S}$*=Islamic bank,* $\boldsymbol{C_O}$*= Conventional bank,* $\boldsymbol{I_n}$*.=Investment,* $\boldsymbol{W\text{-}I_n}$ *= Wholesale Investment bank, and* ***Pr****. =Private.*

($TE_{08\text{-}09}$>$AE_{08\text{-}09}$). The visible CE advantage for conventional banks over Islamic banks may continue over time with the gap rising from 10.5% in 2008 (calculated as 65.5% - 55%) to 30.4% in 2009. These results suggest that the conventional banks have, on average, a slightly superior performance in controlling (minimizing) costs (more cost-efficient) over Islamic banks during the years 2008 and 2009. This could be explained by the fact that the size of conventional banks and their involvement in wholesale banking put them in the better position to offer competitive pricing of their banking products and services compared with Islamic banks.

The Islamic banks' cost inefficiency may be due to: ***i***) under- utilization of inputs, ***ii***) the greater costs incurred in order to have greater promotional and marketing activities and higher invest-

ment in technology, and finally ***iii***) the novelty and small size. Islamic banks operated at smaller scale compared to their counterparts-conventional and thus, cost inefficiencies exist because they were not able to benefit from economies of scale (ES) over the sample period.

In terms of allocative efficiency (AE), conventional banks surpass Islamic banks with the AE score of 73.1% compared with AE score of 49.4% for Islamic banks. Islamic banks suffer an increasing trend in their allocative inefficiency (from 55% in 2008 to 43.7% in 2009). This may be caused by regulations not controlled by management due to fluctuations and instability in factor prices. However, Islamic banks with a low AE could increase their output by changing the mix of their inputs usage.

Despite the small size of Islamic banks in Europe, it is obvious that they are technically more efficient than conventional banks.[2] Therefore, they are more able to operate closer to their efficient frontier compared to conventional banks ($TE_{IS\text{-}M08\text{-}09}$=0.980 > $TE_{CO\text{-}M08\text{-}09}$=0.843) (Fig. 6.1). The value of 0.980 means that the banks are 98% efficient and can produce the same level of output by using 2% lower inputs. This suggests that managers of Islamic banks are relatively efficient at choosing the appropriate input mix at given prices, but they are less efficient at utilizing all factor inputs. Results also demonstrate that there are unrealized benefits that could be achieved through an increase in size for small Islamic banks or through consolidation. Overall, results show that the banks, either Islamic or conventional banks, have higher TE scores than AE and/or CE. This illustrates that the bank's inefficiency is caused primarily by the choices of inpu-

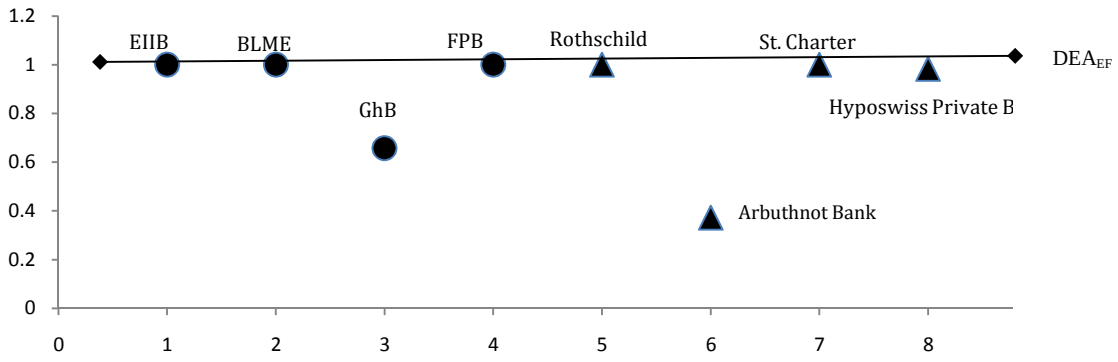


Fig. 6.1: Average pure technical efficiency scores (DEA_{VRS}) by individual bank, 2008-2009

[2] Technical efficiency is decomposed into pure technical efficiency (DEA_{PTE} or vrste) which captures the management practices, and scale efficiency (DEAscale), which shows whether or not the bank operates under optimal size.. Banks that are not considered scale efficient will experience either increasing return-to-scale (IRS), which indicates they were operating at scale that is too small or decreasing return-to-scale (DRS), which indicates they were operating at scale that is overly large.

ts price mix (Fig. 6.2). By and large, a trend comparison of bank's efficiency shows that the conventional banks have an increasing (upward) trend in CE, AE, and TE over sample years. On contrast, Islamic banks suffered a downward trend in the overall economic efficiency-CE ($CE_{08=}0.550 < CE_{09=}0.435$) due to the low scores of AE ($AE_{08=}0.550$ and $AE_{09=}0.437$).

Results further indicate that the poor and inefficient management practices (PTE or VRS) are the main drivers of conventional bank's technical inefficiency. This is because the banks scale efficiency scores are higher than its pure technical efficiency (VRSte=0.838 < scale=0.898). Conventional banks have mostly a decreasing return-to-scale (DRS). This indicates that they are operating at too large a scale and should shrink the output endowments. In contrast, findings show

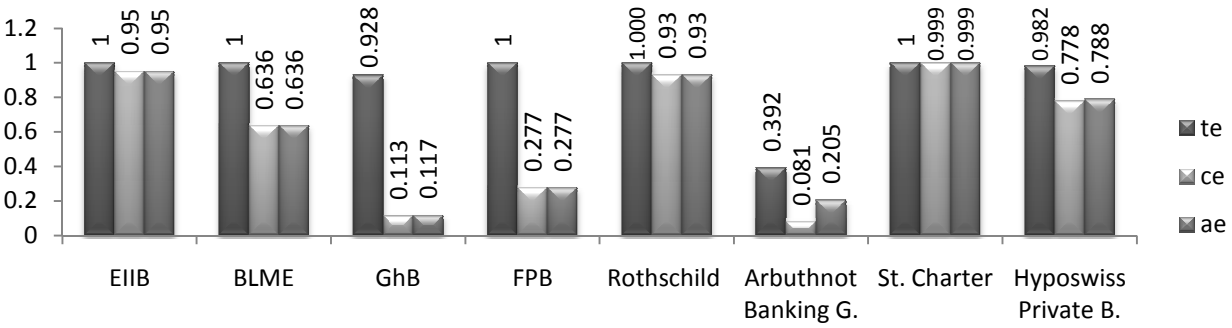


Fig. 6.2: Average X-efficiency Scores (TE, CE, and AE) by Individual Bank, 2008-2009

that the SE for Islamic banks in Europe is relatively high over 2008 and 2009, yet still less than the banks PTE (VRSte =0.910 > scale=0.909). Consequently, technical inefficiency appears to be mostly scale in nature rather than technical. That is to say, the bank's non-optimal size of operations had a stronger influence on bank's technical inefficiency than inefficient management practices. However, a possible reason for lower efficiency of Islamic banks is that several new Islamic banks joined the European market during or close to our sample period. These banks are small in size, passing through an expansion phase, and may have employed higher amounts of fixed assets, which will possibly generate returns in future.

