DOES ISLAMIC BANK PERFORMANCE DIFFER BY REGION?

A STUDY ON THE CHARACTERISTICS THAT IMPACT PROFITABILITY WITHIN ISLAMIC BANKING AMONG ITS MAIN GEOGRAPHICAL REGIONS

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ABSTRACT

This paper seeks to examine the determinants of the profitability of the Islamic banking sector during the period 1999-2007. The empirical findings from this study suggest that equity/total assets, non interest-earning assets/total assets, bank credit/GDP, GDP growth and GDP per capita have statistically significant impact on world-wide Islamic bank profitability. My data reveal differences in level of profitability within Islamic banking among its main regions. Middle East represents the region with highest profitability and South Asia is reported having the lowest profitability. With subsequent analysis I also find that the impacts of the determinants on Islamic bank profitability are not uniform across the regions. There exist significant differences among the regions in the impact of equity/ta and customer and short term funding/ta. The ratios are reported negatively related to profitability in South Asia but positively in the other regions. A high non-interest earning assets/ta appears to lower profits in the Middle Eastern region while it has a positive impact on profits in North Africa and on return on equity in South Asia. GDP growth is a determinant of profitability in Middle East and North Africa, although the impact is significantly differing between the regions, with a positive impact in Middle East and a negative one in North Africa. GDP per capita, the income level of the country, only appears to affect profits directly in North Africa and the relation is reported positive. However, when investigating the income level's impact of the level of influence of the bank-level variables on profitability, the findings reveal a statistically significant impact among all regions. The results also indicate that the impact of the interaction variables differs significantly between regions. Finally, the oil price is found determining profitability in North Africa and South Asia. The relation is positive in North Africa and the reverse in South Asia.

Key words: Islamic banking, profitability, oil price, bank development

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1. Introduction

Islamic banking has over the past years been characterized by a high growth at an average annual rate on 15 to 20 percent (Hasan and Coyle 2008). Expansion has been driven by high oil prices, which have increased the wealth in the Middle East where the largest part of Islamic banks exist. Currently, the size of the Islamic banking is close to US$ 400 bn in assets globally (The Boston Consulting Group 2008). Islamic banking is dating only from the 1970:s although the principles on which it is based date extensively back in time. The main function of Islamic banks is to offer financial services in line with the principles of the Quran. Some of the key characteristics are the prohibition of *riba*, interest and the proscription of speculation. Other aspects of Islamic banks are transparency, risk-sharing and ethical investing which also have increased the demand of non-Muslims of the Islamic bank services (Steward 2008). During the current tougher economic situation, Islamic banks have demonstrated a stronger resistance than many of their conventional counterparts (Moody's 2009).

Recent growth within Islamic banking has also led to a broader geographical coverage. The number of Sharia-compliant financial institutions worldwide has risen from one institution in one country in 1975 to more than 300 institutions operating in more than 75 countries today (Hassan and Coyle 2008). Islamic banks are so far more region specific than conventional banks due to the Islamic religion's limited geographical coverage. The main regions are Middle East, South Asia and North Africa. Despite the same religion, factors such as economic structure and regulation, historical background, degree of liberalization, social norms, and interpretation of the religious guidelines are differing between regions. Therefore, in order to fully understand the principles of Islamic banking it is of interest to adapt a regional perspective when analyzing the industry.

This thesis makes an attempt to increase the awareness and understanding towards Islamic banks and its underlying performance mechanisms. Evaluation of bank performance is important for depositors, bank managers, and regulators. Monitoring performance gives insight and knowledge in what impact profitability, which could lead to enhanced capability of avoiding financial failure in the future. Observing return ratios is of particular importance within Islamic banking as depositors do not have the right to pre-fixed return, such as interest, but depending on the performance of the bank. The Islamic banking business model is from many perspectives highly similar throughout the world, it is however of interest to define whether the determinants of profitability remain the same in all geographical regions. There exists previous research in the area of Islamic banking and profitability but to the best of my knowledge no research allowing for regional differences. Previous research on Islamic banks has not included the oil price as an explanatory variable of bank performance. Due to the heavy reliance of the oil in a large part of

the countries in the sample I will take into account potential effects of oil price movements on the bank profits by adding the oil price as an explanatory variable.

 The main objective of this study is twofold, firstly to examine the determinants to overall Islamic bank performance and as a second step I investigate the differences/similarities in level of performance between the three regions. With regression analysis I aim to find out whether potential regional differences are due to different profit determinants amongst the geographical regions or whether they are due to different levels of the explanatory variables. The examined independent variables are mainly based on previous research and consist of 1) banking characteristics, 2) macro variables, 3) financial structure variables and 4) an oil variable (global variable). Furthermore, some determinants have been interacted with the country's GDP/capita level to investigate whether the determinants impact on performance differ with the level of income in the country. The analysis is based on a sample of 97 banks, operating in 19 countries from 1999 through 2007.

1.1 Research questions

I. *What are the determinants of Islamic bank performance?*

II. *Does the performance of Islamic banks differ amongst its main regions?*

III. *Can this difference in performance be explained by different levels of the determinants or a different impact of the determinants?*

1.2 Outline

An introduction to the topic of the study has already been presented in the first section of the thesis. The continued structure proceeds as follows. In section two the background and a summary of empirical findings from previous research relating to the topic are given. The main geographical regions and their key characteristics will be presented in Islamic bank geography. Consequently, the research focus is given a more detailed introduction. The dependent and explanatory variables are then presented. Characteristics of the data set and its implications for treatment of the regression equations are reviewed in the Data collection section. In the Methodology section, regression specifications are presented. In the section of Empirical evidence the results are presented and analysed. Lastly, the findings of the thesis are summarized and additional interesting areas of research related to the topic of the thesis are discussed.

2. Background and previous literature

2.1 Islamic banks

One of the key characteristics of Islamic banking is the prohibition of *riba*. Riba means a pre-determined (fixed or variable) fee for the use of a loaned real or financial asset, often translated into interest. The Quran states "Believers! Do not consume riba, doubling or redoubling…" (Ch.3, verse 130). To charge interest from someone who is constrained to borrow to meet his essential consumption requirements is considered an exploitative practice in Islam (Zaman and Movassaghi 2001). The concept of profit however is lawful if fairly earned. The Sharia boards, religious councils, of the Islamic banks ensure that the guidelines of the Islamic laws and ethics are being respected in all banking activities (Carter 2001). Such need of compliance with Sharia religious law often result in quite complex structures of the bank activities. The Islamic bank main source of income constitutes of service charges, fees and profit collecting. There are mainly three kinds of Islamic banking: Pure Islamic banks, fully Islamic divisions and Islamic windows in conventional banks. The two first offer only Sharia compliant products whereas in the last version Islamic products are sold alongside conventional products. The geographical dispersion of Islamic banking cover more than 70 countries, the largest part of these operates in Middle East and South Asia.

There are five basic categories of financial contracts that Islamic banks offer: 1. Non-interest bearing demand deposit, e.g. checking account 2. *mudaraba*, 3. *murabaha*, 4. *musharaka* and 5. *ijara* (Zaman and Movassaghi 2001). Non interest bearing demand deposits is regular checking accounts where customers deposit money without earning an interest on them. In theory the Islamic banks should not charge any fees for these accounts, but in practice service fees are common depending on size of deposit.

The *mudaraba* constitutes of a profit-loss sharing formula. The depositors in these accounts entrust their funds to the bank which invest the money and then share the profit according to a pre-determined contract. There exist slight variations in the different forms of the *mudaraba*, but the main principle is the same.

Murabaha, cost plus financing, is an instrument where the institution buys a good on the behalf of the client and then resells it with a mark-up to the client/borrower. Just as with *mudaraba* there are other variations of this instrument but all with the same underlying concept.

Musharaka is equity financing through joint ventures. It can be compared to *mudaraba,* but in this case the bank does not only supply with money but also management. That is, the bank also shares the entrepreneurship with the borrower.

Ijara, sometimes referred to as rent-to-own, means leasing, one form constitutes of the lessee paying the lessor installment payments that go towards ultimate purchase of the equipment by the lessee (Zaman and Movassaghi 2001).

The "profit" rates of Islamic banks are often argued not being very different from interest rates of conventional banks (e.g. Ariff 1988 and Chong and Liu 2009), as these increases consistently as the time length of deposits increases just as with traditional interest rates.

The proportion of use of these mentioned different instruments varies across countries and in general there is a lack of standard banking practices across Muslim countries (Zaman and Movassaghi 2001).

2.2 Islamic banks and profitability

The determinants of bank profitability have in previous literature mostly been defined in two categories; internal and external (e.g. Bashir 2003). The internal determinants are controlled by the management of the bank, such as capital ratios, while the external determinants are beyond their control, such as economic situation etc.

Bashir (2003) assessed the performance of Islamic banks in the Middle Eastern countries during the period 1993-98. The primary focus of this paper was to establish the relationship between bank variables and performance. He also assesses the impact of external variables, such as macro indicators and financial structure variables on performance. Equity to total assets, loans to total assets and inflation was found significant and positively related to profits. The findings also revealed a significant negative relation between non-interest earning assets/total assets and bank profits. Bashir and Hassan (2003) extended this study by including South Asian and North African countries as well over the time period 1994-2001. They found that Islamic banks' profitability responds positively to the increases in GDP growth and concentration and negatively to increases in loans/total assets and non-interest earning assets/total assets and bank credit/total assets of the banking system.

There has been research on the differences in profitability between conventional and Islamic banks; Kader and Asarpota (2007) found in their study that Islamic banks in the United Arab Emirates are relatively more profitable, less risky, and more efficient as compared to the conventional banks in the country. Samad (2004) examined in his paper the comparative performance of Bahrain's interest-free Islamic banks and the interest-based conventional commercial banks and he did not find any major difference in profitability performances between Islamic banks and conventional banks.

2.3 Conventional banks and profitability

Demirgüc-Kunt and Huizinga (2001) studied the impact of internal and external determinants on bank performance during the time period 1990-1997. The main focus of the paper was to assess the impact of financial development on bank profitability and how countries reliance on bank versus market finance affects the profitability in banks in general. They based their research on previous studies made by Demirgüc-Kunt et al (1998) who found that developing countries have less developed banks and stock markets in general. In the study it was found that the financial sector (banks etc) becomes larger, more active and more efficient, as countries become richer. Dermirgüc-Kunt and Huizinga (2001) examined whether banks operating in different financial structures show differences in performance (in terms of profits margins). Their findings revealed that financial development has a significant impact on bank profitability. They found that greater bank development decreases profitability due to the tougher competition among banks implied. As proxy for bank development credit to the private sector by deposit money banks to GDP was used. Stock market development was found significant and positively related to profits in underdeveloped financial systems. However, they did not find any significant relationship between financial structure per se (bank or market based) and bank performance. The findings of the study also revealed significant impact of equity/ta, loans/ta, overhead/ta, inflation and tax rate on bank profitability.

Essayyad et al (2003) investigated the determinants of bank performance[1] in the oil dependent country Saudi Arabia. As revenues from oil exports represent the major source of national income in a highly oil reliant country, it was hypothesized that an upward shift in oil price would increase these revenues. The empirical findings of the study also revealed a significant relation between oil price and bank profitability. The relation was found positive corresponding to expectations.

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[1] Both Islamic and conventional banks were examined

3. The Islamic bank geography

In the following section a brief overview on the banking sector in the main regions of Islamic banking examined in the study is given. Middle East and South Asia are the largest markets, but the North African market, despite a current small size, is growing in significance (Economist 2008).

3.1 Middle Eastern Islamic bank sector

Middle East is in this study represented by Bahrain, Iran, Jordan, Lebanon, Qatar, Saudi Arabia and Yemen. The total value of Islamic bank assets in these countries is US$ 289 bn in 2007. The market is characterized by a relatively high income level and competition that is intensifying and a high percentage of customers whose primary concern is product purity. The Islamic bank market share is around eleven percent of the total bank market.[2] The region has an overall high economic development, but its countries range from being very poor, such as Yemen, to being extremely wealthy, such as Qatar, United Arab Emirates and Kuwait. The region is highly oil reliant. Four of the countries are among top ten of oil exporting countries in 2007; Saudi Arabia, Iran, United Arab Emirates and Kuwait (EIA 2009). Jordan and Lebanon are the only net oil importers among the region in the sample. The largest oil reserves are to be found in Saudi Arabia where 20 percent of the known oil reserves are in the world (CIA World Factbook 2009).

