OIL PRICE MOVEMENT AND BANK PERFORMANCE IN THE MIDDLE EASTERN OIL EXPORTING COUNTRIES

Submitted in fulfilment of the requirement for the degree of Doctor of Philosophy

BY

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ABSTRACT

Banks as the most evident financial institutions which provide a range of financial services in their primary role as intermediary from lenders and borrowers of money to sophisticated tools concerned with credit and liquidity provision, risk management and remittance of funds play a vital role in the economy of countries. Measuring the performance of banks, and identifying the factors which impact it, is an issue of major interest for regulators, policy makers, stakeholders, investors and the general public. Oil price movement as an external factor influencing the performance of banks, may affect macroeconomic events which, in turn, influence cash flows significantly in the finance and banking industry. Examining the performance of banks and how oil price movement impact their performance significantly those operating in oil exporting countries, is of interest of bank managers and policy makers. It will help top level managers of banks to be aware of relationship between oil price movement and the performance of their banks and will help them in formulating better policies and strategies in taking on opportunities and avoiding possible risks which this movement may cause. Moreover, it will help policy makers in oil exporting countries to understand how the banking industry of an oil exporting country can reap benefits from economic booms as a consequence of an increase in the price of oil.

Therefore, this thesis attempts to investigate the impact of oil price movement on the performance of banks under different operational styles in oil exporting countries. The sample is consisting of 98 commercial, investment and Islamic banks in eight Middle Eastern oil exporting (MEOE) countries during the period 2000-2011.

The research applies a two-stage Data Envelopment Analysis to examine the impact of oil price movement on performance of banks. In the first stage, four different efficiency scores of banks operating in the MEOE countries are derived and compared. The empirical results suggest that overall, MEOE banking industries mostly suffer from poor usage of and mal-location of resources by management to produce outputs, rather than a failure in operating at the most productive scale. A low level of overall technical efficiency in the MEOE banking industry means that management has poor skills in controlling operating expenses, marketing activities, absorbing deposits and the monitoring and effective screening of borrowers. In the second stage, to find out the impact of oil price movement on the performance of banks, technical efficiency scores obtained from the first stage are regressed over the oil price movement variable and environmental variables. The empirical results show that while oil revenue impacts the

efficiency of the banks directly, positive oil price shocks impact efficiency of banks indirectly, and through inflation and economic growth. These findings suggest that when there is an increase in the price of oil, banks operating in oil exporting countries will derive benefit from the surplus income injected into the economy and their performance will be enhanced.

Keywords: Bank Efficiency, DEA, Oil Price movements, Middle East Oil Exporting countries

DEDICATION

This thesis has been dedicated to the loving memory of my parents. Certainly I would not have been able to start this chapter of my life at Brunel Business School without their unlimited support, love and encouragement. And, I would not have been able to endure all the pain, grief and hardship of their loss in the midst of this chapter of my life if it had not been for the beliefs and lessons in how to live which they taught me. Unfortunately, now that I am reaching the last lines of this chapter they are not here with me to see that I reached the end but I am sure they are somewhere out there always watching closely over me.

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LIST OF ABBREVIATIONS

BCC	Banker, Charner and Cooper
BIS	Bank of International Settlement
BMA	Bahrain Monetary Agency
CCR	Chames, Cooper and Rhodes
COLS	Corrected Ordinary Least Square
CRS	Constant Return to Scale
DEA	Data Envelopment Analysis
DFA	distribution Free Approach
DIFC	Dubai International Financial Centre
DIFE	Dubai International Financial Exchange
DMU	Decision Making Unit
EMH	Efficiency Market Hypothesis
EQTA	Equity to Total Asset
FE	Fixed Effect
EU	European Union
GAAP	Generally Accepted Accounting Principles
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
GCC	Cooperation Council for the Arab States of the Gulf
GEE	Generalized Estimation Equations
GDP	Gross domestic product
GLS	Generalise Least Square
GLM	Generalized Linear Models
GMM	Generalized Method of Moments
G-7 countries	Canada, France, Germany, Italy, Japan, the United Kingdom and the United States
IMF	International Monetary Fund
LATD	Liquidity to Total Deposit
LLRTA	Loan Loss Reserve to Total Asset
LSDV	Least Square Dummy Variable
MENA	Middle East and North Africa
MEOE	Middle East Oil Exporting
MOLS	Modified Ordinary Least Square
NBFI	Nonbanking Financial Institutions
OBU	Offshore Banking Units
OECD	Organisation for Economic Co-operation and Development
OED	Oil Export Dependency
OER	Oil Export Revenue
OEV	Oil Export Volume
OILVOLt-	Negative volatility in price of oil
OILVOLt+	Positive volatility in price of oil
OLS	Ordinary Least Square
OPEC	Organization of Petroleum Exporting Countries
OR	Operational Research

OTE	Overall Technical Efficiency
PEC	Primary Energy Consumption
PTE	Pure Technical Efficiency
QCB	Qatar Central Bank
QMA	Qatar Monetary Agency
RE	Random Effect
ROA	Return On Asset
ROE	Return On Equity
ROI	Return On Investment
ROILP+	Positive oil price shock
ROILPt-	Negative oil price shock
SAMA	Saudi Arabian Monetary Agency
SCP	Structured Conduct Performance
SE	Scale Efficiency
SFA	Stochastic Frontier Approach
TBI	Trade Bank of Iraq
TFA	Thick Frontier Approach
TFP	Total Factor of Productivity
UAE	United Arab Emirates
UAE	United Arab Emirates
VAR	Vector Autho Regressive
VRS	Variable Return to Scale
ΔLn(OP)	Net oil price increase at time t

Declaration

I sepideh Kaffash declare that this thesis, its idea, analysis, findings and conclusions that are included in this PhD dissertation are entirely developed by me for the purpose of this programme only and have not been submitted for another qualification.