Islamic banks in the UK (except Gatehouse Bank) have a constant return to-scale (CRS), particularly in 2008 and thus, operate relatively at their "correct" scale. In 2009, those banks have an increasing return-to-scale (IRS) illustrating that they could improve efficiency by scaling up activities. Therefore, the banks are scale inefficient with respect to their potential to achieve bigger

outputs in Europe. Overall, results indicate that the vast majority of the Islamic banks are operating at either CRS or IRS. This suggests that the managers of Islamic banks are relatively good at taking advantage of decreased cost from IRS operations. In the Swiss banking industry, however, the stand–alone Islamic bank, namely FPB, has a DRS suggesting that the inefficiency of Swiss Islamic banks is largely caused by too big outputs, and thus, could improve efficiency by scaling down banking operations and activities.

Eventually, our findings reveal no striking differences across countries (Switzerland and the UK) in terms of mean efficiency. Tiny variations are mainly due to country specific factors that could be related for example to differences in the competitive structure of markets.[3] Simple comparison between the two countries suggests that the Swiss banks with (CE) efficiency scores of 32.6% in 2008 and 22.8% in 2009 are, on average, less cost efficient than the UK banks with scores of 62.4% and 50.4% in 2008 and 2009, respectively. By and large, it seems that the Islamic banks have taken the opportunity to exploit the European banking integration through competition. Islamic banking product holding Shari'ah principles is considered as a new innovative product in the European market, whereas the conventional banking system relies on the traditional products. This could be a good prospect for Islamic banks in Europe to take advantage of innovation in spurring its efficiency through competition.

6.5.2. The EIIB Financial Performance: Accounting Ratio-Based Approach

The findings from the financial ratio analysis (FRA) show different but interesting results as shown in Table 6.7- the appendix. In terms of bank's profitability performance, the Profit to Total Expenses ratio (PER), Return on Asset ratio (ROA) and Return on Equity ratio (ROE[4]) (Fig. 6.3) exhibit a significant downward trend, reflecting a poor financial performance over the period 2005-2008. The bank's negative net income [5] (Fig. 6.10), the decline in asset value results from the effects of the financial crisis that emerged in 2007, [6] and the lack of expertise, products

[3] Regardless of the small sample size and the arbitrary selection of the conventional banks based on the banks profit average values, it is clear that Islamic banks in the UK perform relatively better than Islamic banks in Switzerland. This might be attributable to the different banking structures in each country and the fact that Islamic banks in the UK are more mature than their peers in Switzerland. Thus, the legal framework for banking activities in Switzerland might not suit the unique Islamic banking principle which leads to underperformance of Islamic banks.

[4] Table 6.5 in the appendix reports a detailed description of the abbreviations used in the "FRA".

[5] Despite the negative effects of the global crisis in 2008, the EIIB operating income increased from £ 13m to £ 13.2m (2%). Meanwhile, the banks expenses declined by 18% from £ 10.4m to £ 8.5m.

[6] The severe decline in the commercial real estate market and the IPD property index during the year 2008 negatively affect the performance of EIIB. The bank increased provisions on the property portfolio by £14.7m, resulting in a loss for the year of £14.8m after tax.

and services were the main drivers behind the inadequate profitability performance. This is despite the fact that the bank had relatively limited exposure to the subprime events because it did not engage in the purchase or trade of mortgage-related financial products, which provoked the downfall of some of the world's largest investment banks. There are also various reasons for the lower profitability performance of the EIIB. *First*, in order to provide the guarantee of depositor's deposits and trust, EIIB maintains a high level of liquidity. In 2008, the bank has net liquid asset equal to 48% of customer deposits which is materially higher than the regulatory minimum of -5%. *Second*, it could be due to increased competition in the Islamic investment banking in UK starting from 2007. It should be noted, however, that the EIIB's poor profitability performance is statistically insignificant as the means of (PER, *P*-value=0.108), (ROA, *P*- value=0.269) and (ROE, *P*-Value =0.288) are different between the two periods, just before and after the crisis (*P*-value>0.05).

In terms of bank's efficiency performance, the efficiency ratios: Asset Utilization ratio (AU) and Operating Efficiency ratio (OE) show an increasing (upward) trend over time (Fig. 6.4). This implies that the bank is effective in utilizing and using its high productive asset leading to improved productivity. This also suggests that the bank is more efficient in managing (minimizing) its operating expenses and generating more operating revenues. Findings, however, suggest a statistically insignificant difference in the bank's efficiency performance between the period before

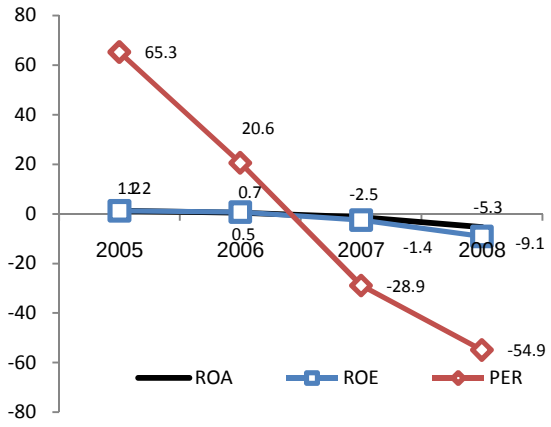


Fig. 6.3: Profitability measures % (2005-2008)

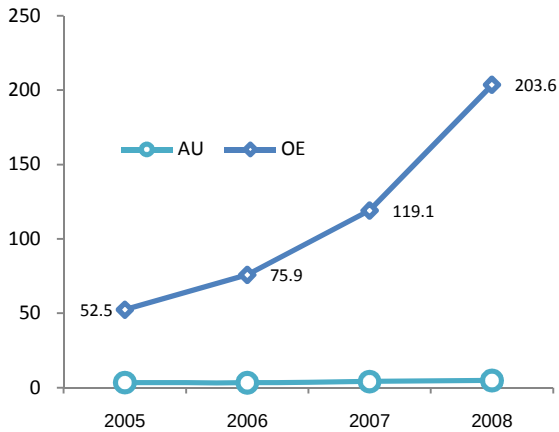


Fig. 6.4: Efficiency measures % (2005-2008)

and after the crisis. By and large, the fundamental characteristic of the bank based on the previous results is the paradox its high operational efficiency performance and its low (poor) profitability performance. This occurs despite the more general trend that the higher efficiency is asso-

ciated with higher profitability. However, plainly, judging the performance of the bank on the basis of profitability alone would overlook the bank with high efficiencies. In fact, "*100% efficient bank can be found across a wide range of profits, which indicates that high profitability is not exclusively related to high efficiency*" (Camanh and Dyson, 1999).