3.2 South Asian Islamic bank sector

South Asia East is in this study represented by Bangladesh, Brunei Darussalam, Indonesia, Malaysia and Pakistan. Total Islamic bank assets in these countries are US$ 32 bn in 2007. Sharia boards are considered somewhat less strict in South Asia than in the Middle East. The region has a more developed and experienced conventional banking sector than both the North African and the Middle Eastern region (United Arab Emirates Commercial Banking Report 2009). The income level is slightly lower than the Middle East but higher than North Africa. The key market in the Asian region is the Malaysian market that has been defined as having the most developed Islamic financial system (Chon and Liu 2009) and Kuala Lumpur's importance as Islamic financial center is increasing. The Islamic bank market share is around five percent of the total bank market.[3] Many of the banks in Asia are the result of Middle Eastern banks extensive expansion in these regions (Ford 2007), one example is the Al Rajhi bank and the Dubai Islamic bank in my sample that both have banks in South Asia but origins in Middle East. Among the

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[2] According to the calculation based on sample data. Calculated in size of assets
[3] According to the calculation based on sample data. Calculated in size of assets

Islamic bank customers in the South Asian region a large part are non-Muslims, this percentage is estimated around 70 percent of total client base (Fittipaldi 2004).

In the South Asian region Malaysia and Brunei Darussalam are the only net-exporters of oil (EIA 2009).

3.3 North African Islamic bank sector

Islamic banking is in Africa currently restricted to the countries in the North since this is where the Islamic religion has it broadest coverage. North Africa is in this paper represented by Sudan, Gambia, Mauretania, Tunisia and Egypt. Most African countries still operate in risky financial environments, with weak legal institutions and loose enforcement of creditor rights. However, progress has been achieved by many African countries in banking through supervisory and regulatory reforms, and there have been attempts of structural reforms to reduce financial risks and promote financial development (Flamini et al 2009). The North African countries in the sample have a total of Islamic bank assets of US$ 9.3 bn in 2007, which is considerably smaller than the Middle East and South Asia. Moody's credit rating agency has however estimated the African Islamic bank market to have a potential future market of $US 235 bn (The Economist 2008). Islamic banks' market share of total bank sector in North African countries is 15 percent.[4] This is higher than in both Middle East and South Asia, which reveals that the importance of Islamic banking in terms of proportional impact is highest in North Africa.

Sudan is North Africa's main Islamic banking market, with more than half of Africa's Islamic banking assets (The Economist, 2008). The country is highly oil dependent as oil sector is driving the country's growth. Its revenues from oil exports represent 70 percent of the country's total export revenues (EIA 2009). Sudan is the only net oil exporter among the North African countries in the sample.

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[4] According to the calculation based on sample data. Calculated in size of assets

4. Research focus

First, I will study the relation between selected explanatory variables and Islamic bank profits worldwide. This gives an initial overview of the main drivers of profitability in Islamic banking and contributes to existing literature by a) adding new determinants and Islamic bank market share and b) extending the time period. The first new variable that will be introduced is oil price that previously only has been assessed on the Saudi Arabic market. Since large parts of the Islamic countries also are oil-reliant, oil price movements are expected to affect profitability. The second new variable to be introduced is Islamic bank market share in total bank sector. The Islamic bank degree of dominance in the total bank sector is expected to influence its profitability. Finally, country risk is introduced, which measures a country's risk of credit default, and is used as a proxy for the systematic risk in the country. The logic behind the introduction of the variables is that according to standard financial theory, systematic risk and returns are interlinked. The first research question is:

I.   What are the determinants of Islamic bank performance?

My second intention is to examine whether the levels of performance of Islamic banks vary between the geographical regions. As previously mentioned riskier assets should be remunerated with higher returns. Bank profitability should reflect the non-diversifiable systematic risks associated with the macroeconomic environment. As a proxy for macro economic risk I have introduced country risk as an explanatory variable, which is retrieved from OECD and defined as "the likelihood that a country will service its external debt". It is hypothesized that the North African countries will have the highest country risk, and in line with standard financial theory hence also higher profitability than the other regions.

Demirgüc-Kunt and Huizinga (2001) found that higher bank development has a negative impact on profitability. The result is intuitive as higher bank development should reduce market imperfectness and through higher competition profit margins are lowered. Bank development can also be viewed as an indicator of risk as a higher bank development intuitively should lower the risk in the sector.

However, there are also contradictory arguments for the functioning of Islamic banks as a luxury good with superior performance in developed markets. Anouar Hassoune, vice president and senior credit officer of Moody's, states: "Islamic banking is a luxury product; it tends to do better in places with established banking systems" (Economist 2008). I assume his definition of "established banking system" would imply a high bank development. A positive relation between bank development and performance is contradictory to evidence from Demirgüc and Huizinga's (2001) studies on conventional banks, and whether it holds in Islamic banking needs to be examined empirically.

I will in this study define bank development, in accordance with method used by Demirgüc-Kunt and Huizinga (2001), as bank credit/GDP and define bank systems as underdeveloped if below the sample mean. If Demirgüc-Kunt and Huizinga's empirical evidence of a negative relation between bank development and profitability will hold in my sample as well I will expect the regions above the sample mean to have lower profitability than regions below. I will investigate which theory that appears to hold within Islamic banks by comparing the credit ratio with the profit rate in each of the region. Subsequently I will more formally test for bank development's degree and direction of impact on profits by regression analysis. Except for differences in profits between regions created by differences in the levels of the selected explanatory variables (such as bank development), there might also be differences caused by different *impact* of the explanatory variables. The second research question is as follows:

II. Does the performance of Islamic banks differ amongst its main regions?

In earlier studies on Islamic banking, no differential effect between regions has been allowed. Studies have been conducted on all Islamic banks worldwide, and a flaw with these studies is they have assumed the same determinants of profits in all regions. Since both customer behaviours and regulation vary widely between the geographical regions in the sample, it seems erroneous to assume the same behaviour of the profit mechanisms. My third intention is therefore to examine the underlying causes of potential differences or similarities in performance. If no significant differences in the effect of the determinants among regions are found, this indicates that the differences/similarities in performance between regions mainly are fully due to differences/similarities in levels of the explanatory variables (e.g. different bank development). If on the other hand I find that there are significant differences in the explanatory variables' impact, I can consequently conclude that differences/similarities *cannot* fully be explained by different levels of the explanatory variables. E.g. seemingly similar levels of the determinants between regions do not contribute in the same magnitude to the performance level. Potential causes of a difference in the impact of determinants can be factors such as historical background, economic structure, social norms etc. The final research question is thus:

III. Can these differences/similarities in performance amongst regions be explained by different levels of the determinants or a different impact of the determinants?

5. Variables

In the following section I discuss the expected relationship between the performance of Islamic banks and the chosen set of internal and external explanatory variables. The internal variables constitute of bank variables and the external variables constitute of financial structure variables, macro indicators and a global variable. The bank variables have been used in previous studies of bank profitability by Demirgüc-Kunt and Huizinga (2001), Bashir (2003) and Hassan and Bashir (2003). As for financial structure variables bank credit was also assessed in these studies. Hassan and Bashir studied concentration as well which also have been included in my study. In addition, Islamic bank market share has been added as an additional financial structure variable in this study. Demirgüc-Kunt and Huizinga (2001), Bashir (2003) and Hassan and Bashir (2003) also studied the effect of macro indicators. In addition to macro variables used in their studies, country risk has been added in order to capture the macro risk. Furthermore, in line with Essayyad et al's (2003) study the oil price is added as an explanatory variable.

5.1 Dependent Variables

Due to the complexity of performance it can be measured and defined using several methods. In general, performance is evaluated by analyzing accounting data contained from the company's balance sheet and income statement. I will in this paper use return on assets (ROA) and return on equity (ROE) as performance measures representing the bank's ability to generate revenue. ROA is calculated as net income to total assets and ROE as net income to equity. In Islamic income statements the structure in which net income is calculated vary slightly amongst banks. However the principle is the same; the net income consists of revenue generated by Islamic bank activities such as mark-up (*Murabaha*), rent-to-own (*Ijara*), profit/loss sharing (*Mudaraba*) and service charges, extracting the expenses of carrying such operations. ROA is often used as a measure of operating efficiency; it conveys information on how well the bank's resources are being used in order to create income. However, ROE is measuring how well the management is maximizing value of the owners' equity and this is often viewed as the main objective of a bank. ROE is affected by its ROA as well as by the bank's degree of financial leverage. Since returns on assets in general tend to be lower for financial institutions, most banks use heavy financial leverage to increase return on equity to a competitive level.

Except being used as indicator of performance, profit margins can also be viewed as an indicator of bank efficiency and stability. Demirgüc-Kunt and Huizinga (1997) emphasize that policy makers have an interest in promoting both stability and efficiency in banking sectors. Stability requires sufficient profitability while economic efficiency requires banking spreads that are not too large. Economic efficiency implies a larger competition that is reflected in lower profits. Another version of efficiency is the operating efficiency, which indicates how effectively the bank is managing its costs. According to this

definition efficiency can increase profitability as the expenses are lowered. Thus, the direction of the impact of profitability efficiency depends on whether one adopts an economic or operational definition. A prerequisite to formulating the most effective banking policies, in operational and economical terms, is to understand the determinants of bank profitability.

5.2 Explanatory Variables

I will start by discussing the internal determinants, which are bank-level variables that measures the earning power and the cost side of banks. Furthermore, I will continue with the external determinants; non-bank specific variables that vary across countries and over time. Firstly, macro determinants are discussed, followed by financial structure variables. Lastly, the impact of the oil variable, that is neither bank nor country specific and only varies over time, will be hypothesised.

5.2.1 Bank-level variables

Demirgüc-Kunt and Huizinga (2001) and Bashir (2003) found in their studies of the determinants of bank profitability a statistically significant positive relationship between equity to total assets and profitability. This could either be due to that profitable banks remain well capitalized or that well capitalized banks will have access to cheaper sources of funds with subsequent improvement in profit ratios. Hassan and Bashir (2003) found evidence of a negative relation between the equity ratio and return on equity. Demirgüc-Kunt and Huizinga (1997) also found a positive relationship between the ratio of bank loans to total assets, loans/ta, and bank performance. Bank loans are expected to be one of the main sources of revenue and are therefore expected to be positively correlated to profitability. But since most loans within Islamic banking are according to the profit and loss sharing form, the correlation between loans/ta and bank profit is expected to depend on shifts in the economy. During tougher economic times the default rates of profit/loss sharing loans will increase and hence the bank profits will therefore decline. Hassan and Bashir (2003) found in their study of Islamic banks a negative relation between loans and profits.

In Demirgüc-Kunt and Huizinga (2001) study of conventional bank profitability the ratio of non-interest earning assets to total assets is reported as lowering profits. The logic behind this relation is that since interest is the main income of conventional banks, the ratio of assets that do not earn interest is expected to decrease profitability. Since earnings of the Islamic banks come from non-interest activities, the ratio of non-interest earning assets to total assets is expected to be positively correlated to returns. The variable was however despite this argument found negatively impacting profits in Hassan and Bashir (2003) and Bashir's (2003) study on Islamic banks.

The ratio of customer and short-term funding to total assets, is a liquidity ratio originating from the liability side. Examples of liquidity holdings are current deposits, savings deposits and investment deposits, which all represents an expense to the bank. An increase in this expense is hypothesized to decrease the profit margins. The variable was not found significant in Hassan and Bashir (2003) and Bashir's (2003) studies.

Overhead cost reflects employment, total amount of wages and costs of running branch office facilities. Overhead to total assets is expected to be negatively related to profitability as it increases the expenses of the bank. A decrease in overhead could be caused by electronic replacements of services that traditionally needed labour, e.g. an increase in ATMs would lower wage expenses. The variable is, contradicting to these arguments, found positive and significant in Demirgüc-Kunt and Huizinga's (2001) study. Hassan and Bashir (2003) and Bashir (2003) do not found the determinant significant.

Size is measured as total assets. The variable allows us to control for cost differences related to the greater ability of larger banks to diversify. Larger banks are expected to gain from economies of scale, indicating that they are able to increase their operating efficiency and thus decrease the cost. Conventional bank size has earlier been linked to performance, e.g. Emery (1971) and Smirlock (1985). Emery and Smirlock found that the larger banks had greater returns. Hassan and Bashir (2003) found however a significant negative impact of size on return on equity.

Previous research show different impact of tax to before tax profit. Hassan and Bashir (2003) find in their study that a higher tax ratio lowers bank profitability. Demirgüc-Kunt and Huizinga's (2001) findings reveal a positive impact. A positive relation suggest that banks in environments with high taxation have to earn higher pre-tax profits to pay these taxes and the result is that the effect of the higher taxes are not passed over to the bank customers and shareholders. A negative relation indicates that the banks pass their higher taxes over to the customers and shareholders in terms of fewer profits.