Chapter 1 INTRODUCTION AND OVERVIEW

Banks as the most evident financial institutions which provide a range of financial services in their primary role as intermediary from lenders and borrowers of money to sophisticated tools concerned with credit and liquidity provision, risk management and remittance of funds play a vital role in the economy of countries. Moreover, various studies have discussed how economic growth is affects by the performance of financial intermediation while others argue that systemic crises can be caused by bank insolvencies (Fethi and Pasiouras, 2009). Therefore, measuring the performance of banks, and identifying the factors which impact it, is an issue of major interest for regulators, policy makers, stakeholders, investors and the general public.

This chapter starts by looking at the research background and the motivation which resulted in doing this research followed by a section that states the main aim and objectives of the research. Furthermore, a brief overview of the research approach and an outline of the thesis will be given.

1.1 Research background and Motivation

In recent years many studies have focused on the link between macroeconomic variables and oil price movement. These studies demonstrate that oil price movement impacts significantly economic activities in both emerging and developed countries [Cologni and Manera (2009), Cunado and Perez de Garcia (2005), Gronwald (2008), Balaz and Londarev (2006), Kilian and Vigfusson (2011), Cologni and Manera (2008), Cunado and Gracia (2005)]. However there is only one study on the relationship between oil price movements and bank performance. Hesse and Poghosyan (2009) examined the impact of oil price shock on the performance of banks in MENA countries over period 2000-2011.

One rationale for examining oil price movement as a factor influencing the performance of banks is that, oil price movement may affect macroeconomic events which, in turn, influence cash flows significantly in the finance and banking industry. Therefore, it worth researching what is the relationship between oil price movement and bank performance. Hesse and Poghosyan (2009) measure the performance of banks by simple financial ratio, return on asset and investigated the influence of oil price shock by applying dynamic panel technique.

The performance of banks has been measured by two approaches in the studies in the literature; accounting-based and economic-based. In the first approach comprehensive information from financial statements has been applied to determine the profitability of banks such as return on assets or return on equity. The second approach uses an efficiency concept which is measured by the distance away from the ideal frontier. The ideal frontier is made of the highest profit or the lowest cost banks in the sample.

In literature the efficiency of banks has been measure by parametric and non-parametric frontier techniques. Data Envelopment Analysis (DEA) is a non-parametric technique which constructs a piece-wise surface of the best-performing units and the performance of other units is measured as the distance from the surface and for the first time introduced by Farrell (1957). A large body of literature examines the efficiency of banks operating in specific countries (e.g. Pasiouras, 2008; Sufian, 2009; Isik, 2008) while some more studies investigate the efficiency of banks in cross-country studies (e.g. Tanna, 2009; Avkiran, 2009; Gonzalez, 2008).

No matter how the efficiency of banks has been measured, several issues which impact the efficiency of banks have been examined in the literature to explain why some banks perform better than others and to guide those inefficient banks in improving their performance. For instance, the relationship between a bank's efficiency and its share price (e.g. Pasiouras et al., 2008), the comparison in efficiency between foreign and domestic banks (Ataullah and Le, 2006; Isik and Hassan, 2002;) the impact of off-balance sheet activities on bank efficiency (e.g. Lozano-Vivas and Pasiouras, 2008), the impact of mergers on bank efficiency (e.g. Al-Sharkas et al., 2008), the impact of regulations and supervisions (Pasiouras, 2008) and the impact of regulatory factorson bank efficiency (e.g. Drake and Hall, 2006).

The main rationale for doing this research is the gap in literatures of both bank efficiency studies and oil price movement studies which will be thoroughly explored in the literature review chapter. Reviewing the literature guides researcher to investigate the impact of oil price movements on performance of banks. However the researcher has subjective reasons for being interested in selecting banks operating in the Middle Eastern Oil Exporting countries. Firstly, the banking industry of these countries is the home of Islamic banking in the world so it is a good sample for studying the impact of oil price movements on the performance of banks with different operational styles. Secondly, these countries are major oil exporters in the world energy market and the

performance of many industries may be susceptible to oil price movement. Finally, oil income injected into the economies of these countries makes the markets of these countries a very promising region for international portfolio diversification. Therefore, this study, for the first time, will identify the impact of oil income and oil price changes on the efficiency of banks operating in the Middle East oil exporting countries. A new term ‘’ MEOE’’ countries will be defined which refer to Middle East Oil Exporting countries.

It is of interest to bank managers and policy makers to examine the performance of commercial, investment and Islamic banks operating in MEOE and how oil price movements impact their performance. For the managers of banks, the determination of relative performance operating under three different operational styles will encourage managers to improve the performance of their banks. Moreover, the results of this study will help top level managers of banks to be aware of relationship between oil price movement and the performance of their banks and will help them in formulating better policies and strategies in taking on opportunities and avoiding possible risks which this movement may cause. The findings of this research will help policy makers in oil exporting countries to understand how the banking industry of an oil exporting country can reap benefits from economic booms as a consequence of an increase in the price of oil.