To evaluate the bank's liquidity risk and its ability to pay obligations, three measures of liquidity are employed: the Current Ratio (CA), Current Asset Ratio (CAR) and Loan to Asset Ratio (LAR). These ratios reflect the structure of assets as a measure of liquidity. Results reveal that both (CA) and (CAR) ratios decrease (have a downward trend) over time. Meanwhile, the bank's LAR ratio increases during the period 2005-2006 but decreases afterwards. This is mainly due to the fact that the Islamic investment bank is a new bank in the UK which led to an increase in the bank's assets (size) as it expanded its investment in facilities. The high value of LAR during the first time window (years before the crisis) could be an indication of potentially higher profitability and risk. It further illustrates that the bank is loaned up and has a low liquidity (yet quite enough to revive bank lending). On the other hand, in the post crisis period, the decline in the ratio demonstrates that the bank faces a lower risk of default. These results also suggest that the bank has started a reasonable focus on short term rather than long-term investments (Fig. 6.5). The liquidity measures, however, do not actually show any statistically significant difference between the period before and after the crisis (Table 6.6). The means of the two periods for CA, CAR, and LAR are not statistically different. This indicates that bank's liquidity position remains relatively unchanged between 2005-2006 and 2007-2008. Such a finding rejects our assumption that EIIB will hold less liquidity in the subsequent years of operation when the bank becomes more mature.

Furthermore, our results show an increasing trend in the Loans to Total Assets (LTA) ratio to measure the bank's community commitment (Fig. 6.6). This indicates that the bank is committing for supporting long-term development projects despite the fact that Islamic banks appear commonly to be either unable or unwilling to participate in long-term projects. In terms of the intertemporal analysis, the (*t*) test reveals a statically reliable difference between the period before and after the crisis (LTA, P-value=0.005).

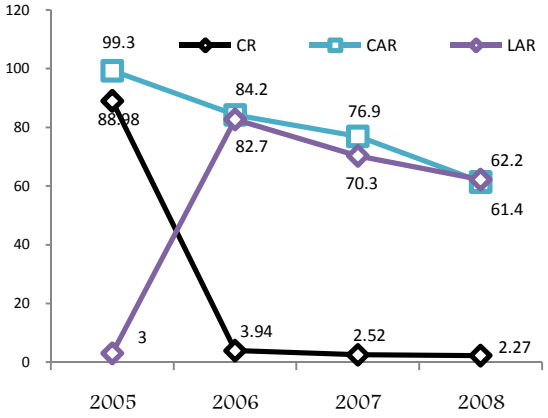


Fig. 6.5: Liquidity measures, % (2005-08)

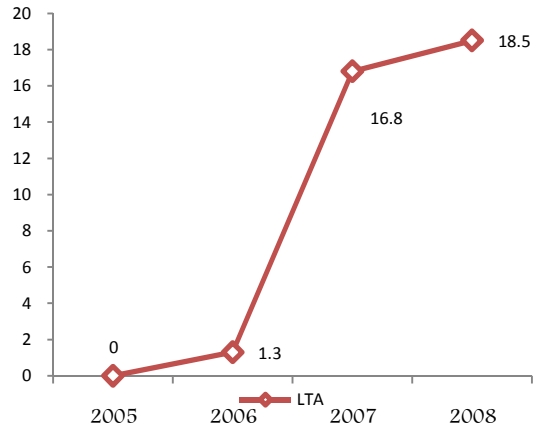


Fig. 6.6: Commitment to Muslims Economy -%

The bank's performance of risk and solvency measured by Debt Equity Ratio (DER), Debt to Total Assets Ratio (DTAR), and Equity Multiplier ratio (EM) (Fig. 6.7), shows a significant increase from 2005-2007, followed directly by a clear downward trend from 2007-2008. Nonetheless, over a period of time, the bank mitigates the risk, hence, becomes relatively less risky, more solvent, and operates with lower use of debt. This could be explained partially by the fact that investments in government securities become much larger.

Although the comparison of the bank's risk and solvency ratios in pre-crisis and post-crisis periods reveal a deterioration of risk, results suggest a non-significant statistic as: (DER, P = 0.129), (DTAR, P = 0.201), and (EM, P = 0.129). Meanwhile, Equity ratio shows a statistically insignificant deterioration (ER, P = 0.201) over the period 2005-2007. This reflects the expansion of the bank in total assets, the more speculative situation because of the effect of high leverage,[7] and the greater possibility of financial difficulty arising from excessive debt burden. However, starting from 2008, the bank shows a slight decrease in its total assets, reflecting a strong financial structure of its equity.

It is worth mentioning that the equity market as a whole has also been impacted adversely by the global financial crisis of 2007 due to a lack of liquidity, reduced fee generation and subdued investors demand. Consequently, the stock price performance of Islamic banks has generally imi-

[7] Islam is considered to be against the "excessive" leverage. Hence, leverage needs to be controlled to ensure that credit does not exceed the ability of the borrower to repay.

tated the largely downward trend of conventional banks. As a result, EIIB has not been immune from the effects of the global recession. It has been facing a decline in the share price and thus, has a poor track record (Fig. 6.9).

Some critics argue that Murabaha is not a pure Islamic product. Despite the criticism, the bank's involvement in delivering Murabaha products (loans) appears to be the most dominant[8] and has increased significantly from 2005 to 2008 as a result of the increase in the bank's capital.[9] The bank's average supply of loans under this category has increased by 3.61% in the post-crisis period. The difference in means in post versus pre-crisis periods is statistically significant (P-value=0.001) (Fig. 6.8). However, Mudaraba and/or Musharaka are not popular as Murabaha in the UK because they are less profitable, more risky, and/ or incur high monitoring costs.