5.2.2 Financial structure variables

The Islamic bank market share in the total bank sector is measured as Islamic bank assets to total bank assets in the country. A higher market share should imply a larger ability to set prices, and this implies higher profit ratios. But the expected effect is not clear, since despite a large market share the market may be very dispersed and due to the competition among them the prices will be decreased and consequently the profitability. This study aims to investigate whether the Islamic bank market share impact profitability and in that case in which direction.

According to economic theory market power should have a positive influence on profits. In my sample the impact of market power will be assessed by using the same definition as Hassan and Bashir (2003); the

ratio of the three largest Islamic bank assets to total Islamic bank assets in each market. I assume that the level of concentration in a market has a direct impact on the degree of competition among the banks on the market. A higher concentration and thus lower competition should indicate a larger possibility for the banks to act price-setters, and an increased capability of adjusting spreads in response to unfavorable changes in the macroeconomic environment to leave returns unaffected (Flamini 2009). The positive relation between concentration and profits is also further strengthened by Essayad et al's study on Saudi Arabian banks (2003) and Hassan and Bashir's study on Islamic banks (2003).

The credit ratio, credit to the private sector by deposit money banks/GDP, measures the credit activity of the banking system. Demirgüc-Kunt and Huizinga's findings reveal that profitability is lower in countries with high bank development. The logic behind such relation is that the market conditions in a well developed bank sector allow for higher competition that will lower the profits. The negative relation is also strengthened by findings by Hassan and Bashir (2003).

5.2.2 Macro indicators

I use GDP per capita as an indicator of economic development in the country. A higher economic development would be expected to lead to a higher economic efficiency. The higher competition implied would decrease bank profits and therefore a negative relation between GDP per capita and profit is expected. Hassan and Bashir (2003) found this variable to be negative but non-significant.

GDP growth is used as a proxy of the economic cycle. It is expected that bank profits will rise in good economic times and decrease in recessions. These effects are expected as credit quality will decrease in recessions and therefore as the risk of default will rise, the bank returns are expected to be lowered. A positive and significant relation is also found in Hassan and Bashir's study (2003).

Bashir (2003), Demirgüc-Kunt and Huizinga (2001) and Bourke (1989) found that inflation is having a significant and positive impact on bank profitability. Inflation is therefore expected to positively affect profitability in my sample as well.

According to modern portfolio theory the rate of return depends on the systematic risk.[5] The amount of firm-specific risk is irrelevant, as an investor can eliminate the firm-specific risk by holding a diversified portfolio (Bradfield 2007). Country risk is included in the regression as a proxy of the systematic risk. Country risk measures the country credit risk, i.e. the likelihood that a country will service its external debt. The relation between country risk and profits is expected to be negative in line with traditional

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[5] The systematic risk represents the unpredictable variability of the earnings of a firm that is attributable to events that are systematic to the macroeconomic system in which the firm operates (Bradfield 2007)

financial theory stating that higher risk should imply higher profits. The variable has not been included as a determinant in previous research of bank profitability.

In order to determine if stock market size has a significant impact on performance, market capitalization to GDP as also used by Demirgüc-Kunt and Huizinga (2001), is introduced as an independent variable. Since only South Asia and Middle East have sufficient observations of this variable it is left out of the general regressions and results from the region specific regressions on South Asia and North Africa including market capitalization are reported in appendix. Demirgüc-Kunt and Huizinga found in their study that the variable has a positive impact to profitability. As possible explanations for this relation, they argued, could be that more information on public firms is made available which increase banks' capability to evaluate credit risk, it also allows firms to be better capitalized which can reduce the ratio of defaults on loans.

Each of the bank variables and inflation has been interacted with GDP per capita level in the country. By looking at the coefficients of these variables we can further understand the functioning of the single variables, since it indicates their dependency on the income level in the country. If the variable is positive and significant this suggests that the single variable's impact on the performance measure is higher in countries with higher income level and vice versa.

5.2.4 Global variable

As argued in previous sections the large reliance on oil export in many of the countries may imply a relation between oil price and profitability. The impact of the variable was not assessed in Demirgüc-Kunt and Huizinga (2001) or Hassan and Bashirs' (2003) studies. In countries where the large part of source of national income is oil it appears logical to investigate its impact on bank profits. Intuitively this impact should be positive as an oil price increase will strengthen the financial position of many of the Islamic banks' customers and thus loan default rate should decrease. In profit and loss sharing agreements the Islamic banks will now also gain from higher profits of the customers. If the oil price increases in an oil net exporting country so does the funding sources of the banks and thus also the profitability. A decline in oil prices does not necessarily have to represent a very pessimistic scenario for banks in oil exporting countries as government borrowing from banks in times of deficits is increasing. If government and major national companies are the few main customers (borrowers) this creates something called by economists as "oligoposony" (Essayyad 2003). The negative relation between performance and oil price indicated by this scenario might offset the former expected positive relation to performance. Essayyad et al (2003) found in their study on determinants of bank performance in Saudi Arabia, a highly oil dependent country, that profits are positively depending on oil prices. In a net oil importing region bank customer will be worse off by an increase in oil price. Thus, in a study covering both net oil exporters and net oil importers a positive effect of oil price rise in oil exporting regions might be offset by the negative impact

in net oil importing regions. The expected coefficient of oil price in my sample is depending on the degree of reliance of oil export in the sample regions. With the region specific regression I will be able to tell the difference in impact of oil price movements amongst Middle East, North Africa and South Asia. For the region specific regressions a positive impact is expected in particular the Middle East as it constitutes largely of oil exporters. Sudan's large oil dependence and dominance on the North African Islamic bank sector, might result in a significant positive impact of oil price on average profitability in the North African region. South Asia is mainly represented by net-oil importers and a negative impact of oil price on profitability is expected.

6. Data collection

The bank-level data of the Islamic banks' accounting statements are retrieved from Orbis. The search was based on bvdep identification number of Islamic banks in Bankscope. The dataset covers 19 countries, located in Middle East, North Africa and South Asia: Bahrain, Bangladesh, Brunei Darussalam, Egypt, Gambia, Indonesia, Iran, Jordan, Kuwait, Lebanon, Malaysia, Mauritania, Pakistan, Qatar, Saudi Arabia, Sudan, Tunisia, United Arab Emirates, and Yemen. The selection of countries is based on the countries used in previous studies of Islamic banking (Hassan and Bashir 2003 etc). The macro-level data have been extracted from International Monetary Fund's International Financial statistics (IFS), the country risk is from OECD and the oil price from Inflationdata. The sample covers the period 1999-2007. The sample is covering a total of 97 banks over nine years, but out of these only 69 have at least one year with full observations for each explanatory variable. I start with 467 observations of the independent variables, ROE and ROA, but due to missing values and errors in the data, the final number of observations is 280 (per independent variable). 136 observations for Middle East, 71 for South Asia and 73 for Africa. In terms of number of banks per region, Middle East has 57 banks of where 34 have at least one year with full observations for each determinant, the corresponding numbers for North Africa is 15 and 13 and for South Asia 25 and 22.

The value of total assets for all banks in my sample year 2007 is US$ 330 bn which roughly accounts for 75 percent of all Islamic banks worldwide according to The Boston Consulting Groups estimations (2008).

The country risk measures the country credit risk, i.e. the likelihood that a country will service its external debt. If this value varies throughout the year an average has been estimated.

There is significant difference in size of the assets in the sample among the regions. The Middle Eastern countries hold 87.5 percent of total Islamic bank assets in my sample, South Asia holds 9.7 percent and Africa holds 2.7 percent. The African market's seemingly small size in comparison to the other markets does not decrease its significance in the study due to high expected growth and high proportional impact on local markets.

Table I-III in Appendix D provide mean values of bank level variables, macro variables and financial structure variables. Highest returns on equity and assets are found in the Middle Eastern region, e.g. Bahrain (6 and 13 percent), Kuwait (7 and 20 percent) and Qatar (4 and 23 percent). Lowest returns on equity and assets are observed in South Asia, e.g. Malaysia (0.1 percent and 2 percent). Highest values of GDP per capita is observed in Middle East, Qatar is having the sample's highest value of around 30 000 USD. Lowest GDP per capita is observed in North Africa, with e.g. Gambia with a value of 313 USD.

Growth rates of GDP vary in the sample from Sudan and Qatar at 7 and 8 percent to Lebanon at 3 percent. The highest concentration of Islamic bank assets to total bank assets is in Sudan (21 percent), Brunei Darussalam (46 percent) and Iran (45 percent). Islamic market share is very low in Indonesia (0.3 percent) and Tunisia (1.6 percent). The African countries are showing the highest country risk level with Sudan, Gambia and Mauritania that all have with highest risk levels (7), the lowest risk countries in the sample are in the Middle East, e.g. United Arab Emirates (2). Bank credit to GDP is the credit to the private sector by deposit money banks divided by GDP. This variable is used as a proxy for bank development. As seen, credit is very important in Malaysia at 145 percent. Poorer country in the sample show lower levels of credit, e.g. Sudan at 6.7 percent and Yemen at 6.5 percent. In general my sample is characterised by a few large dominating Islamic banks in each country resulting in an overall high bank concentration ratio. The largest bank size is to be found in the Middle East with an average of US$ 3.9 bn USD. South Asia has an average bank size of US$ 1.1 bn and North Africa US$ 462 m.

7. Methodology

In order to estimate to what extent an Islamic banks' performance can be explained by the characteristics chosen for this thesis, panel data was used. Panel data is data where multiple cases are observed at two or more time periods (Princeton University, 2009). The case element of my panel is the Islamic banks. The time variable is the different years in the data, 1999-2007. The two performance measures, ROE and ROA are, on a yearly basis, calculated for each Islamic bank. The explanatory variables are also stated on a yearly basis.

Using Stata, a first sorting of the data by the panel variable, the Islamic banks, and then by the date variable within the panel variable is done. The case element and time variable are defined, then the regressions can be run. Each panel data regression estimates how well the performance measure could be explained by the explanatory variables, i.e. equity/ta, oil price, GDP/capita etc. See list of explanatory variables in table 7.1. Further details on specifications regarding treatment of autocorrelation, heteroskedasticity and multicollineraity is also to be found in this section.

Table 7.1. Explanatory variables

Equity/ta
Loans/ta
Non-interest earning assets/ta
Customer and short term funding/ta
Overhead/ta
Size (total assets)
Tax/before tax profit
Islamic bank market share
Concentration
Credit/gdp
Gdp per capita (logged)
Gdp growth
Inflation
Country risk
Oilprice (logged)
Equity/ta *gdppc
Loans/ta *gdppc
Non-interest earning assets/ta *gdpp
Customer and short term funding/ta
Overhead/ta *gdppc
Inflation*gdppc

Firstly, in model 1, I will regress the determinants' impact on Islamic bank profit in general across all regions; I will then proceed to geography specific regressions to obtain an overlook over the dynamics of profitability in each region. Model 2a will cover Middle East, model 2b will cover Asia and model 2c

covers North Africa. By studying these results we can observe potential differences between markets. In order to be able to determine whether the differences between the regions are significant, a dummy regression will be performed. In the dummy regression Middle East represents our base case and one dummy each is created for the North African and Asian market. The dummy variables are then interacted with each of the explanatory variables. By observing these p-values we can determine if the differences in regression coefficients seen in model 2.a-2.b are significantly different from zero. The results of the dummy regressions are to be found in Appendix G.

In order to avoid a disproportional strong influence of extreme data points on the parameter estimates I also adjust the sample for outliers that deviates more than four standard deviations from the mean of each variable. For the financial structure variables and the macro indicators no outliers are found. For the bank variables a small number of observations are classified as outliers (less than one percent of total number of observations) and are replaced with the average value of the remaining observations in the region that year. A linear equation is specified, where the performance measures, ROE and ROA, are related to internal bank ratios, macroeconomic indicators, financial structure variables and a global variable. The regression analysis is based on the following equations:

Model 1 and 2:

$$I_{ijt} = a_0 + \beta_i B_{it} + \gamma_j X_{jt} + \delta_j S_{jt} + \lambda O_{t} + \varepsilon_{ijt} \tag{1}$$

Where I_{ijt} is the measure of performance (ROE or ROA) for bank i in country j at time t. B_i are the bank level variables for bank i at time t; X_{jt} the country variables for country j at time t; S_{jt} the financial structure variables in country j and time t and O_t the oil variable at time t. a_0 is a constant and β_i, γ_j and λ are the correlation coefficients. Table 1 presents a list of all explanatory variables. Equation 1 is performed for a) all countries in order to give an overview b) per region to investigate if differences.