1.2 Aims and Objectives

The main aim of the research is to discover if there is a relationship between oil price movements and the performance of banks in MEOE countries, or not. This investigation will be done through proposing and validating a framework which will discover and analyse the efficiency of banks operating with three different operational styles in MEOE countries and the impact of oil price proxies on the efficiency of banks. The objectives of this research have been outlined as bellow:

1. To examine the efficiency of commercial, investment and Islamic banks operating in MEOE countries
2. To investigate the impact of oil revenue on the efficiency of banks operating in MEOE countries and whether this impact is direct or indirect

3. To investigate the impact of oil price shock, oil price volatility and oil price net increase on the efficiency of banks operating in MEOE countries and whether this impact is direct or indirect

4. To examine if oil price movements impact the efficiency of banks, which banks have been affected most

1.3 Research approach

In this research different methodologies and datasets will be applied to address the research objectives. The research methodology begins with conducting a literature review of theories relating to measuring the performance of banks.

To address the first research objective, Data Envelopment Analysis technique will be applied to measure the relative performance of commercial, investment and Islamic banks. Four different efficiency scores (Pure Technical Efficiency, Scale Efficiency, Overall Technical Efficiency and Super Efficiency) will be obtained and the overall measure of each efficiency type will be analysed by country and by operational style over the research period. The efficiency scores will be measured by selecting inputs and outputs. Inputs and outputs will be selected using the intermediation approach which considers banks as financial intermediaries that apply inputs in order to produce outputs.

To address the other research objectives, a technical efficiency score, which will be obtained from Data Envelopment Analysis techniques, will be regressed on oil price movements and environmental variables. The reason for selecting pure a technical efficiency score as the only dependent variable is that this type of efficiency score measures each individual bank performance compared only with other banks of a similar size, instead of against all banks.

Two groups of oil price variables will be applied to proxy movements in the price of oil. Firstly, the oil revenue variable, which will be measured as annual oil export revenue to GDP, will indicate how much an economy is dependent on oil revenue. Secondly, net oil price increase, oil price shock and oil price volatility will be presented separately showing their positive and negative movements. Two categories of environmental variables will be included in the model as well. These are bank-specific variables which are capitalization, liquidity and credit risk and also country-specific variables which are inflation, economic growth and market concentration.

The dataset covers 89 commercial, investment and Islamic banks in eight oil exporting countries in the Middle East (Iran, Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates) between 2000 and 2011, yielding a sample of 899 observations. Inputs and outputs data which enable the calculation of efficiency scores are sourced from financial statement of banks from the BankScope while macroeconomic data are sourced from IMF International Financial Statistics. The oil price is defined as the ratio of the simple average of three crude oil price measures- UK Brent, Dubai and West Texas Intermediate in the US dollar per barrel to the US GDP deflator. Although weekly, monthly or quarterly data for oil prices exist on the databases, low frequency (yearly) data will be employed in this research because of the availability of an annual dataset on banks' financial statements.

In order to find out if the oil price affects the performance of banks or not, firstly only bank specific variables will be included in the model. If the impact of the oil variables is significant then it will be concluded that there is a meaningful relationship between the oil price movement and bank performance. Next, country-specific variables will be included in the model as well. If the impact of the oil variable remains significant, it will be concluded that the oil price movement impacts the performance of banks directly, otherwise it will be suggested that the oil price movement impacts the performance of banks indirectly and through macroeconomic channels.

1.4 Thesis Outlines

The thesis consists of eight Chapters.

Chapter One: Introduction and Overview

This chapter introduces and provides the background to the gap in literature which this research addresses, and states the aim and objectives of this research. This is followed by an explanation of the research methodology and an outline of the thesis.

Chapter Two: A review of the literature

This chapter consists of two parts. The first part combines relevant studies of the banking industry in MEOE countries, socio-economic history, and the existing financial banking structures of these countries while the second part reviews the literature of relationships between macroeconomic variables and oil price variables. Moreover, a summary of the history of oil price movements will be presented in the second part.

Chapter Three: Efficiency measurement in the Banking Industry

This chapter introduces accounting-based and economic-based perspectives on performance measurement followed by an explanation of frontier efficiency measurement. The preferred technique for measuring the efficiency of banks and definitions of the terms of the technique will be discussed in this chapter. The gap in the literature on bank efficiency studies will be presented in this chapter.

Chapter Four: Research Methodology

This chapter presents the conceptual framework and research approach which were produced from the theories and ideas which arose from the literature review and banking measurement models. Each segment of the framework, the methods applied in each segment of the framework, and clarification of what is involved in each step relating to the credibility of this research and the software utilized to produce the results in each stage will be described.

Chapter Five: Data Collection

This research discusses how the research was conducted in the research phases and framework which will be explained in Chapter Four. Selected input and outputs, environmental variables (bank-specific and country-specific variables) and oil price movement variables will be discussed and the choice of the databases used to gather these data will be explained.

Chapter Six: Finding and Discussions

This chapter will address the research questions in three sections. The first section will measure the four types of efficiencies of three different operational styles of banks operating in eight oil exporting countries in the Middle East and compare the efficiencies across countries and across operational styles by applying standard DEA and super DEA techniques. The second section will incorporate the contextual and oil revenue variables to address the question of whether oil revenue is an important factor which impacts the performance of banks, whether this is a direct or indirect impact and banks with which operation styles have been most affected. The third section of this chapter will follow the same method but the oil revenue variable will be replaced by three different oil price changes variables: oil price shock, oil price volatility and net oil price increase.