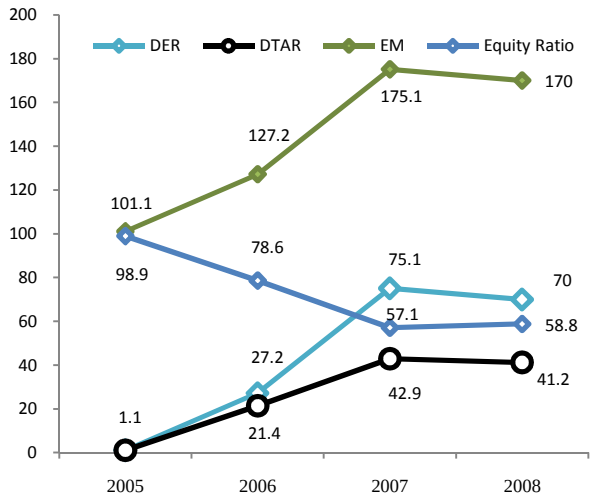


Fig. 6.7: Risk and solvency Measures-% (2005-08)

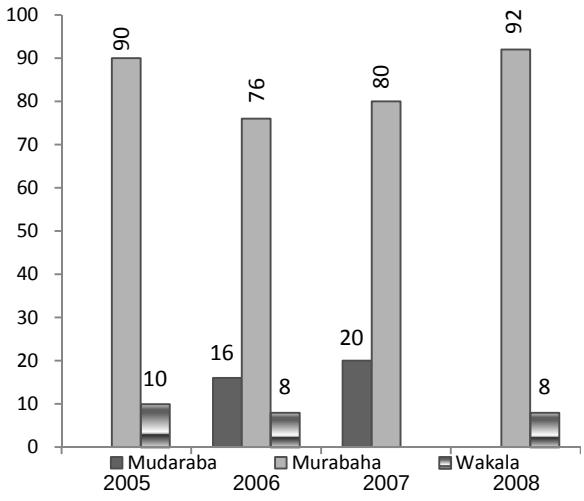


Fig. 6.8: Investment & financing portfolio -% of financing

6.6. Conclusions

Our extensive DEA-based analysis suggests that the Islamic investment, wholesale and private banks operating in Europe are technically inefficient. In spite of that, they tend to operate closer to the efficient frontier than conventional banks. The inefficient management practices are the main drivers of conventional bank's technical inefficiency. Islamic banks suffer, however, from the problems of sub-optimal scale of operations. They also experience a high allocative inefficie-

[8] In 2008, Murabaha financing is responsible for over 90% of EIIB's value of assets on the balance sheet.

[9] In 2008, the bank had a strong capital base of £163 m which is 680% of the minimum regulatory requirement.

ncy, which indicates they seem to have problems with the choices of input prices. Taking the advantage of their size, conventional banks are better at controlling costs than Islamic banks

Our findings also show that the conventional banks have mostly a decreasing return-to-scale of efficiency scores. Such a result indicates they are operating at a scale that is overly large and, hence, should shrink their output endowments. In contrast, Islamic banks are operating at either constant or increasing return-to-scale where scale efficiency is relatively less than technical efficiency. This, however, suggests that the managers of Islamic banks are relatively good at utilizing all factor inputs and taking advantage of decreased cost from increasing return to scale operations. Additionally, such a result indicates that the technical inefficiency for Islamic banks appears to be mostly due to the bank's size of operation rather than to their management practices given the novelty and small size of Islamic banks in Europe.

In terms of the financial ratio analysis, findings show that the European Islamic Investment Bank (EIIB) shows a significant downward trend in its achieved profitability reflecting a poor financial performance. This is due to the decline in asset quality, high level of liquidity, increasing competition and higher operating costs. In contrast, the bank's efficiency performance is in an upward trend over the sample years, revealing that it is more efficient in managing the operating expenses, generating more operating revenues, and using and deploying assets. Results also suggest that the bank's growth rate of liquidity gradually decreases when it becomes more mature. Due to the larger investments in government securities, the bank mitigates the business risk and becomes relatively less risky and more solvent, particularly during the financial crisis of 2007. Finally, the inter-temporal analysis of the profitability, liquidity, risk and solvency, and efficiency in pre-crisis and post-crisis periods does not show any statistically significant differences. By contrast, the ratio that measures the commitment of Islamic banks to the Muslim economy exhibits a significant difference, indicating that the bank is committing to support long-term development projects along with the short-term financing.

Appendix-Ch.6

Table 6.5

Brief description of the financial (Accounting) performance measures

The Ratio	The Description
Profitability Ratios	The profitability ratios are used to assess the capability of a bank to generate earnings as compared to its expenses and other relevant costs incurred during certain period of time.
Return on Asset (ROA)	ROA = profit after tax/total asset. It shows how a bank can convert its asset into net earnings. The higher value of this ratio indicates higher capability of the bank. This ratio provides indicator for evaluating the managerial efficiency.
Return on Equity (ROE)	ROE = profit after tax/equity capital. This ratio indicates how bank can generate profit with the money shareholders have invested. The higher value of this ratio shows higher financial performance. Like ROA, this ratio is also a good indicator of managerial efficiency.
Profit to Total Expenses (PER)	PER = profit after tax/total expense. This ratio indicates profitability of a bank with regard to its total expenses. A high value of this ratio indicates that the bank could make high profit with a given expenses.
Liquidity Ratios	The liquidity ratios measure the capability of a bank to meet its short-term obligations. The higher value of this ratio indicates that the bank has larger margin safety to cover its short-term obligations.
Current ratio (CA)	CR = current asset/current liability. This ratio indicates the capability of a bank to meet the current liability with the current asset. The high value of this ratio indicates that the bank is more liquid.
Current asset ratio (CAR)	CAR = current asset/total asset. This ratio shows composition of bank's asset. The high value of this ratio indicates that the bank has more liquid asset than long term asset.
Loan to Asset Ratio (LAR)	LAR measures the liquidity condition of the bank. LAR measures liquidity of a bank in terms of its total assets. That is, it gauges the percentage of total assets the bank has invested in loans (or financings). The higher is the ratio the less the liquidity is of the bank. However, high LAR is an indication of potentially higher profitability and hence more risk.
Risk and Solvency Ratios	Solvency ratios indicate the risk inherent in the bank as a result of its debt.
Debt equity ratio (DER)	DER = debt/equity capital. This ratio shows how a bank finances its operation with debt relative to the use of equity.
Debt to total assets ratio (DTAR)	DTAR = debt/total asset. This ratio indicates the proportion of assets financed with debt. A high value of this ratio provides indication that the bank involves in more risky business.
Equity multiplier ratio (EM)	EM = total asset/share capital. This ratio is a measure of financial leverage. It shows a bank's total assets per dollar of stockholders' equity. A higher equity multiplier indicates higher financial leverage, which indicates signal for possible risk failure.
Equity Ratio (ER)	ER is a financial ratio indicating the relative proportion of equity used to finance a bank's assets (Total Owner's Equity / Total Assets). The ratio is a good indicator of the level of leverage used by a bank. It measures the proportion of the total assets that are financed by stockholders and not creditors.
Efficiency Ratios	Ratios that are typically used to analyze how well a bank uses its assets and liabilities internally. Efficiency ratios can calculate the turnover of receivables, the repayment of liabilities, and the quantity and usage of equity.
Asset utilization ratio (AU)	AU = total operating income/total asset. This ratio measures capability of a bank to generate revenue with its asset. The high value of this ratio indicates the high productivity of bank's asset.
Operating efficiency ratio (OE)	OE = total operating expense/total operating income. This ratio indicates how efficiently a bank uses its assets, revenues and minimizing the expenses. In other words, it shows how well the bank could reduce the expenses and improves productivity.
Commitment to Economy and Muslim Com.	To evaluates the bank's community involvement.
Long term loan ratio (LTA)	LTA = long term loan/total loans. A high LTA indicates a bank commitment for supporting long term development projects.