Model 3 (dummy regression):

$$I_{ijt} = \alpha_0 + d_1 \, a_1 + d_2 \, a_2 + \beta_i B_{it} + d_1\beta_1 B_{it} + d_2\beta_2 B_{it} + \gamma_j X_{jt} + d_1 \, \gamma_1 X_{jt} + d_2 \, \gamma_2 X_{jt} + \delta_j S_{jt} + d_1 \, \delta_1 S_{jt} + d_2 \, \delta_2 S_{jt} + \lambda O_t + d_1\lambda_1 O_t + d_2 \, \lambda_2 O_t + \varepsilon_{ijt} \tag{2}$$

Where I_{ijt} is the measure of performance (ROE or ROA) for bank i in region j at time t. d_1 and d_2 are dummy variables for region 2 and 3. α_0 is the intercept for the base case region, $\alpha_0 + \alpha_1$ the intercept for region 2 and $\alpha_0 + \alpha_2$ the intercept for region 3. The dummy variables d_1 and d_2 are interacted with each of the explanatory variables, B_{it}, X_{it}, S_{jt} and O_t. β_i, is the correlation coefficient of the bank-level variables for the base case region and $d_1\beta_1$ and $d_2\beta_i$ the correlation coefficients for the difference between the base case

region and region 1 and 2 (same relation for macro indicators, financial structure variables and the global variable).

The main regression technique used for analyses of panel data is fixed effects, since it gives consistent results. Fixed effects regressions use changes in the variables over time to estimate the effects of the explanatory variables on the independent variable (Princeton University, 2009). For the interpretation of the results to be robust, the statistical properties of the sample have been examined. Pairwise correlations between regressors show that the data does not suffer to any great extent from multicollinearity. Woolridge test for autocorrelation was performed where the null hypothesis of no autocorrelation not could be rejected in nine out of the ten regressions. One method of correcting for autocorrelation is by instead applying Feasible Generalised Least Squares (FGLS) as the regression technique. This regression method also corrects for heteroskedasticity, thus if applied there is no need to test if the samples are heteroskedastistic. Since the key objective of this paper is to compare results from the different regions, the use of different regression techniques could decrease the ability to interpret differences correctly. Therefore, to achieve consistency, the Feasible Generalised Least Squares approach is used in all regressions in this study, also for the one regression where no autocorrelation is found.

8. Empirical evidence

The results discussed below are based on regressions run on a data sample of Islamic banks in the selected countries 1999-2007. On the sample I have run two types of regressions. Firstly, general regressions are performed to see the determinants impact on the performance measures both worldwide and per each region separately. Secondly, a dummy regression is performed to investigate two of the regions differences to the selected base case region, the Middle East. Results from the dummy regression can be found in Tables IX and X in the Appendix G.

8.1 Investigating profitability on a worldwide level

Table 8.1.1 and 8.1.2 reports the impact of the selected variables on ROA and ROE within Islamic banks worldwide. The first bank-level variable is equity/ta, is reported having a statistical and negative relation to ROA, which is contradictory to Bashir's (2003) study on Islamic banks and Demirgüc-Kunt and Huizinga's (2001) on conventional banks. It is however also negatively related to ROE, which is corresponding to Hassan and Bashir's (2003) findings. This strengthens the evidence that high capital ratios reduce the returns on equity of Islamic banks. When I interact equity/ta with GDP per capita, the coefficient is positive and significant in the regression with ROA as dependent variable. Thus a higher level of income increases the impact of the equity ratio on ROA. For ROE the interaction variable is reported as not statistically significant.

My results show that the other bank level variables do not have a significant impact on ROA. Non-interest earning assets/ta have a significant negative impact on ROE, which strengthens Hassan and Bashir's findings that the ratio of non-interest earning assets decreases the profitability of Islamic banks. The results of the interaction variable with GDP per capita also reveal that non-interest earning assets tend to have a higher impact on ROE in countries with high GDP.

The Islamic bank market share in the total bank sector in the country does not appear to impact performance. This indicates that Islamic bank price-setting capacity is not increasing with size of Islamic bank market share.

The results indicate that country risk, used as a proxy for systematic risk, does not have a significant impact on profits. According to standard portfolio theory a positive significant relation is expected between systematic risk and rate of return. The deviation from this relation might be caused by a non-optimal choice of proxy.

Among the financial structure variables only credit to GDP has a significant impact on ROE. Profits appear to decline when the credit activity in a country increases, which is intuitive and supports the theory that in a well-developed banking sector, market conditions allow for higher competition that subsequently lowers the profits. These findings are also corresponding to previous studies of Hassan and Bashir (2003) and Dermirgüc-Kunt and Huizinga (2001).

GDP per capita is found inversely and significantly related to ROE. A higher GDP per capita in the country could be argued should lead to higher income that logically should increase the income of the banks. But a high GDP is also an indicator of a well developed economical system which implies a higher competition that lowers profit margins. Thus my results seem to support the latter argument.

GDP growth is reported as significant and positive on the two performance measures, which corresponds to Hassan and Bashir's (2003) findings. This is intuitive and indicates that during a flourishing economy, bank profits will rise.

Essayyad et al (2003) found a positive relation between oil price and bank profitability. The findings of this study reveal that no such relation appears to exist. This suggests that the Islamic bank profitability is not sensitive to oil price movements.

Table 8.1.1

Regression 1a. Determinants of Islamic Bank Performance (ROA)

ROA

Variable	Coefficient	Std. Err.	P-value
Equity/ta	-0,275	0,073	*0,000*
Loans/ta	-0,030	0,028	0,278
Non-interest earning assets/ta	-0,057	0,053	0,285
Customer and short term funding/ta	-0,046	0,054	0,394
Overhead/ta	0,021	0,316	0,948
Size (total assets)	0,000	0,000	0,759
Tax/before tax profit	-0,001	0,003	0,619
Islamic bank market share	0,016	0,012	0,182
Concentration	0,000	0,011	0,994
Credit/gdppc	-0,006	0,007	0,363
Gdp per capita (logged)	-0,010	0,007	0,137
Gdp growth	0,186	0,061	*0,002*
Inflation	-0,096	0,114	0,400
Country risk	0,002	0,002	0,182
Oilprice (logged)	-0,002	0,004	0,676
Equity/ta *gdppc	0,041	0,010	*0,000*
Loans/ta *gdppc	0,004	0,003	0,238
Non-interest earning assets/ta *gdppc	0,011	0,007	0,118
Customer and short term funding/ta *gdppc	0,005	0,007	0,472
Overhead/ta *gdppc	-0,041	0,043	0,330
Inflation*gdppc	0,018	0,014	0,219

Note: Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 280, number of groups: 69, observations per group min: 1, observations per group max: 9, observations per group average: 4. Ta= total assets

Table 8.1.2

Regression 1b. Determinants of Islamic Bank Performance (ROE)

ROE

Variable	Coefficient	Std. Err.	P-value
Equity/ta	-1,430	0,331	*0,000*
Loans/ta	-0,152	0,126	0,228
Non-interest earning assets/ta	-0,554	0,242	*0,022*
Customer and short term funding/ta	-0,346	0,246	0,159
Overhead/ta	-0,004	1,409	0,997
Size (total assets)	0,000	0,000	0,131
Tax/before tax profit	-0,016	0,012	0,193
Islamic bank market share	-0,016	0,054	0,763
Concentration	-0,071	0,050	0,151
Credit/gdppc	-0,119	0,030	*0,000*
Gdp per capita (logged)	-0,083	0,032	*0,009*
Gdp growth	0,839	0,277	*0,002*
Inflation	-0,687	0,522	0,188
Country risk	-0,001	0,008	0,895
Oilprice (logged)	-0,017	0,019	0,371
Equity/ta *gdppc	0,171	0,045	*0,000*
Loans/ta *gdppc	0,020	0,016	0,193
Non-interest earning assets/ta *gdppc	0,074	0,033	*0,025*
Customer and short term funding/ta *gdppc	0,043	0,032	0,187
Overhead/ta *gdppc	-0,117	0,184	0,524
Inflation*gdppc	0,102	0,065	0,117

Note: Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 280, number of groups: 69, observations per group min: 1, observations per group max: 9, observations per group average: 4. Ta= total assets

8.2 Investigating profitability on a regional level

I will proceed with a general discussion on the profit levels in the three regions. In accordance with Demirgüc-Kunt and Huizinga's (2001) method I will determine which regions that can be defined as having developed banking system. Finally, I will through regression analysis more formally investigate the relationship between bank development as well as the other selected determinants and bank profits.

The sample mean of the credit ratio in the sample is 0.55. Demirgüc-Kunt and Huizinga's (2001) definition of development in the banking sector will be used; a banking system above the sample mean will be defined as well-developed and a banking system below the mean as underdeveloped. The ratio of credit to GDP is in South Asia 0.8 which is above the sample mean. Consequently, it can be defined as a having a developed banking system. North Africa and Middle East are both below the sample mean (with ratios of 0.23 and 0.52) and thus defined as having underdeveloped banking systems. In line with Demirgüc-Kunt and Huizinga's results we would therefore expect South Asia's profitability to be lower than the other regions. Table 8.2.1 and 8.2.2 also reveals that this is the case and thus the sample appears to support their empirical findings. However for North Africa and Middle East the results do not give

support to previous evidence as North Africa with a lower bank development then Middle East is reported having lower profits. The difference in level of profitability might be caused by other factors than bank development; the reasons might as well be lying in the other selected determinants. In order to determine bank development's impact on profitability more formally it is necessary to observe the findings from the regressions. If its impact is found negative and significant the relation found by Demirgüc and Huizinga (2001) is proved valid also for Islamic banks. The findings of the non-region specific regression reveal that credit has significant negative impact on return on equity but not on return on assets. With region-specific regression I will now be able to investigate this relation further. Impact might differ between regions; a negative relation in one region might not imply that the same relation holds in another region. Different relations might also offset each other in the world-wide level regression resulting in seemingly non-existing impact of the variable.

Table 8.2.1

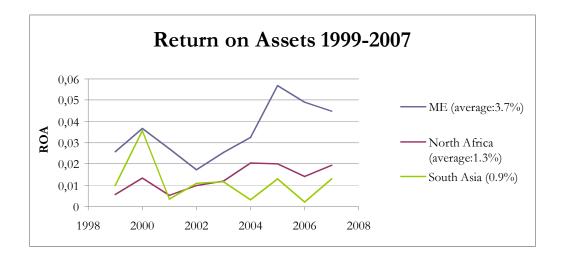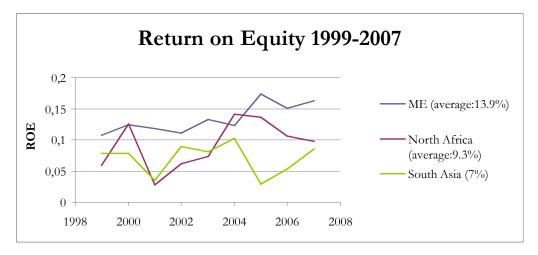ROA in Middle East, North Africa and Asia 1999-2007

Table 8.2.2

ROE in Middle East, North Africa and Asia 1999-2007

A bank is regarded as doing reasonably well if its ROA is 1 percent or better. In 1995, the average ROA for all banks in the U.S. was 1.3 percent (Federal Reserve Bank of Atlanta 1996). The average for Islamic banks in the sample region as a whole throughout the period 1999-2007 is 2.8 percent. The Middle Eastern region has the highest ROA on around 3.7 percent. However Islamic banks in North Africa and South Asia are having an average ROA same or lower than the US average on 1.3 percent and 0.9 percent. Thus it appears that the higher ROA in Islamic banks compared to conventional is explained mainly by returns in the Middle East.

The average ROE in the U.S. 2005 was 13.3 percent (Sparkman 2006). The average ROE over the time period in our sample is slightly lower at 11.7 percent. ROE in the Middle East is reported highest among the regions and South Asia the lowest.

From the graphs we observe that there are clear differences in performance of Islamic banks between regions. From regression analysis, I will now report more formally whether these visible differences are due to differing models of profits in each region (e.g. differing correlation coefficients) or simply different levels of the determinants selected. The regression result will also allow me to determine more specifically *which* determinants differ and to what degree.