Chapter Seven: Contributions to Knowledge

In this chapter the contributions that this research will make to knowledge will be discussed in three different aspects: contribution to the theory, methodology and practical implications. The contribution to the literature will be in two parts; firstly, contributions to the Middle East bank performance literature and, secondly, contributions to the oil price changes literature.

Chapter Eight: Conclusion

This chapter begins with an overview of the techniques which are applied to measure the performance of banks and the framework is developed to assess the impact of oil price on the performance of banks. A summary of the findings of the research and answers to research questions are presented followed by an explanation of the policy implications of the research, stating its limitations and suggesting future studies.

1.5 Chapter Summary

In this chapter an introduction and overview of whole thesis is presented. The chapter starts by representing the motivation behind doing this research and identifying the gap which the researcher found by reviewing the relevant literature. The aims and objectives of the research, in addition to an overview of the methodology are explained. The last section of this chapter discussed briefly the thesis outline and a very brief summary of each chapter.

Chapter 2 BANKING INDUSTRY IN THE MIDDLE EASTERN OIL EXPORTING COUNTRIES

This objective of this section is to give a wide view of the banking landscape covering the various oil exporting countries that geographically belong to the region referred to as 'the Middle East' (Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates). These countries have been labelled in this research as MEOE countries. In the first section of this chapter light will be shed on the socio-economic history of these countries and this will help provide insight into how the existing financial banking structures of these countries came into being. Following this section, some of the distinct characteristics of the banks in this region, such as asset size, ownership structure and concentration, will be discussed.

The penultimate section of this chapter will give a thorough description of the Islamic banking system which is an integral part of the economy of this region and will explain in detail what is meant by Islamic banking, what are its main characteristics and how it differs from a conventional banking system. A brief section on the Arab Spring and how it impacts the banking system in this region is also included towards the end.

2.1 Socio-Economic background of MEOE countries

The oil exporting countries in the Middle East consists of the six Persian Gulf Corporation Council (Persian GCC) countries of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE along with Iran and Iraq.

Previously, banking within the GCC countries consisted mostly of foreign owned banks of which the majority were British Banks that had branches across all the six GCC countries. However, this scenario has gradually changed over a period of time. The background of each of the eight oil exporting countries is discussed in following sections.

2.1.1 Bahrain

The very first commercial bank to be opened in Bahrain was a branch of the British owned Eastern Bank in 1921 and it was only after two decades that a second bank was opened – the British Bank of the Middle East. Nevertheless, in 1957, Bahrain got its first bank with national ownership – the National Bank of Bahrain and when the Bahraini Dinar replaced the Indian Rupee in the 1965, other banks started to perceive

Bahrain as an attractive location for investment. By 1974, up to fourteen commercial banks were opened in Bahrain.

The increase in the number of banks in Bahrain post-independence in 1973 also led to the introduction of the BMA (Bahrain Monetary Agency). In 1975, the BMA introduced a set of rules to regulate the opening of the OBUs (Offshore Banking Units) that was in accordance with the model of Singapore. The OBUs represented the branches of international commercial banks with special privileges pertaining to foreign exchange control, taxes on depositors' interest, and taxes on banks' incomes. This position significantly differed from the status of Bahrain's other banks (Federal Reserve Division, 2004). The civil conflict in Lebanon also had a very stimulating effect on OBU's expansion and led to the transfer of a number of international banks from Beirut to Bahrain post 1975.

In the early 1980s, the 75 OBUs operating out of Bahrain had accumulated up to 62 Billion Dollars' worth of assets. Nevertheless, by 1985, the decrease in oil prices and corresponding decline of oil revenues led to a dramatic reduction in deposited funds in both onshore and offshore banks. The decision of some of the banks to not extend their OBUs 'licenses led to net losses for many OBUs. However, a majority of OBUs still managed to maintain their productive efficiency within their Bahrain offices according to the Comparative Study of the Commercial Banks of Gulf Region. In the 1990s, 45 OBUs were situated in the island nation (Federal Reserve Division, 2004).

Regardless of the Persian Gulf's financial fluctuations in the 1980s, Bahrain managed to promote itself as the main financial and banking centre of the entire region. One of the very first countries outside the G10 group to apply to the BIS (Bank of International Settlement) with 8% capital adequacy ratio was the BMA of Bahrain (Federal Reserve Division, 2004).

2.1.2 Iran

Iran has a long tradition in auditing and financial institutions (Salehi, 2008). The first British bank under the name of the New East Bank was opened in 1850. Later in 1885, the Iranian government granted Baron Julius De Reuter with a concession for establishing the Shahanshahi Bank (Imperial Bank) and following that Imperial Bank acquired New East Bank's assets (Salehi, 2011).

When it comes to banks that were established with predominantly Iranian capital, the Sepah Bank was founded in 1925 under the name of the Pahlavi Qoshun Bank and it had a primary objective of catering to the financial requirements of the army personnel. The initial capital of this bank was 3,883,950 Rials (Iranian currency) (Salehi et al, 2008).