Table 6.6

Financial performance of EIIB before and after the financial crisis of 2007: T-test-based analysis

The Ratio	Before the crisis (05-06) %		After the crisis (07-08) %		Sig.2 Tailed. *P*-value
	Mean	**S. Deviation**	**Mean**	**S. Deviation**	
Profitability Ratios					
ROA	0.85	0.495	-3.35	2.758	0.269
ROE	0.95	0.354	-5.8	4.667	0.288
PER	42.95	31.608	-41.9	18.385	0.108
Efficiency Ratios					
AU	3.35	0.071	4.45	0.495	0.190
OE	64.2	16.546	161.35	59.751	0.243
Income Expense Ratio (IER)	164.4	39.032	90.9	32.527	0.182
Risk and Solvency Ratios					
DER-times	14.15	18.455	72.55	3.606	0.129
DTAR	11.25	14.354	42.05	1.202	0.201
EM	114.15	18.455	172.55	3.606	0.129
ER	88.75	14.354	57.95	1.202	0.201
Liquidity Ratios					
CA-Times	46.46	60.132	2.395	0.177	0.489
CAR	91.75	10.677	69.15	10.960	0.172
LAR	42.85	56.356	66.25	5.728	0.662
Commitment to Economy and Muslim Community					
LTA	0.65	0.919	17.650	1.202	0.005

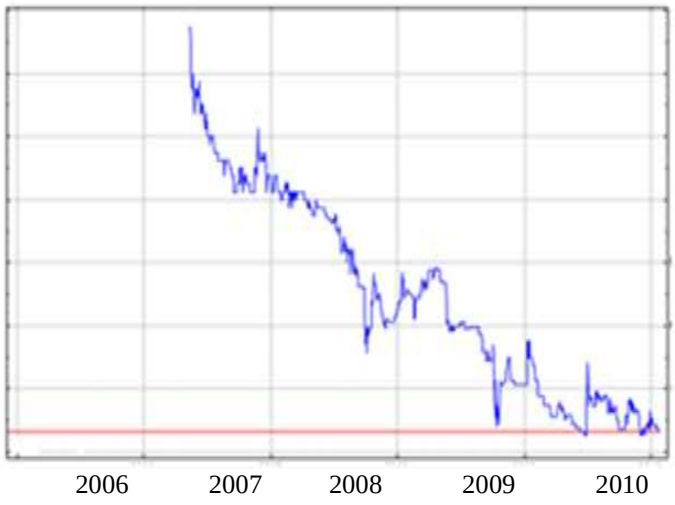


Fig. 6.9: Stock price for (EIIB)-5 years volume
Source: ADVFN plc.2010

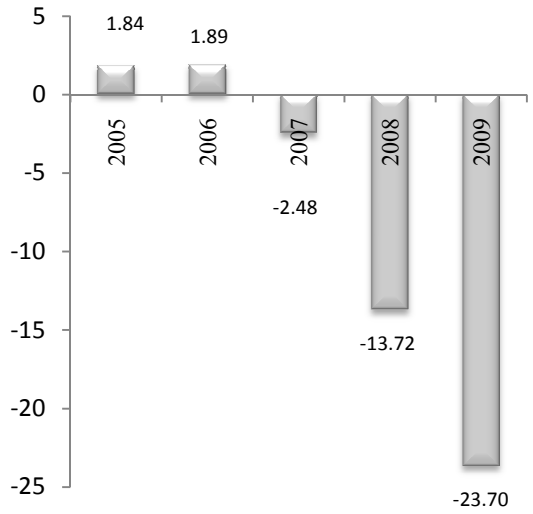


Fig. 6.10: EIIB profit before tax (£m) over 2005-09

References

Anderson, R. I., R. Fok, Zumpano, L. V. and Elder, H. W. (1998) 'Measuring the Efficiency of Residential Real Estate Brokerage Firms', Journal of Real Estate Research, Vol.16 No.2, pp.139–58

Arief, M. (1989) 'Islamic Banking in Malaysia: Framework, Performance and Lesson', Journal of Islamic Economics, Vol.2 No.2, pp. 67-78.

Bader, M. K. I., Mohamad, S., Ariff, M. and Hassan, T. (2008) 'Cost, Revenue, and Profit Efficiency of Islamic Versus Conventional Banks: International Evidence Using Data Envelopment Analysis', Islamic Research & Training Institute, Vol.15 No.2, pp. 23-76.

Banker, Rajiv D., Charnes, A. and Cooper, W. W. (1984) 'Models for Estimating Technical and Scale Efficiencies', Management Science, Vol. 30, pp. 1078-92.

Berger, A. N. and Humphrey, D. B. (1997) 'Efficiency of financial institutions: International survey and directions for future research', European Journal of Operational Research, Vol. 98 No.2, pp.175-212.

Berger, A.N., Hunter, W.C. and Timme, S.G. (1993) 'The Efficiency of Financial Institutions: A Review and Preview of Research Past, Present and Future', Journal of Banking and Finance, Vol. 17, issue 2-3, pp. 221-249.

Bikker, J., A. and Bos, J.W.B. (2008) 'Bank performance: a theoretical and empirical framework for the analysis of profitability, competition, and efficiency', Routledge, USA

Camanh, AS. and Dyson, RG. (1999) 'Efficiency, size, benchmarks and targets for bank branches: an application of data envelopment analysis', Journal of the Operational Research Society, Vol. 50 No.9, pp. 903-915

Charnes, A., Cooper, W.W, Lewin, A. Y. and Seiford, L. M. (1995) 'Data Envelopment Analysis, Theory, Methodology and Applications', Kluwer Academic Publishers, Boston.

Coelli, T.J. (1996) 'Guide to DEAP Version 2.1: A data envelopment analysis (computer program)', CEPA working paper. No.8/96, Department of Econometrics, University of New England, Armidale NSW Australia.

Evanoff, D.D. and Israilevich, P.R. (1991) 'Productive efficiency in banking', Econometric Perspectives, Vol. 15 No.4, pp.11-32

Ferrier, G. and Lovell C.A.K. (1990) 'Measuring Cost Efficiency in Banking: Econometric and Linear Programming Evidence', Journal of Econometrics, Vol. 46, Issues 1-2, pp. 229-45.

Hasan, M. and Dridi, J. (2010) 'The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study', IMF WP/10/201. Available at SSRN: http://ssrn.com/abstract=1750689

Hasan, Z. (2005) 'Evaluation of Islamic banking performance: On the current use of Econometric models', MPRA Paper No.6461. Available at: http://mpra.ub.uni-muenchen.de/7272/

Hassan, M.K. (2006) 'The X-efficiency in Islamic Banks', Islamic Economic Studies, Vol. 13 No. 2, pp. 49-77.