Table 8.2.3

Regression 2a: Determinants of Islamic Bank Performance (ROA and ROE) in the Middle East

ROA				*ROE*			
Variable	Coefficient	Std. Err.	P-value	Variable	Coefficient	Std. Err.	P-value
Equity/ta	0,408	0,218	0,061	Equity/ta	0,739	1,009	0,489
Loans/ta	0,032	0,033	0,320	Loans/ta	0,108	0,160	0,500
Non-interest earning assets/ta	-0,470	0,116	*0,000*	Non-interest earning assets/ta	-1,253	0,569	*0,028*
Customer and short term funding/ta	0,203	0,092	*0,027*	Customer and short term funding/ta	0,330	0,450	0,463
Overhead/ta	0,902	0,916	0,325	Overhead/ta	-1,659	4,499	0,712
Size (total assets)	0,000	0,000	0,245	Size (total assets)	0,000	0,000	*0,027*
Tax/before tax profit	-0,001	0,002	0,587	Tax/before tax profit	-0,018	0,011	0,122
Islamic bank market share	0,017	0,024	0,462	Islamic bank market share	0,145	0,117	0,215
Concentration	0,031	0,023	0,172	Concentration	0,320	0,111	*0,004*
Credit/gdpc	-0,013	0,012	0,284	Credit/gdpc	-0,044	0,059	0,459
Gdp per capita (logged)	0,012	0,011	0,268	Gdp per capita (logged)	-0,012	0,054	0,819
Gdp growth	0,148	0,064	*0,020*	Gdp growth	0,871	0,312	*0,005*
Inflation	-0,179	0,140	0,200	Inflation	-0,106	0,687	0,878
Country risk	-0,006	0,003	*0,032*	Country risk	-0,038	0,014	*0,006*
Oilprice (logged)	0,001	0,005	0,831	Oilprice (logged)	-0,010	0,026	0,706
Equity/ta*gdpc	-0,034	0,024	0,153	Equity/ta*gdpc	-0,082	0,118	0,488
Loans/ta*gdpc	-0,004	0,004	0,268	Loans/ta*gdpc	-0,014	0,020	0,468
Non-interest earning assets/ta*gdpc	0,067	0,014	*0,000*	Non-interest earning assets/ta*gdpc	0,171	0,069	*0,013*
Customer and short term funding/ta*gdpc	-0,024	0,011	*0,025*	Customer and short term funding/ta*gdpc	-0,040	0,053	0,458
Overhead/ta*gdpc	-0,141	0,104	0,173	Overhead/ta*gdpc	0,151	0,508	0,767
Inflation*gdpc	0,028	0,017	0,092	Inflation*gdpc	0,043	0,082	0,598

Note: Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 136 number of groups: 34, observations per group min: 1, observations per group max: 9, observations per group average: 4. The interaction variables are constructed by multiplying the single variable with GDP per capita . Ta= total assets

Table 8.2.4

Regression 2b: Determinants of Islamic Bank Performance (ROA and ROE) in South Asia

ROA				*ROE*			
Variable	Coefficient	Std. Err.	P-value	Variable	Coefficient	Std. Err.	P-value
Equity/ta	*-0,675	0,363	0,063	Equity/ta	-0,392	1,543	0,799
Loans/ta	0,193	0,211	0,360	Loans/ta	*2,483	0,909	*0,006*
Non-interest earning assets/ta	*0,168	0,164	0,304	Non-interest earning assets/ta	-0,491	0,717	0,493
Customer and short term funding/ta	*-0,399	0,316	0,206	Customer and short term funding/ta	*-2,346	1,354	0,083
Overhead/ta	*-2,101	1,460	0,150	Overhead/ta	-12,082	5,006	*0,016*
Size (total assets)	0,000	0,000	0,522	Size (total assets)	0,000	0,000	0,935
Tax/before tax profit	*0,032	0,018	0,071	Tax/before tax profit	*0,238	0,078	*0,002*
Islamic bank market share	-0,051	0,065	0,437	Islamic bank market share	0,563	0,287	*0,050*
Concentration	-0,018	0,025	0,479	Concentration	*-0,372	0,109	*0,001*
Credit/gdpc	-0,021	0,021	0,310	Credit/gdpc	-0,089	0,091	0,667
Gdp per capita (logged)	-0,018	0,035	0,603	Gdp per capita (logged)	-0,177	0,148	0,232
Gdp growth	-0,024	0,248	0,924	Gdp growth	0,580	1,088	0,594
Inflation	*1,357	0,417	*0,001*	Inflation	0,948	1,807	0,600
Country risk	0,003	0,006	0,582	Country risk	-0,009	0,025	0,719
Oilprice (logged)	*-0,033	0,015	*0,023*	Oilprice (logged)	-0,119	0,064	0,061
Equity/ta*gdpc	*0,090	0,053	0,088	Equity/ta*gdpc	0,026	0,226	0,907
Loans/ta*gdpc	-0,021	0,026	0,407	Loans/ta*gdpc	*-0,296	0,111	*0,008*
Non-interest earning assets/ta*gdpc	*-0,019	0,020	0,350	Non-interest earning assets/ta*gdpc	0,054	0,090	0,544
Customer and short term funding/ta*gdpc	*0,046	0,040	0,245	Customer and short term funding/ta*gdpc	*0,291	0,173	0,092
Overhead/ta*gdpc	0,146	0,212	0,472	Overhead/ta*gdpc	1,332	0,631	*0,035*
Inflation*gdpc	*-0,136	0,046	*0,003*	Inflation*gdpc	-0,088	0,198	0,657

Note : Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 71 number of groups: 22, observations per group min: 1, observations per group max: 8, observations per group average: 3 . * = Coefficient defined as significantly different from the coefficient in the Middle Eastern region (see dummy regression appendix G). The interaction variables are constructed by multiplying the single variable with GDP per capita. Ta= total assets

Table 8.2.5

Regression 2c: Determinants of Islamic Bank Performance (ROA and ROE) in North Africa

ROA				*ROE*			
Variable	Coefficient	Std. Err.	P-value	Variable	Coefficient	Std. Err.	P-value
Equity/ta	2,043	0,458	0,000	Equity/ta	*9,476	3,109	0,002
Loans/ta	-0,058	0,070	0,405	Loans/ta	0,299	0,472	0,526
Non-interest earning assets/ta	*1,112	0,297	0,000	Non-interest earning assets/ta	*4,378	2,016	0,030
Customer and short term funding/ta	*1,815	0,361	0,000	Customer and short term funding/ta	*11,566	2,448	0,000
Overhead/ta	-2,555	1,209	0,035	Overhead/ta	-1,011	8,204	0,902
Size (total assets)	0,000	0,000	0,002	Size (total assets)	0,000	0,000	0,339
Tax/before tax profit	0,013	0,005	0,004	Tax/before tax profit	-0,004	0,031	0,893
Islamic bank market share	0,032	0,015	0,040	Islamic bank market share	0,132	0,105	0,208
Concentration	*-0,048	0,015	0,001	Concentration	*-0,332	0,103	0,001
Oilprice (logged)	*0,026	0,006	0,000	Oilprice (logged)	*0,143	0,043	0,001
Credit/gdppc	-0,027	0,018	0,133	Credit/gdppc	-0,311	0,123	0,012
Gdp per capita (logged)	*0,217	0,049	0,000	Gdp per capita (logged)	*1,225	0,335	0,000
Gdp growth	*-0,209	0,084	0,013	Gdp growth	*-0,976	0,569	0,087
Inflation	-0,076	0,394	0,848	Inflation	-0,111	2,672	0,967
Country risk	-0,034	0,016	0,029	Country risk	-0,276	0,106	0,009
Equity/ta *gdppc	*-0,335	0,075	0,000	Equity/ta *gdppc	*-1,648	0,506	0,001
Loans/ta *gdppc	0,010	0,011	0,338	Loans/ta *gdppc	-0,038	0,072	0,594
Non-interest earning assets/ta *gdppc	*-0,184	0,049	0,000	Non-interest earning assets/ta *gdppc	*-0,744	0,335	0,026
Customer and short term funding/ta *gdppc	*-0,300	0,060	0,000	Customer and short term funding/ta *gdppc	*-1,913	0,406	0,000
Overhead/ta *gdppc	0,362	0,203	0,075	Overhead/ta *gdppc	-0,264	1,379	0,848
Inflation*gdppc	0,008	0,062	0,891	Inflation*gdppc	0,014	0,418	0,973

Note: Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 73 number of groups: 13, observations per group min: 1, observations per group max: 9, observations per group average: 6. * = Coefficient defined as significantly different from the coefficient in the Middle Eastern region (see dummy regression appendix G). The interaction variables are constructed by multiplying the single variable with GDP per capita. Ta= total assets

Two regressions for each region have been performed, one for ROA and one for ROE. In addition to this, dummy regressions for ROE and ROA each has been conducted in order to verify whether the visible differences in the separate regression are significantly different from zero between the base case region Middle East and the two other regions. The results are reported in Appendix G. The coefficient of each determinant in the dummy regression represents the Middle East value and by adding this coefficient with each dummy interaction variable's coefficient, it is possible to obtain the two other regions' coefficient values as well. For example the coefficient of concentration in the dummy regression of ROA, 0.031, represents concentration's impact on profits in Middle East and by adding this variable with the coefficient of each of the dummy interaction variables we obtain each region impact of concentration on profitability. For North Africa the coefficient is 0.031 + (-0.079)= - 0.048 and for South Asia: 0.031+ (-0.048)= -0.018, which correspond to the values obtained by the separate regressions.

The equity/ta ratio does only have significant impact on profitability in the North African region, where it has a positive impact on both ROE and ROA. This corresponds to Demirgüc and Huizinga's (2001) findings. The impact is differing significantly from the impact on ROE in the Middle Eastern region for

ROE. South Asia has coefficient significantly different from Middle Eastern region for ROA, but this impact is however not significant on a five percent level. The direction of impact of equity/ta seem to differ between North Africa and South Asia.

Loans to total assets do not have a significant impact on profitability in any of the examined regions, there are neither any significant differences between the base case region, Middle East and North Africa and South Asia. Thus, Islamic bank profits do not seem to differ with the size of bank loans.

Non-interesting earning assets to total assets appear to be an important determinant of profits in both Middle East and North Africa. However in Middle East this impact is negative while in North Africa significantly different and positive. The impact of the non-interest earning assets ratio in Middle East is corresponding to Demirgüc-Kunt and Huizinga's findings on conventional banks as well as Hassan and Bashir (2001) findings on Islamic banks. Further, the interaction variable of non-interest earning assets/ta with GDP is significant in both of these regions. They differ however significantly for this variable as well; in the Middle East there is a positive relation whereas in North Africa a negative relation. This indicates that Middle Eastern countries with high GDP has a higher impact of non-interest earning assets on performance measures whereas in North Africa a high GDP lead to lower impact of the variable on profits. That is a high GDP would in the Middle East strengthen the negative effect of the variable and in North Africa decrease the positive effect. Consequently a high GDP would affect the coefficients of non-interest earning in the same direction in both countries.

North Africa and the Middle East are also significantly differing on the impact of Customer and short term funding on profits. North Africa has significant positive values on both ROA and ROE. Middle East has as well a positive value on this variable but only significant for ROA. South Asia is significantly differing from Middle East as well, but its values are not significant. By looking at the interaction variable of customer and short term funding and GDP, we can conclude that the ratio is affecting profits to a higher degree in countries with low income in the North African region.

As for overhead/ta, its impact seems to be negative across all regions in accordance with expectations. It is however only significant in North Africa (ROA and ROE) and South Asia (ROE). Its impact is defined as not significantly different from Middle East in neither of these cases.

Size in terms of total assets does overall not seem to have an influence on profitability. It only has an impact in the African countries where it has a slightly negative relation to ROA, this impact is however not significantly different from the impact in the Middle East.

The tax ratio impact on ROE is significantly differing between Middle East and South Asia. The results reveal a positive significant relation in South Asia which is contradicting to expectations. In North Africa

as well a positive relationship is found between the tax ratio and ROA; however this relation is not significantly different from that in Middle East. A positive relation between the tax ratio and profitability is consistent with the evidence of Demirgüc-Kunt and Huizinga (2001).The results suggests that banks in environments with high taxation have to earn higher pre-tax profits to pay these taxes.

Islamic bank market share is significantly related to bank profitability in South Asia (ROE) and in North Africa (ROA) but neither is significantly different from the impact in the Middle East. It has a positive impact in both South Asia and North Africa which supports the argument that a higher market share increase the industry's capacity of setting prices.

High concentration of Islamic banks appears to increase ROE in the Middle East. The impact is significantly differing from that in South Asia and North Africa. In these regions there is a significant negative impact of the variable on ROE. In North Africa there is as well a significant negative impact on ROA. It seems that in South Asia and North Africa a high concentration does not increase the banks' ability as price setters.