The Melli Bank got its approval for establishment in 1927 and was authorised to act as the Central Bank until 1960 when the Central Bank itself was established. In this timeframe, the legislation shaped the structure and responsibility of the Melli Bank and it issued notes and acted as banker for the government, kept accounts, marketed government securities, maintained foreign exchange reserves, and oversaw international transactions. It also set standards for the supervised financial institutions, established credit and monetary policies, and took measures to enforce credit and monetary policies. The banking laws capped foreign participation to a maximum of 40% for any banks operating in Iran (Federal Research Division, 2004).

After the Iranian Revolution, in March 1984, the Islamic banking system was officially incorporated and profit sharing became the official norm replacing the then existing banking norm of interest payments. Also, despite the first Persian Gulf War, the Central Bank managed to retain its good connections with international banks in the 1980s and with no long-term foreign debt in 1987, except for an insignificant amount of $5 million, it gained recognition as a creditor on an international level.

The Iranian government also managed to repay an amount of $7 billion in debts through $66 billion worth of imports between 1979 and 1984. However, this promptness of the government in repaying its financial obligations did not motivate banking circles from Western Europe to lend any significant amount of money to Iran. As a result, the Iranian government had to deal with cash-flow issues in the period following 1983 using the amounts repaid by certain countries which had borrowed from Iran during the regime of Mohammad Reza Shah (Federal Research Division, 2004).

In 1994, the Central Bank of Iran allowed the founding of private credit institutions. This also included the authorization for foreign banks to operate their full scope of banking services within the free-trade zones of Iran in 1998. The government also continued with its policy of liberalization of the banking policies in 2001 (Ilias, 2008).

In 2006, as a reaction to Iran's alleged nuclear weapons program, various countries and multinational entities imposed sanctions against Iran. The bans imposed by various countries on transactions with Iranian banks, the bans on investment in the Iranian energy sector and the asset freezes of individuals and entities involved with Iran's nuclear program adversely affected the banking system of the country. However, the sanctions imposed by the European Union in 2012 disconnecting all Iranian banks from SWIFT, the world's hub for financial transactions, turned out to be the crippling blow that ruined the Iranian foreign banking system (The Reuters, 2012).

2.1.3 Iraq

After the First World War and British influence, Iraq became a part of the Indian monetary system with the Rupee as the main currency. In 1947 the National Bank of Iraq was established. According to the Federal Research Division (2004), this bank took over the tasks of notes issuing and reserve maintenance in 1949 which were previously regulated by the London-based currency board.

The National Bank of Iraq was transformed into the Central Bank of Iraq in 1956. The tasks of the Central Bank included currency management, foreign exchange control, and banking system supervision (Federal Research Division 2004). By the 1960s, many foreign banks were established in Iraq and they included the Ottoman Bank, the Eastern Bank owned by the British and the British Bank of the Middle East.

In 1964, as the result of the massive nationalization under the first Ba'ath rule banks were merged and formed into the following main groups of banks: Rafidain, Commercial, Baghdad Bank, and Credit Bank. Additionally, one more restructuring followed in 1970 within two main groups -Rafidain and Commercial. Later in 1974, the Commercial group was supervised under the Rafidain banner, which meant that this was the only remaining bank owned by the state (Federal Research Division 2004).

The second Persian Gulf War had devastating effects on banks owned by the state. It is estimated that Rafidain incurred losses of $300,000,000 due to the destruction of most of its offices and branches. Additionally, its currency losses were estimated at $69,000,000 (Federal Research Division 2004).

A new bank owned by the state was founded in 2004 by the Iraqi government under the name Trade Bank of Iraq (TBI) for the purpose of dealing with trade related financing under the new circumstances. It was initially planned that this bank would serve this function temporarily until the situation in Iraq normalized. However, certain events eventually led to an increase in the roles for this bank and it was later transformed into the Universal Commercial Bank. Meanwhile, the control of the Central Bank of Iraq over TBI's operations was not considered to be particularly strong either (World Bank, 2013).

In February 2009, the government introduced a two-phase Banking Sector Reform Strategy (2008-2012). The aim of this reform was to modernize the existing banking sector with the World Bank's support. However, the efforts in this area were predominantly focused on restructuring the Rafidain and Rasheed Bank which were owned by the state (World Bank, 2013).

2.1.4 Kuwait

Originally occupied by Arab tribes in the first decades of the 18th century, Kuwait later became a protectorate under the British government in 1897 and later won its independence in 1961. In 1990, Iraq invaded and occupied Kuwaiti territory that led to the Persian Gulf War in 1991. A coalition of Arab and western forces drove the Iraqi troops out of Kuwait later.

Due to its enormous oil reserves discovered back in 1938, Kuwait has one of the largest per capita incomes in the world. While British investors had opened the very first bank in Kuwait in 1941, the laws of Kuwait did not allow foreign banks to invest in its country for a certain period of time.

Eventually, when the British concessions for opening any new bank expired in 1971, the government itself bought the 51% stake in the bank's ownership and the National Bank of Kuwait was founded in 1952. The founding of the Credit and Savings banks subsequently followed in 1965 (Federal Research Division (2004).

The economic prosperity of the 1970s enabled many individuals with substantial assets at their disposition. As expected, these funds led to the increase in speculation in the mid-1970s which culminated in an economic crash in 1977. The government response to this crisis was to help threatened investors with a bail out which was

followed by the most rigorous regulations. However, these measures strongly contributed to a market crash in 1982.