Hassan, M.K. and Hussein, K.A. (2003) 'Static and dynamic efficiency in the Sudanese banking system, Review of Islamic Economics, Vol. 14, pp. 5-48.

Iqbal, M. and Molyneux, P. (2005) 'Thirty years of Islamic banking: History, performance, and prospects' Palgrave Macmillan, New York.

Isik, I. and Hassan, M., K. (2002) 'Cost and Profit Efficiency of the Turkish Banking Industry: An Empirical Investigation', Financial Review. Vol. 37 No. 2, pp. 257-280

Leibenstein, H. (1966) 'Allocative efficiency vs. X-Efficiency', American Economic Review, Vol. 56 No. 3, pp. 392-415

Nunamaker, Thomas R. (1985) 'Using data envelopment analysis to measure the efficiency of non-profit organizations: A critical evaluation', Journal of Managerial and Decision Economics, Vol. 6, pp. 50–58.

Richard, D. and Villanueva, D. (1980) 'Relative Economic efficiency of Banking System in a Developing Country', Journal of Banking and Finance, Vol. 4, Issue 4, pp. 315-334

Rosly, S. A. and Bakar, M. A. A. (2003) 'Performance of Islamic and Mainstream Banks in Malaysia', International Journal of Social Economics, Vol. 30 No.12, pp. 1249-1265.

Samad, A. (1999) 'Comparative Efficiency of the Islamic Bank Malaysia vis-à-vis Conventional Banks', IIUM Journal of Economics and Management, Vol. 7 No.1, pp. 1-25.

Samad, A. (2004) 'Performance of Interest Free Islamic Banks vis-à-vis Interest-Based Conventional Banks of Bahrain', IIUM Journal of Economics and Management, Vol. 12 No.2, pp. 1-25.

Samad, A. and Hassan, M. K. (1999) 'The performance of Malaysian Islamic Bank During 1984 -1997: An Explanatory Study', International Journal of Islamic Financial Services Vol. 1 No.3

Sarker, M. A. A. (1999) 'Islamic Banking in Bangladesh: Performance, Problems and Prospects', International Journal of Islamic Financial Services, Vol.1 No.3, pp. 15-36

Tahir, I.M. and Abu Bakar, N.M (2010) 'Cost and Profit Efficiency of the Malaysian Commercial Banks: A Comparison between Domestic and Foreign Banks', International Journal of Economics and Finance, Vol.2. No.1, pp. 186-197

Yudistira, D. (2004) 'Efficiency of Islamic Banks: an Empirical Analysis of 18 Banks. Islamic Economic Studies', Vol. 12 No. 1, August.

Chapter 7

Summary Conclusions and Scope for Further Work

7.1. Brief introduction

The purpose of this dissertation is to explain the fundamental principles and characteristic of Islamic finance, and also to explore the possibilities of the implementation thereof in the Western world. The thesis firstly introduces the socio-economic rationale underpinning Islamic finance, as it will be difficult to appreciate the resultant financial techniques without an understanding and appreciation of these principles. It then compares the objectives of Islamic finance with that of conventional finance. Having firmly established the philosophy and difference in the Islamic finance approach, the different modes of financing in Islam have been explained along with examples given of their application. The focus then moves to create some understanding of the specific risk profile and challenges which are particularly associated with Islamic finance.

Islamic banking and finance has emerged as one of the most rapidly expanding sectors in the global financial system. Therefore, we attempt, in this thesis, to explore the emergence and the continual growth of Islamic banking and finance which is widely spread inside as well as outside the Islamic countries, specifically during the global financial crisis of 2007 and the consequent adverse market conditions. However, the Islamic perspective on this crisis is also presented to show how Islamic economic system might help to bring stability to the world's economy.

From an empirical point of view, the goal of this dissertation has been to investigate the efficiency and the productivity performance of the first established full-fledged Islamic commercial banks in Europe (i.e. the UK and Bosnia and Herzegovina "BiH") against counterparties conventional banks operating in each sample country, on the one hand, and also against Islamic commercial banks from Muslim-majority countries: the GCC-States (namely: Saudi Arabia, Qatar, Bahrain, Kuwait, and the United Arab Emirates), Malaysia, Azerbaijan, and

Turkey, on the other hand. Utilizing the sample period of 2005-2008, we particularly employs the non-parametric analysis approach, the Data Envelopment Analysis (DEA), to generate efficiency scores for our sample banks. The DEA-based Malmquist productivity indices are also calculated to measure the banks' relative productivity changes (progress or regress) over time. Moreover, the OLS-regression technique is used to determine the impact of the internal and external factors on bank's performance and also to check the robustness of the results obtained from the DEA scores.

Additionally, we use separate efficiency-profitability matrix analyses, based on the efficiency scores and profitability ratios, for a selected sample of banks, specifically to determine the characterization of their performance. Furthermore, in order to investigate the association of the efficiency scores with the common financial (accounting) ratios, we compute the banks' Spearman's rho correlation coefficients between the two variables.

Eventually, the thesis aims at analyzing the (cost)-X-efficiency levels and financial performance of Islamic investment, wholesale, and private banks from the UK and Switzerland relative to the interest-based banks in the same countries. To this end, we primarily utilize the DEA-approach to estimate the X-efficiency measures over the time interval 2008-2009. We then perform various well-known financial ratios to evaluate the overall performance of the first European Islamic investment bank in the UK during 2005-2008. In order to determine the differences of the banks' performance in pre versus post the global financial crisis of 2007, we employ the inter-temporal analysis using the matched pairs *T-Test*, the most commonly used method to evaluate the differences in means between two groups.

By and large, this chapter summarizes and highlights the main results and conclusions drawn from the work undertaken in this dissertation. This is followed by suggestions for possible future research directions and potential areas of exploration.

7.2. Summary and Conclusions

7.2.1. Preliminary summary of results: Market information-based analysis

In recent years, Islamic finance has grown rapidly across the world at an estimated growth rate of 15-20% per annum. It offers bright prospects for those involved and thus, rapid growth

outside its historical boundaries is expected to continue over time. The ethical principles of Islamic finance make them attractive to a wide spectrum of ethically-conscious clients who desire a socially just financial system. More Muslim-clients are choosing to invest in Islamic financial instruments and solutions available through long-established Islamic banks from Muslim countries. Muslims, as well as non-Muslims, banking customers in the West are also increasingly attracted by the ethical Islamic model. Recognizing the importance of Islamic finance, many financial players have decided to respond to the market demands. This was particularly through establishing new banks, switching from conventional to Islamic methods of banking operations, the establishment of Islamic windows, moving from Islamic windows to separate subsidiaries, and shifting from being a bank-like finance company to become a full-fledged bank. At the countries' level, European governments are trying also to out-compete each other in setting a viable framework for establishing Islamic finance.