Credit to GDP has been used an indicator of bank development and in line with Demirgüc-Kunt and Huizinga's (2001) findings it is expected to be negatively correlated to profitability. By observing graphs over ROE and ROA over the sample time period we can also tell that South Asia who is having the most developed banking system is having the lowest profit, which seemingly supports the theory. For the other regions the results is contradictory to the theory. By looking at the regression results we observe that credit only is significantly affecting profits in North Africa and the impact is, in line with expectations, negative. This indicates that the more developed a North African country's bank system is, the lower is its bank profits. The result is not significantly different from the impact in the Middle Eastern region. It thus seems as the reason for the differences in ROA and ROE within Islamic banking mostly can be explained by other variables than bank development.

Country risk is having a significant negative relation to ROA and ROE in the Middle East and North Africa. The impact does not significantly differ between the regions. In the South Asian region country risk does not impact returns. These results do not correspond to economic theory that higher systematic risks should lead to higher rate of returns in a country. This might be caused by a sub-optimal choice of proxy of systematic risk.

Inflation has a significantly different impact on ROA in South Asia compared to the Middle East where the ratio is non-significant. It is in the South Asian region significant and positive corresponding to expectations and Bashir's (2003) findings.

For the interaction variables between GDP per capita and bank-level variables the most significant coefficients are to be found in North Africa. This indicates that the impact of the bank variables on profits in these regions is depending on the income level in the country. The signs for the significant interaction variables in the North African region are negative, and this in combination with that the single corresponding bank-variables is having positive signs indicate that GDP in general lower the impact of the variable on the profitability. When looking only at the GDP variable we observe a positive and significant effect. These two results combined indicate that high income countries in the North African region tend to have higher bank profits and a general lower impact of the bank variables on profitability than in low income countries. Thus, the level of the bank ratios is of less importance to bank profits in low income countries. The change in GDP, GDP growth is however negatively related to profits in the North African region. So thus while the *level* of economic development has a positive impact on North African banks, the *shifts* in the economy has negative impact. This can be explained as follows: A high income country has in general higher profits, but a country that experience a momentarily increase in income will due to this change see its bank profits decline. GDP per capita does not have any significant impact in any other region. GDP growth in the Middle East is significantly differing from the variable in North Africa and it is significant but positive. The relation observed in the Middle East is in line with expectations, since profitability is expected to decline in times of recession. The results are also corresponding to Hassan and Bashir's (2003) findings.

Oil price is, contradicting to Essayyad et al's (2003) findings, not a determinant to profitability in the Middle East. It is however impacting ROA in South Asia and both ROA and ROE in North Africa. It is also significantly different from the Middle East for both regions. In North Africa the influence is positive, bank revenues seem to increase during times of high oil price. In South Asia, the results indicate a negative impact of oil price on ROA. On a 10 percent level it has a significant negative impact on ROE as well. Since most countries in South Asia are net oil importers this negative relation appears logical. The positive relation in North Africa might be explained by the fact that the dominant Islamic bank sector in this region is Sudan who is largely depending on its oil exports.

The findings of the regressions including Market capitalization to GDP as a proxy for stock market size can be found in Appendix H. The ratio has a significant and positive impact on ROE in the Middle East. The results are consistent with the evidence of Dermirgüc-Kunt and Huizinga (2001). The ratio does not have an impact on ROA in the Middle East and neither of the performance measures in South Asia. As described previously, the variable's impact in the North African countries cannot be assessed due to insufficient number of observations.

9. Discussion

When investigating the determinants of profitability in general across the sample, few variables are seen significant. When verifying the level of profits in each region the patterns in the graphs reveal that the regions are clearly differing in their bank profitability. However, without further analysis I still cannot determine whether these differences are due to different levels of the explanatory factors (e.g. different bank development between the regions) or a different impact of the explanatory variables (a different level of the correlation coefficients). I therefore subsequently allow for regional differences and the findings reveal a higher number of significant variables than in the world-wide level regression. The variables do also seem to differ extensively between countries. There is thus evidence that the differences in profitability is not only a caused by different level of the explanatory variables but also by different profit functions across regions. The significant differences in impacts between regions might have contributed to the lack of significant variables in the overall worldwide region. A variable that in one region has a significant positive impact on profits might have the opposite effect in another region and the risk is that the impacts offset each other. This might result in p-values that falsely lead the reader in to believing that the variable is not determining profitability, when in fact it does, but differently in different regions. One also has to take into account the relatively large number of explanatory variables might lead to seemingly "significant" relationships that are in fact spurious. To obtain an overall picture of the Islamic bank sector it is of value to perform a non-region specific regression analysis. But to obtain a more profound understanding of the determinants of Islamic bank profitability it is of importance to regionalize the analysis.

10. Conclusion

There has been done research on conventional as well as Islamic bank profitability; worldwide studies as well as regional studies but no study to my awareness that formally *compare* regions. Previously, mostly Islamic banking in Middle East has been given attention while this paper also shed light on the two other Islamic bank markets; North Africa and South Asia.

The overall regression of Islamic bank profitability indicates that these banks responds positively to increases in GDP growth but negatively to equity/ta, non interest-earning assets/ta, credit/GDP and GDP per capita.

The data reveal differences in profit ratios between regions. Middle Eastern Islamic banks appear to have the highest profitability while for South Asia the lowest profitability is reported. For the region-specific regressions I obtain results that differ from the world-wide regression. The determinants as well as their specific impact are varying between regions. The impact of loans/ta and overhead/ta on profitability appear similar across regions. The first seem to have no impact on performance in all regions whereas a higher overhead/ta lowers profits. The effect of equity/ta, non-interest earning assets/ta and customer and short term funding/ta on profits seem to be different between regions. For equity/ta there seems to be differences firstly between Middle East and North Africa and secondly between North Africa and South Asia. Non-interest earning assets/ta's effect on profitability seem to in particular differ between North Africa and Middle East where it has a positive impact in the first region and a negative relation in the latter. Customer and short-term funding increases profitability in Middle East and North Africa but the impact is only significant in the latter. Bank size does not appear to impact profitability in any region. The tax ratio seems to in general have a positive, but not always significant impact and it appears as South Asia is differing significantly from Middle East and North Africa. The effect of the interaction variables are significantly differing between regions. The findings indicate that a higher GDP level in general lead to a weakened effect of the variables it has been interacted with on profitability in North Africa. However, in the other regions where relations are found significant the relation is found positive and a high GDP level thus leads to a strengthened effect of the variables it has been interacted with on profitability.

As for the financial structure variables, Islamic bank market share does not appear to impact profitability in any region. The impact of Islamic bank concentration differs significantly between the base case region and the two other regions. A higher concentration increases bank profits in the Middle East and lowers them in North Africa and South Asia.

As for macro indicators, credit/GDP, inflation and country risk seem to all impact profitability in a similar direction across all regions. The credit ratio has a negative relation to profitability across all regions

corresponding to the findings of Demirgüc-Kunt and Huizinga (2001). However, the variable is only significant in North Africa. The variable's impact on profits is furthermore not found significantly differing between regions. Inflation does not determine profitability according to my findings. Country risk has a significant and negative impact across the three regressions. GDP per capita and GDP growth affects profits significantly different between North Africa and the two other regions. In North Africa the impact of the growth is negative for profits and the impact of the level of GDP positive. GDP per capita does not influence profit level in South Asia and Middle East while GDP growth does and in a positive direction.

The impact of oil price is significantly differing between regions. In the Middle East is has no impact on bank profits, in North Africa a higher oil price increases profits and in South Asia the reverse relation is found.

11. Future research

This study had the ambition to do an initial investigation of the mechanisms of profitability within Islamic banking across its main regions. This research could be extended by adding new variables and by narrowing down the focus to a country specific level. There are also other areas within Islamic banking in general that could be subject to future research.

The relative stability of Islamic banking institutions in current recession has gained attention internationally. Performance studies comparing Islamic bank profitability to that of conventional banks in the financial crisis 2007-2008 would be a suggestion for further research attempts in the area.

Islamic banks' investment policies and instruments are differing from conventional banks and to study these differences in further detail could be an interesting starting point for future research. This approach could also be combined with the approach of Islamic bank stability during crisis, since it is often argued that the resistance towards crisis is due to the specific Islamic bank investment policies.

A third area of interest could be the spreading of Islamic banks to non-Muslim countries such as the US, UK etc. To determine the factors that impact profitability in these markets compared to the markets examined in this study could be an interesting complement to this study.

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13. Appendix

A. Explanatory variables

A.1 Bank Variables:

Eqta= Equity/total assets. This ratio measures the ability of the bank to withstand losses.

Loanta= Loans /total assets

Nieata= Non-interest earning assets(e.g. cash, real estate)/total assets

Cstfta= Customer & short term funding (deposits etc)/ total assets

Ovrhdta= overhead/ total assets

Asst= Total assets per bank. Indicator of bank size.

Tax= tax /profit before tax

A.2. Macroeconomic Indicators:

Gdppc= GDP per capita (constant 2000 USD)

GDP growth= Growth in GDP (annual percent)

Inflation=inflation (GDP deflator)

Market capitalization= Market capitalization/GDP.

Islamic bank market share= Islamic banks total asset/tot banks tot assets

Country risk= measures the country credit risk, i.e. the likelihood that a country will service its external debt. Country risk values are retrieved from OECD. If different values the same year an average has been estimated.

A.3 Financial structure variable

Concentration = Tot assets of three largest Islamic banks in a country/tot assets of all Islamic banks in that country.

Credit= Credit to the private sector by deposit money banks/GDP. Measures the credit activity of the banking system.

A.4 Global variables:

Oil price= Inflation adjusted oil price

B. Geographical distribution of Islamic banks

North Africa:
Egypt
Gambia
Mauretania
Sudan
Tunisia

Middle East:
Bahrain
Iran
Jordan
Lebanon
Qatar
Saudi Arabia
Bahrain
Yemen

South Asia:
Bangladesh
Brunei Darussalam
Indonesia
Malaysia
Pakistan

C. Mean values of bank-level variables, macro indicators and financial structure variables

Region	Country	ROA	ROE	Customer and short term funding/ta	Loans/ta	Overhead/ta	Tax/before tax profit	Equity/ta	Non-interest earning funding/ta
Africa	Egypt	0.003	0.070	0.912	0.685	0.010	0.019	0.051	0.036
Africa	Gambia	-0.008	*0.145*	0.520	0.399	0.087	*-1.112*	0.074	0.273
Africa	Mauretania	0.018	0.055	0.560	0.576	0.058	0.210	0.266	0.159
Africa	Sudan	0.018	0.113	0.562	0.279	0.054	0.171	0.170	0.295
Africa	Tunisia	0.016	0.064	0.723	0.520	0.013	0.004	0.275	0.023
Asia	Bangladesh	0.003	*0.320*	1.018	0.767	0.031	*0.088*	-0.089	0.138
Asia	Brunei	0.016	*0.114*	0.829	0.617	0.015	*0.970*	0.104	0.195
Asia	Indonesia	0.018	0.091	0.843	0.728	0.039	1.669	0.222	0.087
Asia	Malaysia	0.001	*0.021*	0.904	0.525	0.017	*2.201*	0.137	0.135
Asia	Pakistan	0.014	0.067	0.829	0.542	0.044	0.005	0.357	0.163
ME	Bahrain	0.063	0.130	0.810	0.473	0.034	-0.698	0.477	0.133
ME	Iran	0.013	0.154	0.684	0.674	0.022	1.347	0.066	0.063
ME	Jordan	0.011	*0.076*	0.849	0.400	0.014	*0.022*	0.109	0.217
ME	Kuwait	0.070	*0.196*	0.936	0.624	0.031	*0.379*	0.422	0.098
ME	Lebanon	0.007	-0.012	0.292	0.132	0.064	0.000	0.532	0.177
ME	Qatar	0.039	*0.234*	0.709	0.597	0.017	*0.000*	0.189	0.049
ME	Saudi Arabia	0.025	0.099	1.063	0.876	0.021	0.000	0.596	0.111
ME	UAE	0.027	0.130	0.812	0.619	0.015	0.000	0.215	0.070
ME	Yemen	0.010	0.094	0.878	0.473	0.014	0.341	0.114	0.209