As consequence of the market crash in 1982, the banks had to face non-performing loans as well as a drop in value of real estate collaterals. In following years, continuing uncertainty about the collapse of oil prices caused a recession with devastating consequences that affected all levels of society (Darrat et all, 2003)

The market crash of 1982 also lead to the automatic insolvency of Kuwait banks despite the supporting activities of its Central Bank. The only exception was the National Bank of Kuwait, which was the only commercial bank to go through the crisis unharmed. According to the Federal Research Division (2004), the government was forced to intervene with the Difficult Credit Facilities Resettlement Program. However, this program's implementation was interrupted by Iraq's invasion in 1990.

2.1.5 Oman

Oman's banking sector is the smallest in the Middle East. In geographical terms, Oman is bordered mostly by the Gulf of Oman and the Arabian Sea but it also shares land borders with Saudi Arabia and the UAE among the other oil exporting countries of the Middle East. According to the Federal Research Division (2004), Oman's main contact with rest of the world was via the sea.

The banking law of 1974 mainly influenced the creation of Oman's banking sector which led to the introduction of the CBO (Central Bank of Oman). This move paved way for the founding of banks with foreign capital including a number of local banks. By 1992, three banks were specialized for development issues. The Oman Housing Bank and The Oman Development Bank were both established in 1977 and The Oman Bank for Agriculture and Fishing was established in 1981 (Federal Research Division, 2004).

2.1.6 Qatar

Qatar is one of the smallest countries in the world in terms of both land territory and population. It is a country that is surrounded by the Persian Gulf on three sides. Qatar's economy is strongly influenced by its tradition, nomadic culture and pearl-diving. The economic situation at the end of the 1930s was not prosperous. However, the discovery of rich oil fields in the 1940s completely transformed this once

undeveloped country into one the fastest growing economies of the world in terms of development according to the Federal Reserve Research (2004).

The Indian Rupee was the first currency to be used in Qatar. This was the consequence of the treaty signed with Britain in 1916. During May of 1959, the Gulf Rupee replaced the Indian Rupee (Bank Note of Qatar, 2000). However, in the same year, in order to prevent smuggling of gold from Qatar to India, the Qatari government was forced to introduce a special kind of Gulf Rupee.

Qatar and Dubai introduced a currency board in the form of Qatar-Dubai Riyal (Federal Reserve Research 2004). But following Dubai's integration into United Arab Emirates in 1971, the decision was made not to rely on the Qatar Dubai currency any further. As a direct result, in 1973, the QMA (Qatar Monetary Agency) was created. The main purpose of the QMA according to the Qatar Central Bank resources (2008) was to take the role and duties of a central bank.

According to the Federal Research Division (2004), the QMA dealt with issues of banking regulations, credits and finances. Additionally, the QMA was also in charge of issuing currency and managing the reserves of foreign currencies which were necessary for supporting the Qatari Riyal. This agency had a specific role in 1973 untypical of the central bank which was related to the sharing of control over Qatar's reserves with the Ministry of Finance and Petroleum. The QCB (Qatar Central Bank) took over the role of the QMA in 1993 and now has a supervisory role. The QCB introduced international banking standardization according to the Basle Accord.

2.1.7 Saudi Arabia

Saudi Arabia did not have money or a banking system in a formal sense till the middle of the 20th century. It is worth mentioning that only a few banking functions were present then and this included money exchange for the visitors to Mecca who were using international currencies.

Although, the first foreign bank was founded in Jeddah as early as in 1926, it did not have any significant importance. As expected, the development of the banking sector was later shaped and determined by the development of oil production (Federal Reserve Research, 2004). In 1927, the Silver Riyal was introduced by the government with a goal to standardize the monetary units in circulation. Additionally, the constant growth and development based on oil production

eventually led to the introduction of more formal rules and policies in the 1950s (Federal Reserve Research, 2004).

The influence of the royalty revenues of the government came with the discovery of oil in 1939 and it extended through the Second World War. The increase in the Saudi government's revenues and expenditures grew rapidly which eventually led to a significant presence of foreign banks in the domestic financial market. In Jeddah, the first branches were opened by the French Banque de L'Indochine and the Arab Bank in 1948. The British Bank of Middle East, Pakistan National Bank and Misr Bank of Egypt opened their branches in 1950 (Federal Reserve Research, 2004).

The SAMA (Saudi Arabian Monetary Agency) was founded in 1952. This agency was originally designed to take the role of the central bank in accordance with the regulations of the Islamic Law. The role and position of this agency was additionally clarified by the introduction of the Law for Banking Control in 1966. All banks were obliged to submit their bank license applications to the SAMA. These applications were followed by the SAMA's recommendation and delivered to the Ministry of Finance and National Economy. However, it was the Council of Ministers that was in charge of issuing the conditions of the foreign bank licenses. Additionally, the issue of reserves and deposits were regulated by the law. When it came to the SAMA's opportunities to influence the monetary policy there were restrictions imposed by certain regulations. The SAMA was not allowed to extend bank credits including the possibility of using the discount rates because they were treated as interest forms (Al-Karasneh & Fatheldin, 2005).