Despite the growing interest and the immense, robust, and rapid growth of the Islamic banking and finance industry, this novel area of finance has not been completely immune to the global economic uncertainty, as it is part of the wider global financial system and consequently will be affected by all financial dealings. Most recently, Islamic financial institutions have been negatively affected, to a certain degree, by the financial crisis, which has hit the industry's sources of funding and property values in 2007. However, by and large, Islamic financial markets avoided, as compared to their conventional peers, the speculative investments and the complex financial instruments, and have no money invested in uncovered loans financial derivatives and toxic assets. Therefore, they are comparatively less vulnerable to the impacts of the financial crisis and are also amongst the first markets to recover from the negative impacts of the present global economic recession. This might be particularly due to the flush of oil wealth in the Gulf region, the small size of Islamic banks, and the newness of Islamic finance market.

Because we applied different types of empirical analysis in this thesis and came up with significantly different findings, we introduce in the next section the conclusions for our empirical chapters, relatively, as they originally appear in the proposed papers.

7.2.2. *Summary of the results of our empirical analysis:*

7.2.2.1. Proposed paper 1: Efficiency performance of IBB against Islamic banks from Muslim-majority countries and also against conventional banks from the UK

Our empirical analysis in this thesis shows that the Islamic Bank of Britain (IBB) is technically

inefficient (pure technical efficiency scores (PTE) < 1), with the average technical efficiency scores range between DEA_{PTE}=30.6% and DEA_{PTE}=90.1%. IBB is also inefficient in exploiting the economies of scale (ES) given its scale of operations. It appears that the bank's inefficiency arises from inefficient management practices (pure technical inefficiency > scale inefficiency) as compared with small Islamic banks in Muslim-majority countries and small conventional banks in the UK. Bank's relative inefficiencies, however, become rather scale (size) in nature relative to large Islamic and conventional banks. IBB might substantially enhance its efficiency by scaling up activities to a certain level, the mid-size level.

Findings also illustrate that the small Islamic banks (including IBB) and small conventional banks exhibit initially, compared to the large Islamic and conventional banks, poor efficiency scores. Despite the prevailing market conditions being adverse, the bank's efficiency performance subsequently gradually increases with the passage of time. This is mainly due to its novelty and small size. In contrast, large conventional banks, on average, have an upward trend of estimated efficiency, generally with declining increments. Meanwhile, the large Islamic bank's inefficiency increased (the rate of efficiency improvement decreases) over time, partly due to the complex credit risk monitoring arrangements. These results, however, indicate that the larger the bank, in term of total assets, the more affected by the financial instability which suggests that "the bigger is not always the better". The results also propose that the IBB has a substantial room for improvements to sustain its competitive edge, taking into consideration that it is, to a certain extent, better in utilizing resources (cutting costs) than generating revenues.

In terms of the correlation coefficient between the bank's DEA-efficiency scores and it's financial performance, findings illustrate that the efficiency measures calculated using DEA method are robust, highly correlated with the results obtained by ROA and ROE, and thus can be used separately and/or concurrently with the standard accounting measures in determining Islamic banks performance within and outside the UK. However, there is an absence of such argument in the UK non-Islamic banking sector at which the information contained in the conventional financial measures are not closely corresponded to that contained in efficiency measures.

Moreover, findings show that the IBB falls in the question marks quadrant in the 4-quadrant efficiency-profitability matrix. This indicates that the bank exhibits low profitability and efficiency performance and thus, is considered to be under-performing. IBB is probably under-resourced and lacks appropriate skills and therefore, with a favorable environment and additional

resources, it might improve its efficiency and profitability. By increasing efficiency, the bank can possibly move to the “star” quadrant.

In terms of the DEA-second stage analysis, results suggest that the technically more efficient banks are those that have greater profitability and loans intensity, on average acquire less debt, and have a lower market share. IBB, however, is relatively superior in terms of lending intensity and capital adequacy relative to both Islamic and conventional banks.

7.2.2.2. Proposed paper 2: Efficiency and productivity performance of IBB and BBI relative to Islamic banks from Muslim countries and conventional banks from the UK and Bosnia

Findings suggest that the Bosna Bank International (BBI) and the Islamic Bank of Britain (IBB) are relatively technically more inefficient compared to Islamic banks from Muslim countries, and conventional banks operating in the UK and Bosnia (BiH) banking industries. Bank’s inefficiency, by and large, stems from inefficient management practices. Non-optimal size of bank’s operations contributes also, to some extent, in the bank’s overall inefficiency. Findings indicate that the BBI is comparatively more capable to operate closer to efficient frontier than IBB, but IBB, by contrast, provides more growth potential by recording a respectable positive trend in estimated efficiency performance.

Pertaining to the analysis of the Malmquist Productivity Indices (MPI) of the Islamic banking sector, results indicate that the BBI managed to achieve high positive growth in total factor productivity (TFPch), largely due to the high average growth in technical efficiency (TEch). The bank yields also high-growth rates of technological (innovation) efficiency (TECch). This trend, however, subsequently reverses, apparently due to the global crisis of 2007. By contrast, IBB, as well as the average Islamic banking sector within and outside Europe, suffered not only a relative declining but also a negative growth rate in total factor productivity, driven mostly by the significant regress on banks' innovation. Overall, it seems that the Islamic bank’s total productivity growth is contributed to a large extent by the pure technical efficiency changes.

By and large, in contrast to the performance of the entire Islamic banking sector, our results show that both the IBB and the BBI experienced preliminary a remarkable growth in technical efficiency prior to the financial crisis, but unexpectedly faced significant declines after the emergence of the crisis, primarily due to lack of management skills. Nevertheless, IBB and BBI

continue to produce better substantial increase in technical efficiency as compared to some of other Islamic banks from Muslim-majority countries.

In comparison with conventional banks in BiH banking sector, BBI showed superior performance in its total productivity and technical efficiency. The bank's progress in total productivity is originally attributed to the constant improvement in it's technological innovation. BBI, however, progressively loses its superiority over other banks in terms of both indices (i.e. TFP and TE). Despite of that, the bank still clearly retains high mean growth rate in both indices over the sample years. However, the improvements in management practices appear to be less important source for future growth in the bank's technical efficiency performance, as compared to the optimal size component.

Similarly, IBB relatively recorded, as compared with conventional banks in the UK, high average regress in total productivity performance motivated mostly by the bank's regress ($TECch_{05\text{-}08} < 1$) in the (average-years) innovation component. This is apparently despite the yearly consistent upward trend in the bank's technology innovations. IBB, however, is perpetually lagging behind its counterparties banks in terms of technical efficiency, largely due to the acute inferior management operations.