Table I. Bank level variables

Region	Country	Gdp/capita	Gdp growth	Inflation	Islamic bank market share	Country risk
Africa	Egypt	1588.298	0.048	0.061636	0.024422509	4.000
Africa	Gambia	313.027	*0.049*	0.101979	0.060555409	7.000
Africa	Mauretania	438.556	0.041	0.055212	0.148266368	7.000
Africa	Sudan	424.219	0.070	0.09491	0.212163207	6.951
Africa	Tunisia	2262.733	0.050	0.028181	0.016254793	3.444
Asia	Bangladesh	378.653	*0.057*	0.040906	0.009828991	5.235
Asia	Brunei	18093.348	*0.023*	0.095701	0.455087426	1.647
Asia	Indonesia	885.629	0.046	0.1208	0.002631297	5.711
Asia	Malaysia	4332.232	*0.057*	0.037118	0.013894788	2.111
Asia	Pakistan	571.997	0.050	0.087467	0.006171915	6.600
ME	Bahrain	13130.155	0.057	0.058844	0.092821747	2.867
ME	Iran	1798.076	0.054	0.198335	0.446452009	4.622
ME	Jordan	1960.704	*0.056*	0.022753	0.043988102	5.578
ME	Kuwait	19170.647	*0.067*	0.111225	0.09462267	2.277
ME	Lebanon	4829.456	0.028	0.016048	0.000643703	6.356
ME	Qatar	29766.128	*0.082*	0.107604	0.147077436	2.933
ME	Saudi Arabia	9425.715	0.038	0.075109	0.05923479	2.756
ME	UAE	22347.677	0.065	0.095625	0.102109283	2.000
ME	Yemen	535.174	0.039	0.160358	0.117368508	6.289

Table II. Macro variables

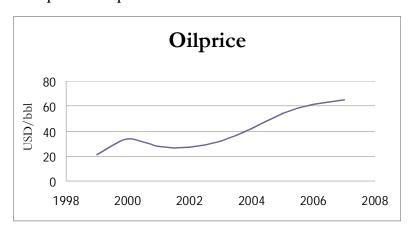| Region	Country	Credit/gdp	Concentration	Assets(th USD)
Africa	Egypt	0.585	0.990	1815393
Africa	Gambia	0.198	*1.000*	11967
Africa	Mauretania	0.227	1.000	76383
Africa	Sudan	0.067	0.733	172432
Africa	Tunisia	0.659	1.000	236711
Asia	Bahrain	0.618	*0.768*	994481
Asia	Bangladesh	0.311	*1.000*	259338
Asia	Brunei	0.467	1.000	1597509
Asia	Indonesia	0.231	*1.000*	593896
Asia	Malaysia	1.454	0.884	2231086
Asia	Pakistan	0.257	0.932	167966
ME	Iran	0.368	0.714	14403247
ME	Jordan	0.816	*1.000*	1031908
ME	Kuwait	0.609	*0.948*	2914319
ME	Lebanon	0.798	1.000	62960
ME	Qatar	0.326	*0.964*	1634261
ME	Saudi Arabia	0.506	1.000	9471738
ME	UAE	0.542	0.941	4099008
ME	Yemen	0.065	0.971	255567

Table III. Financial structure variables

D. Test for autocorrelation

Regression	The lowest significance where the null hypothesis can be rejected
1.a. All regions:ROA	0.012
1.b. All regions:ROE	0.001
2.a. ME: ROA	0.000
2.b. ME: ROE	0.000
2.c.South Asia:ROA	0.000
2.d. South Asia:ROE	0.307
2.e. North Africa:ROA	0.003
2.f. North Africa:ROE	0.003
3.a. Dummyregression: ROA	0.000
3.b. Dummyregression: ROE	0.000

Table IV. Wooldridge test for autocorrelation in panel data, H0: No first-order autocorrelation

E. Oil price development 1999-2007

F. Model 2 extended: Regression including market capitalization

Table V and VI

Determinants of Islamic Bank Profitability (ROA and ROE) including market cap in the Middle East

ROA				ROE			
Variable	Coefficient	Std. Err.	P-value	Variable	Coefficient	Std. Err.	P-value
Equity/ta	-0,928	0,411	0,024	Equity/ta	0,292	1,979	0,883
Loans/ta	0,264	0,243	0,277	Loans/ta	3,194	1,128	0,005
Non-interest earning assets/ta	0,308	0,198	0,121	Non-interest earning assets/ta	-0,185	0,895	0,836
Customer and short term funding/ta	-0,585	0,322	0,069	Customer and short term funding/ta	-2,458	1,498	0,101
Overhead/ta	0,742	2,437	0,761	Overhead/ta	-12,193	6,123	0,046
Size (total assets)	0,000	0,000	0,274	Size (total assets)	0,000	0,000	0,985
Tax/before tax profit	0,038	0,019	0,045	Tax/before tax profit	0,272	0,089	0,002
Islamic bank market share	2,401	0,805	0,003	Islamic bank market share	-0,019	3,746	0,996
Concentration	0,142	0,050	0,005	Concentration	-0,283	0,237	0,232
Credit/gdppc	-0,091	0,030	0,003	Credit/gdppc	-0,135	0,140	0,336
Market capitalization	0,007	0,036	0,848	**Market capitalization**	0,189	0,172	0,270
Gdp per capita (logged)	0,002	0,040	0,961	Gdp per capita (logged)	-0,180	0,185	0,333
Gdp growth	0,352	0,396	0,374	Gdp growth	1,590	1,851	0,390
Inflation	2,811	1,178	0,017	Inflation	3,072	5,528	0,578
Country risk	-0,001	0,007	0,856	Country risk	-0,019	0,031	0,535
Oilprice (logged)	-0,050	0,019	0,009	Oilprice (logged)	-0,148	0,090	0,100
Equity/ta *gdppc	0,129	0,061	0,034	Equity/ta *gdppc	-0,079	0,293	0,787
Loans/ta *gdppc	-0,029	0,030	0,327	Loans/ta *gdppc	-0,388	0,139	0,005
Non-interest earning assets/ta *gdppc	-0,034	0,025	0,171	Non-interest earning assets/ta *gdppc	0,011	0,112	0,919
Customer and short term funding/ta *gdppc	0,070	0,041	0,086	Customer and short term funding/ta *gdppc	0,294	0,190	0,122
Overhead/ta *gdppc	-0,276	0,356	0,438	Overhead/ta *gdppc	1,382	0,809	0,087
Inflation*gdppc	-0,374	0,176	0,034	Inflation*gdppc	-0,427	0,826	0,606

Note: Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 117 number of groups: 30, observations per group min: 1, observations per group max: 9, observations per group average: 4.

Table VII and VIII

Determinants of Islamic Bank Performance (ROA and ROE) including market cap in South Asia

ROA				ROE			
Variable	Coefficient	Std. Err.	P-value	Variable	Coefficient	Std. Err.	P-value
Equity/ta	-0,928	0,411	0,024	Equity/ta	0,292	1,979	0,883
Loans/ta	0,264	0,243	0,277	Loans/ta	3,194	1,128	0,005
Non-interest earning assets/ta	0,308	0,198	0,121	Non-interest earning assets/ta	-0,185	0,895	0,836
Customer and short term funding/ta	-0,585	0,322	0,069	Customer and short term funding/ta	-2,458	1,498	0,101
Overhead/ta	0,742	2,437	0,761	Overhead/ta	-12,193	6,123	0,046
Size (total assets)	0,000	0,000	0,274	Size (total assets)	0,000	0,000	0,985
Tax/before tax profit	0,038	0,019	0,045	Tax/before tax profit	0,272	0,089	0,002
Islamic bank market share	2,401	0,805	0,003	Islamic bank market share	-0,019	3,746	0,996
Concentration	0,142	0,050	0,005	Concentration	-0,283	0,237	0,232
Credit/gdppc	-0,091	0,030	0,003	Credit/gdppc	-0,135	0,140	0,336
Market capitalization	0,007	0,036	0,848	**Market capitalization**	0,189	0,172	0,270
Gdp per capita (logged)	0,002	0,040	0,961	Gdp per capita (logged)	-0,180	0,185	0,333
Gdp growth	0,352	0,396	0,374	Gdp growth	1,590	1,851	0,390
Inflation	2,811	1,178	0,017	Inflation	3,072	5,528	0,578
Country risk	-0,001	0,007	0,856	Country risk	-0,019	0,031	0,535
Oilprice (logged)	-0,050	0,019	0,009	Oilprice (logged)	-0,148	0,090	0,100
Equity/ta *gdppc	0,129	0,061	0,034	Equity/ta *gdppc	-0,079	0,293	0,787
Loans/ta *gdppc	-0,029	0,030	0,327	Loans/ta *gdppc	-0,388	0,139	0,005
Non-interest earning assets/ta *gdppc	-0,034	0,025	0,171	Non-interest earning assets/ta *gdppc	0,011	0,112	0,919
Customer and short term funding/ta *gdppc	0,070	0,041	0,086	Customer and short term funding/ta *gdppc	0,294	0,190	0,122
Overhead/ta *gdppc	-0,276	0,356	0,438	Overhead/ta *gdppc	1,382	0,809	0,087
Inflation*gdppc	-0,374	0,176	0,034	Inflation*gdppc	-0,427	0,826	0,606

Note: Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 62 number of groups: 20, observations per group min: 1, observations per group max: 8, observations per group average: 3.

G. Model 3: Dummy regression to determine significance of differences between regions

Table IX and X: Determinants of Islamic Bank Performance (ROA and ROE), dummy regression