The 1980s were particularly challenging for the banking sector in Saudi Arabia. The unprecedented increase in the government's revenues followed by the revenue fluctuations between 1982 and 1986 forced the banks to adjust their structure rapidly to the new conditions. The most important moment in the restructuration of the banking system was the merging of the United Saudi Commercial Bank and Saudi Cairo Bank into the new entity called the United Saudi Bank in 1997. In 1999, the banking system of Saudi Arabia was fully prepared for the increase in the number of banks. This was enabled by the decision of the Gulf Cooperation Council Prime Ministers to allow the opening of the banking markets based on reciprocity.

According to the Bank Al-Hamid, A. (2006), the introduction of the Real Time Gross Settlement Electronic Funds Transfer System in 1997 stimulated investment in new

technologies in the banking system. The direct result of these measures was the expansion of foreign banks in Saudi Arabia that included Deutsche Bank, JP Morgan Chase and BNP Paribas, among others, and the establishment of HSBC with an investment banking operation.

2.1.8 United Arab Emirates (UAE)

The United Arab Emirates represent a federation of several emirates. This federation was created in 1971 following the British withdrawal from the Persian Gulf due to security issues and was formed by the merging of the six states known at that time as the Trucial States. A seventh emirate, Ras Al-Khaymah, joined the federation in 1972.

The federation system is based on a high level of autonomy for the individual emirates which have their own rulers with the exceptions of Sharjah and Ras Al-Khaymah which have one ruling family (Federal Reserve Research, 2004). Due to the unprecedented development in the last 40 years on account of oil production, the UAE has completely transformed from a small regional country to a globally recognized economic power.

In the heart of the federation system sits Abu Dhabi - the financial, political and production centre. The second most important emirate of the federation is Dubai which is the centre for trade and has an economy oriented towards services such as tourism, telecommunication, finances etc. When combined, these two emirates contribute to over 80% of the UAE's income (Federal Reserve Research 2004).

The Central Bank of UAE was founded in 1980 with an objective of governing monetary, credit and banking related policies. However, the issue of gold reserves and foreign currencies came under the government's exclusive jurisdiction. Due to the demand of world trade to make the banking sector of the UAE more transparent and accessible for foreign banks, certain changes were started in 2004. Nevertheless, new licenses for foreign banks have not been issued since 2005 (Federal Reserve Research, 2004).

The DIFC (Dubai International Financial Centre) was officially launched in September 2004 and it represents a financial free zone with self-regulating mechanisms. In addition to this, the DIFC has independence for its operations from the Central Bank of the UAE. The DIFE (Dubai International Financial Exchange)

was founded in September 2005 with the primary purpose of supporting domestic markets but it is also supposed to aid the country in opening up its shores to foreign investors (Federal Research Division, 2004).

2.2 Characteristic of the banking industry of the MEOE countries

The Banking sectors in GCC countries and two non GCC countries (Iran and Iraq) have dominated the financial sectors in this region. Analysis of banking sectors in these countries is essential in gauging the sources of strengths and vulnerabilities, and understanding how these systems could be affected during changing economic conditions.

The presence of Nonbanking Financial Institutions (NBFIs) is very limited in the MEOE countries and while there has been rapid investment fund growth in some of these countries, investments have been limited to the domestic equity market and real estate (Al-Hassan et al., 2010). Also, a notable point is that the financial sectors of oil exporting countries are relatively smaller compared to other countries with comparable levels of income. This evidently shows that the gross domestic profit (GDP) levels of countries can grow substantially on the strength of oil revenues alone without a necessity for proportional increases in economic and financial activities. It is also to be noted that inflation can reduce the real return on financial instruments and their relevant ratios to GDP.

It can be inferred that both banking penetration and access to credit are limited within the oil exporting Middle East countries on the basis of the fact that these countries have a lower number of deposit and loan accounts per adult. This fact can be deemed even more peculiar considering that in this region deposits and credits are quite sizeable when compared to the GDP. This anomaly therefore highlights the lack of correlation between financial depth and actual financial access.

The banking sectors in these countries are also marked by a weak financial infrastructure, a lack of competition and institutional flaws as well as flaws in the legal framework which hinder the overall growth of the sector and are responsible for poor access outcomes. The banking sectors in these countries concentrate mostly on large enterprises and mostly fund large loans to the real estate and the oil and gas sectors – a fact that is revealed when one considers that the banking sectors of these

countries have the highest loan concentration in the world, like that of the MENA's banking sector (Al-Hassan et al., 2010).

The main characteristics of the banking industries of the MEOE countries are discussed in the subsections that follow.

2.2.1 Asset Size

One outstanding characteristic of the MEOE countries is their large asset size. However, according to a review published by Financial Access and Stability in September 2011, though these countries have banking systems with a relatively large asset size compared to emerging market countries, and despite the fact that they have managed to ride through the global financial crisis uneventfully, the banking systems in these countries are still considered under-developed. Table (2.1) outlines the asset sizes associated with each of the leading banks in the Middle East oil exporting countries.

Table (2.1) illustrates that the largest asset based bank is Qatar National bank followed by National Commercial Bank of Saudi Arabia. Three banks operating in Saudi Arabia are among the top ten (asset based) banks in MEOE countries. Bank Melli Iran has the largest number of branches followed by Bank Mellat, which is not surprising since Iran is a large country. Qatar National Bank has more presence in Global compare to the other ten banks.