In terms of the ordinary least squares (OLS)-regression analysis, overall results suggest that the more efficient Islamic banks are larger in size, show significantly greater profit potential, have less tendency to acquire high levels of debt, and have increased investment in skills. Finally, a more efficient use of banks resources is strongly associated with a higher GDP-per capita.

7.2.2.3. Proposed paper 3: X-efficiency and financial performance of investment, wholesale and private Islamic banks relative to conventional banks in Switzerland and the UK

The presented results suggest that the Islamic investment, wholesale, and private banks operating in Europe are technically inefficient, on average TE = 98% <1. Bank's inefficiency appears to be mostly due to the choices of inputs price mix and the bank's sub-optimal (inadequate) size of operations. Islamic banks, however, still maintain much higher mean technical efficiency scores than conventional banks. Bad management is the main driver of conventional bank's technical inefficiency. Benefiting from their large size (total assets), conventional banks are slightly better at controlling costs than Islamic banks. Islamic banks also

experience, to a certain degree, low (cost)-efficiency (CE), with overall scores of 49.3%, and poor allocative-efficiency (AE), with average scores of 49.4%, compared to conventional banks.

Our findings also show that the conventional banks have a decreasing return-to-scale of efficiency scores. This suggests that the banks should shrink their output endowments. Islamic banks, by contrast, are operating at either constant or increasing return-to-scale. This clearly indicates that the managers of Islamic banks are better at utilizing all factor inputs than their conventional counterparts.

Additionally, the findings reveal that the Islamic investment banks that are operating in Europe show a clear paradox between their high-efficiency scores and low-profitability performance. Islamic investment banks are less risky, more solvent, but suffer a gradual deterioration in liquidity position. The banks' supply of Murabaha (mark-up) financing appears to be the most dominant and has increased significantly over years.

Finally, the inter-temporal analysis of the bank's profitability, liquidity, risk and solvency, and efficiency, in pre- and post-crisis of 2007, does not show any statistical significant differences. Meanwhile, the ratio that measures the bank's community involvement (commitment to economy and Muslim community) exhibits a significant difference. This indicates that the bank is committing to support long-term development projects along with the short-term financing.

7.3. Further work

This thesis seems to have raised plenty of questions that have been reasonably answered. It has also highlighted a number of topics on which further research would be beneficial to expand and strengthen the results. Because the current work analyzes the comparative efficiency and productivity performance of the European Islamic banks using both the DEA technique and the DEA-Malmquist approach, it would be an asset to the work if the results are proven by applying alternative methodologies to the same data. To this end, we could, for instance, use either the stochastic frontier approach or the deterministic frontier approach. Additionally, it is useful to change the DEA input and output mixes and/or to extend the empirical analysis to cover more Muslim and European countries which have started recently to operate in accordance with Shari'ah law in banking operations. Furthermore, due to the short time (history) over which Islamic banking has been operating in Europe and consequently the absence of readily available high quality financial data, our analysis was carried out utilizing only 4-years, between 2005 and

2008, and subsequently, we can significantly increase the robust of our results by covering longer time intervals (e.g. 2005-2011). We finally could present a new perspective on performance evaluation of the Islamic banking operations in Europe by investigating, for the first time, the relative efficiency, productivity, and (cost) and (profit) X-efficiency levels, of the full-fledged Islamic banks and the conventional banks' Islamic windows which are operating in both Muslim-majority countries and Europe.

Another area of further work is to examine the hypothesis that the ethical investment has inferior performance relative to their unscreened benchmarks. Using traditional performance measurement techniques, we can test, for example, whether returns earned by investors who purchase shares in the FTSE Global Islamic Index are apparently different from their index counterpart FTSE All-World Index, both in the short and long-run. This will highlights the impact of the ethical screening on the performance of FTSE Global Islamic index. It is also very much useful to investigate the performance of the FTSE4 Good index, which is a recently established socially responsible index, and to compare it robustly with the FTSE Global Islamic and FTSE All-World indices. Islamic equity fund, however, can also be examined by employing a number of performance measures such as: Sharpe, Treynor, Jensen-Alpha and their variants.

Finally, one of the fields that can be differently analyzed in recent times is the Islamic bond markets. More specifically, we could measure the comparative performance of the Islamic bonds (Sukuk) against the traditional (conventional) bonds over a certain time period. In such a study we can empirically examine the yield to maturities of Sukuk and conventional counterparts for various issuers. We can also investigate the impact of the issuance of Sukuk on risk structure of a firm, discuss the possible underlying reasons, and assess the role and the overall impact of credit ratings in the Sukuk performance.

Curriculum Vitae 1-2

Personal Information

Name: Ahmad M. Abu-Alkheil
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Education

1996-1997	General Secondary Education (GSE): ranked 3rd at the Governorate level (90.7 out of 100%)
1997-2000	B.A.-Major: Business Administration- the University of Jordan: ranked 4th out of 53 student (3.19 out of 4)
2002-2004	MBA-Major: Finance-the University of Jordan: ranked within the top 10 at the graduate level (3.41 out of 4)
17.07.2102	Ph.D. (Dr.Oec) holder in Economics and Business Administration Sciences with specialization in Banking and Finance. Thesis title: "Ethical (Islamic) Banking and Finance: A Theoretical and Empirical Framework for the Cross-Country and Inter-Bank Analysis of Efficiency, Productivity, and Financial Performance"-Universität Hohenheim-Germany: magna cum laude (1,3 out of 1)

Work Experience

2001-2005	Dean assistant for finance and administration; Supervisor & accountant at Al-Balqa Applied University (BAU).
2004-2008	Part time lecturer & Trainer at Arab Academy for banking & Financial Sciences (AABFS).
2005-2008	Assistant lecturer; Assistant finance director; Internal auditor; and accountant at the German Jordanian University (GJU)-Jordan
2009-2012	Ph.D. candidate at the Faculty of Business, Economics and Social Sciences, Institute of Financial Management, Department of Banking and Finance, Universität Hohenheim-Germany

Abu-Alkheil, A., Burghof, H-P., Khan, W. (2012) "Islamic Commercial Banking in Europe: A Cross-Country and Inter-Bank Analysis of Efficiency Performance", International Business & Economics Research Journal (USA), Vol. 11 No. 6, pp. 647-676. Available online at: http://journals.cluteonline.com/index.php/IBER/issue/current

Abu-Alkheil, A., Burghof, H-P., Khan, W. (2012) " Comparison of Efficiency and Productivity changes of Islamic and Conventional Banks: Evidence from Europe and Muslim-majority countries", Journal of Applied Business Research (USA), Vol. 28 No. 6 (Forthcoming: November/December).

Abu-Alkheil, A., Burghof, H-P., Khan, W. "X-efficiency and Financial Performance of Islamic versus Conventional Banks: Evidence from Europe". *Under review*.