ROA				ROE			
Variable	Coefficient	Std. Err.	P-value	Variable	Coefficient	Std. Err.	P-value
dAFR	-0,959	0,602	0,111	dAFR	-5,282	2,925	0,071
dASIA	0,416	0,236	0,078	dASIA	2,137	1,124	0,057
equity/ta	0,408	0,215	0,057	equity/ta	0,739	1,044	0,479
dAFR*equity/ta	1,635	0,885	0,065	dAFR*equity/ta	8,737	4,303	0,042
dASIA*equity/ta	-1,083	0,353	0,002	dASIA*equity/ta	-1,131	1,683	0,502
loans/ta	0,032	0,032	0,313	loans/ta	0,108	0,157	0,490
dAFR*loans/ta	-0,090	0,134	0,501	dAFR*loans/ta	0,191	0,653	0,769
dASIA*loans/ta	0,161	0,166	0,333	dASIA*loans/ta	2,375	0,793	0,003
Non-interest earning assets/ta	-0,470	0,114	0,000	Non-interest earning assets/ta	-1,253	0,556	0,024
dAFR*Non-interest earning assets/ta	1,583	0,569	0,005	dAFR*Non-interest earning assets/ta	5,631	2,763	0,042
dASIA*Non-interest earning assets/ta	0,639	0,170	0,000	dASIA*Non-interest earning assets/ta	0,762	0,828	0,358
Customer and short-term funding/ta	0,203	0,090	0,025	Customer and short-term funding/ta	0,330	0,439	0,453
dAFR*Customer and short-term funding/ta	1,613	0,682	0,018	dAFR*Customer and short-term funding/ta	11,236	3,317	0,001
dASIA*Customer and short-term funding/ta	-0,602	0,260	0,020	dASIA*Customer and short-term funding/ta	-2,676	1,239	0,031
Overhead/ta	0,902	0,904	0,318	Overhead/ta	-1,659	4,393	0,706
dAFR*Overhead/ta	-3,457	2,440	0,157	dAFR*Overhead/ta	0,648	11,859	0,956
dASIA*Overhead/ta	-3,004	1,444	0,037	dASIA*Overhead/ta	-10,423	6,137	0,089
Size (ta)	0,000	0,000	0,238	Size (ta)	0,000	0,000	0,024
dAFR*size (ta)	0,000	0,000	0,087	dAFR*Size (ta)	0,000	0,000	0,423
dASIA*size (ta)	0,000	0,000	0,473	dASIA*Size (ta)	0,000	0,000	0,759
Tax/before tax profit	-0,001	0,002	0,582	Tax/before tax profit	-0,018	0,011	0,114
dAFR*Tax/before tax profit	0,014	0,009	0,107	dAFR*Tax/before tax profit	0,014	0,043	0,752
dASIA*Tax/before tax profit	0,034	0,014	0,016	dASIA*Tax/before tax profit	0,256	0,068	0,000
Islamic bank market share	0,017	0,023	0,456	Islamic bank market share	0,145	0,114	0,205
dAFR*Islamic bank market share	0,014	0,037	0,704	dAFR*Islamic bank market share	-0,013	0,181	0,943
dASIA*Islamic bank market share	-0,068	0,056	0,219	dASIA*Islamic bank market share	0,418	0,271	0,123
Concentration	0,031	0,022	0,167	Concentration	0,320	0,108	0,003
dAFR*Concentration	-0,079	0,036	0,028	dAFR*Concentration	-0,652	0,175	0,000
dASIA*concentration	-0,048	0,029	0,100	dASIA*concentration	-0,693	0,143	0,000
Credit/gdppc	-0,013	0,012	0,278	Credit/gdppc	-0,044	0,057	0,448
dAFR*Credit/gdppc	-0,014	0,036	0,688	dAFR*Credit/gdppc	-0,267	0,175	0,126
dASIA*Credit/gdppc	-0,008	0,020	0,680	dASIA*Credit/gdppc	0,005	0,096	0,962
gdppc per capita (logged)	0,012	0,011	0,262	gdppc per capita (logged)	-0,012	0,053	0,814
dAFR*gdppc per capita (logged)	0,205	0,093	0,028	dAFR*gdppc per capita (logged)	1,237	0,453	0,006
dASIA* gdppc per capita (logged)	-0,030	0,029	0,296	dASIA* gdppc per capita (logged)	-0,165	0,138	0,231
gdppc growth	0,148	0,063	0,018	gdppc growth	0,871	0,305	0,004
dAFR*gdppc growth	-0,357	0,169	0,035	dAFR*gdppc growth	-1,847	0,823	0,025
dASIA*gdppc growth	-0,172	0,201	0,394	dASIA*gdppc growth	-0,291	0,980	0,767
Inflation	-0,179	0,138	0,194	Inflation	-0,106	0,671	0,875
dAFR*Inflation	0,103	0,751	0,890	dAFR*Inflation	-0,005	3,650	0,999
dASIA*Inflation	1,537	0,350	0,000	dASIA*Inflation	1,054	1,686	0,532
Country risk	-0,006	0,003	0,029	Country risk	-0,038	0,014	0,005
dAFR*country risk	-0,028	0,029	0,340	dAFR*country risk	-0,238	0,143	0,097
dASIA*country risk	0,009	0,005	0,077	dASIA*country risk	0,029	0,026	0,251
Oil price (logged)	0,001	0,005	0,829	Oil price (logged)	-0,010	0,025	0,699
dAFR*Oil price (logged)	0,025	0,013	0,051	dAFR*Oil price (logged)	0,153	0,063	0,015
dASIA*Oil price (logged)	-0,034	0,012	0,006	dASIA*Oil price (logged)	-0,110	0,060	0,067
equity/ta*gdppc	-0,034	0,024	0,148	equity/ta*gdppc	-0,082	0,116	0,477
dAFR*equity/ta*gdppc	-0,301	0,142	0,034	dAFR*equity/ta*gdppc	-1,565	0,690	0,023
dASIA*equity/ta*gdppc	0,125	0,047	0,008	dASIA*equity/ta*gdppc	0,109	0,225	0,630
loans/ta*gdppc	-0,004	0,004	0,261	loans/ta*gdppc	-0,014	0,019	0,458
dAFR*loans/ta *gdppc	0,015	0,020	0,471	dAFR*loans/ta *gdppc	-0,024	0,098	0,807
dASIA*loans/ta *gdppc	-0,017	0,020	0,404	dASIA*loans/ta *gdppc	-0,282	0,097	0,004
Non-interest earning assets/ta*gdppc	0,067	0,014	0,000	Non-interest earning assets/ta*gdppc	0,171	0,068	0,011
dAFR*Non-interest earning assets/ta*gdppc	-0,251	0,093	0,007	dAFR*Non-interest earning assets/ta*gdppc	-0,916	0,454	0,044
dASIA*Non-interest earning assets/ta *gdppc	-0,086	0,021	0,000	dASIA*Non-interest earning assets/ta *gdppc	-0,117	0,102	0,252
Customer and short-term funding/ta*gdppc	-0,024	0,011	0,023	Customer and short-term funding/ta*gdppc	-0,040	0,052	0,447
dAFR*Customer and short-term funding/ta *gdppc	-0,276	0,113	0,014	dAFR*Customer and short-term funding/ta *gdppc	-1,874	0,548	0,001
dASIA*Customer and short-term funding/ta *gdppc	0,071	0,033	0,030	dASIA*Customer and short-term funding/ta *gdppc	0,332	0,157	0,035
Overhead/ta*gdppc	-0,141	0,102	0,167	Overhead/ta*gdppc	0,151	0,496	0,762
dAFR*Overhead/ta *gdppc	0,503	0,394	0,202	dAFR*Overhead/ta *gdppc	-0,414	1,916	0,829
dASIA*Overhead/ta *gdppc	0,287	0,187	0,125	dASIA*Overhead/ta *gdppc	1,181	0,734	0,107
Inflation*gdppc	0,028	0,017	0,088	Inflation*gdppc	0,043	0,080	0,589
dAFR*Inflation*gdppc	-0,020	0,117	0,865	dAFR*Inflation*gdppc	-0,029	0,567	0,959
dASIA*Inflation*gdppc	-0,165	0,039	0,000	dASIA*Inflation*gdppc	-0,131	0,187	0,484

Note: Estimation technique: Feasible Generalized Least Squares (FGLS). Number of observations: 280 number of groups: 69, observations per group min: 1, observations per group max: 9, observations per group average: 4.

H. List of Islamic banks in sample

Country	Region	Name of bank
Bahrain	Middle East	ALBARAKA BANKING GROUP BSC
Bahrain	Middle East	GULF FINANCE HOUSE BSC
Bahrain	Middle East	SHAMIL BANK OF BAHRAIN BSC
Bahrain	Middle East	KUWAIT FINANCE HOUSE
Bahrain	Middle East	BAHRAIN ISLAMIC BANK BSC
Bahrain	Middle East	ABC ISLAMIC BANK (EC)
Bahrain	Middle East	AL-SALAM BANK-BAHRAIN BSC
Bahrain	Middle East	ALBARAKA ISLAMIC BANK BSC
Bahrain	Middle East	KHALEEJI COMMERCIAL BANK
Bahrain	Middle East	UNICORN INVESTMENT BANK BSC
Bahrain	Middle East	UNITED INTERNATIONAL BANK BSC
Bahrain	Middle East	CAPIVEST
Bahrain	Middle East	INTERNATIONAL INVESTMENT BANK BSC
Bahrain	Middle East	VENTURE CAPITAL BANK BSC (C)
Bahrain	Middle East	INVESTORS BANK BSC
Bahrain	Middle East	CITI ISLAMIC INVESTMENT BANK
Bahrain	Middle East	ARAB ISLAMIC BANK EC
Bahrain	Middle East	ISLAMIC INVESTMENT COMPANY OF THE GULF (BAHRAIN)
Bahrain	Middle East	AL AMIN BANK
Bahrain	Middle East	ARCAPITA BANK BSC
Iran	Middle East	BANK SADERAT IRAN
Iran	Middle East	BANK SEPAH
Iran	Middle East	BANK MASKAN
Iran	Middle East	BANK KESHAVARZI
Iran	Middle East	BANK TEJARAT
Iran	Middle East	BANK MELLAT
Jordan	Middle East	JORDAN ISLAMIC BANK FOR FINANCE AND INVESTMENT
Jordan	Middle East	ISLAMIC INTERNATIONAL ARAB BANK
Kuwait	Middle East	KUWAIT FINANCE HOUSE
Kuwait	Middle East	INVESTMENT DAR CO (THE)
Kuwait	Middle East	KUWAIT INTERNATIONAL BANK
Kuwait	Middle East	A'AYAN LEASING & INVESTMENT COMPANY
Kuwait	Middle East	AREF INVESTMENT GROUP
Kuwait	Middle East	FIRST INVESTMENT COMPANY KSCC
Kuwait	Middle East	INTERNATIONAL INVESTOR COMPANY, KSC (THE)
Lebanon	Middle East	ARAB FINANCE HOUSE HOLDING SAL
Lebanon	Middle East	AL BARAKA BANK LEBANON SAL
Qatar	Middle East	QATAR ISLAMIC BANK SAQ
Qatar	Middle East	MASRAF AL RAYAN (QSC)
Qatar	Middle East	QATAR INTERNATIONAL ISLAMIC BANK
Qatar	Middle East	QINVEST LLC
Qatar	Middle East	FIRST FINANCE COMPANY (QSC)

Saudi Arabia	Middle East	AL RAJHI BANKING & INVESTMENT CORPORATION
Saudi Arabia	Middle East	ISLAMIC DEVELOPMENT BANK
Saudi Arabia	Middle East	BANK ALBILAD
United Arab Emirates	Middle East	DUBAI ISLAMIC BANK PLC
United Arab Emirates	Middle East	ABU DHABI ISLAMIC BANK - PUBLIC JOINT STOCK CO
United Arab Emirates	Middle East	EMIRATES ISLAMIC BANK PJSC
United Arab Emirates	Middle East	DUBAI BANK
United Arab Emirates	Middle East	SHARJAH ISLAMIC BANK
United Arab Emirates	Middle East	AMLAK FINANCE PJSC
United Arab Emirates	Middle East	TAMWEEL PJSC
United Arab Emirates	Middle East	NOOR ISLAMIC BANK
Yemen	Middle East	TADHAMON INTERNATIONAL ISLAMIC BANK
Yemen	Middle East	SABA ISLAMIC BANK
Yemen	Middle East	SHAMIL BANK OF YEMEN & BAHRAIN
Yemen	Middle East	ISLAMIC BANK OF YEMEN FOR FINANCE & INVESTMENT
Egypt	North Africa	FAISAL ISLAMIC BANK OF EGYPT
Egypt	North Africa	EGYPTIAN SAUDI FINANCE BANK
Egypt	North Africa	ISLAMIC INTERNATIONAL BANK FOR INVESTMENT & DEVELOPMENT
Gambia	North Africa	ARAB GAMBIAN ISLAMIC BANK
Mauritania	North Africa	BANQUE AL WAVA MAURITANIENNE ISLAMIQUE
Sudan	North Africa	BANK OF KHARTOUM
Sudan	North Africa	FAISAL ISLAMIC BANK (SUDAN)
Sudan	North Africa	TADAMON ISLAMIC BANK
Sudan	North Africa	ISLAMIC CO-OPERATIVE DEVELOPMENT BANK
Sudan	North Africa	AL BARAKA BANK SUDAN
Sudan	North Africa	INDUSTRIAL DEVELOPMENT BANK
Sudan	North Africa	UNITED CAPITAL BANK
Sudan	North Africa	AL SHAMAL ISLAMIC BANK
Sudan	North Africa	SUDANESE ISLAMIC BANK
Tunisia	North Africa	BANK ETTAMOUIL SAOUDI TOUNSI - BEST BANK
Bangladesh	South Asia	SHAHJALAL ISLAMI BANK LTD
Bangladesh	South Asia	ICB ISLAMIC BANK LIMITED
Brunei Darussalam	South Asia	BANK ISLAM BRUNEI DARUSSALAM BERHAD
Brunei Darussalam	South Asia	ISLAMIC BANK OF BRUNEI BHD
Indonesia	South Asia	BANK SYARIAH MANDIRI
Malaysia	South Asia	BANK ISLAM MALAYSIA BERHAD
Malaysia	South Asia	BANK MUAMALAT MALAYSIA BERHAD
Malaysia	South Asia	AMISLAMIC BANK BERHAD
Malaysia	South Asia	CIMB ISLAMIC BANK BERHAD
Malaysia	South Asia	RHB ISLAMIC BANK BERHAD
Malaysia	South Asia	AFFIN ISLAMIC BANK BERHAD
Malaysia	South Asia	EONCAP ISLAMIC BANK BERHAD

Malaysia	South Asia	HONG LEONG ISLAMIC BANK BERHAD
Malaysia	South Asia	AL RAJHI BANKING & INVESTMENT CORPORATION (MALAYSIA) BERHAD
Malaysia	South Asia	ASIAN FINANCE BANK BERHAD
Malaysia	South Asia	PUBLIC ISLAMIC BANK BERHAD
Pakistan	South Asia	MEEZAN BANK LIMITED
Pakistan	South Asia	ALBARAKA ISLAMIC BANK BSC (EC) - PAKISTAN BRANCHES
Pakistan	South Asia	DUBAI ISLAMIC BANK PAKISTAN LIMITED
Pakistan	South Asia	BANKISLAMI PAKISTAN LIMITED
Pakistan	South Asia	EMIRATES GLOBAL ISLAMIC BANK LIMITED
Pakistan	South Asia	DAWOOD ISLAMIC BANK
Pakistan	South Asia	FIRST HABIB MODARABA
Pakistan	South Asia	STANDARD CHARTERED MODARABA
Pakistan	South Asia	FIRST NATIONAL BANK MODARABA