Table 2-1) Ten leading banks in the MEOE countries by asset size

Bank	Number of domestic branches	Number of global branches	International presence (no. of countries)	Total asset $ billion (2011)
Qatar National Bank(Qatar)	60	335	24	83
National Commercial Bank (Saudi Arabia)	384	n/a	7	80.3
Emirates NBD PJSC (UAE)	168	n/a	7	77.5
National Bank of Abu Dhabi (UAE)	110	160	13	69.6
Bank Melli Iran*,**	3291	12	11	59
Al Rajhi Banking & Investment Corporation-Al Rajhi Bank* (Saudi Arabia)	401	n/a	3	58.8
Bank Mellat *,** (Iran)	2984	11	11	55.9
Samba Financial Group*(Saudi Arabia)	74	n/a	4	51.4
National Bank of Kuwait S.A.K (Kuwait)	67	157	12	48.9

Source: Banker and Bank Scope

* Source: Official website of bank and author estimates ,** Iranian banks' data is based on data of 2010 according to availability

In order to have a better understanding of the banks operating in the MEOE countries Table (6.2) details the top ten banks in each of the studied Middle Eastern countries and the operational style of these banks.

From the Table (6.2), it can be seen that while the majority of banks among the top ten banks in Bahrain are commercial, there is also a significant presence of Islamic banks and a small presence of investment banks in the country. However, with respect to Iran, all the banks are Islamic. This table also shows that Iraq has an equally balanced presence of commercial, Islamic and investment banks among its top ten banks and Kuwait, which also has all three types of banks, has a strong majority of banks which are commercial in operational style. Also it can be observed that Oman has an overwhelming 80% of banks which are of the commercial type and 20% that are investment banks. Oman is the only country not to have any Islamic banks among its top banks. Also, while Qatar has a strong majority of commercial banks, it does not have any presence of investment banks. Lastly, both Saudi Arabia and UAE have proportions quite similar to Qatar and have a strong majority of commercial banks, a smaller presence of Islamic banks but no presence of investment banks amongst their top ten banks.

Table 2-2) Top ten banks (asset based) and corresponding operation style in each MEOX countries

Country	Bank name	Operational Style
Bahrain	Ahli United Bank BSC	Commercial
	Arab Banking Corporation BSC	Commercial
	Albaraka Banking Group B.S.C.	Islamic
	Gulf International Bank BSC	Commercial
	BBK B.S.C.	Commercial
	National Bank of Bahrain	Commercial
	Ithmaar Bank B.S.C.	Investment
	National Bank of Bahrain	Islamic
	Arcapita Bank B.S.C.	Islamic
	Investcorp Bank BSC	Commercial
Iran*	Bank Mellat	Islamic
	Bank Melli Iran	Islamic
	Bank Saderat Iran	Islamic
	Bank Tejarat	Islamic
	Bank Maskan	Islamic
	Persian Bank	Islamic
	Bank Pasargad	Islamic
	Saman Bank	Islamic
	Export Development Bank of Iran	Islamic

Country	Bank name	Operational Style
Iraq	North Bank	Commercial
	Bank of Baghdad	Commercial
	Iraqi Middle East Investment Bank	Investment
	United Bank for Investment	Investment
	Kurdistan International Bank for Investment and Development	Islamic
	Al-Bilad Islamic Bank for Investments & Financing	Islamic
	Credit Bank of Iraq	Investment
	Elaf Islamic Bank	Islamic
	Investment Bank of Iraq SA Co	Commercial
	Iraqi Islamic Bank for Investment & Develoomen SA	Islamic
Kuwait	National Bank of Kuwait S.A.K.	Commercial
	Kuwait Finance House	Islamic
	Kuwait Projects Holding K.S.C.	Investment
	Burgan Bank S.A.K.	Commercial
	Gulf Bank KSC (The)	Commercial
	Commercial Bank of Kuwait SAK (The)	Commercial
	Al Ahli Bank of Kuwait (KSC)	Commercial
	Ahli United Bank KSC	Commercial
	Boubyan Bank KSC	Islamic
	Gulf Investment	Investment
Oman**	Bank Muscat SAOG	Commercial
	National Bank of Oman (SAOG)	Commercial
	Bank Dhofar SAOG	Commercial
	HSBC Bank Oman	Commercial
	Bank Sohar SAOG	Commercial
	Oman International Development and Investment	Investment
	Oman Arab Bank SAOG	Commercial
	Dhofar International Development and Investment	Investment
Qatar	Qatar National Bank	Commercial
	Commercial Bank of Qatar	Commercial
	Qatar Islamic Bank SAQ	Islamic
	Masraf Al Rayan (Q.S.C.)	Islamic
	Doha Bank	Commercial
	Al Khalij Commercial Bank	Commercial
	Qatar International Islamic Bank	Islamic
	International Bank of Qatar Q.S.C.	Commercial
	Barwa Bank	Commercial
	Ahli Bank QSC	Commercial

Country	Bank name	Operational Style
Saudi Arabia	National Commercial Bank (The)	Commercial
	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	Islamic
	Samba Financial Group	Commercial
	Riyad Bank	Commercial
	Banque Saudi Fransi	Commercial
	Saudi British Bank	Commercial
	Arab Natioanl Bank	Commercial
	Saudi Hollandi Bank	Commercial
	Islamic Development Bank	Islamic
	Saudi Investment Bank	Commercial
United Arab emirates	Emirates NBD PJSC	Commercial
	National Bank of Abu Dhabi	Commercial
	Abu Dhabi Commercial Bank	Commercial
	First Gulf Bank	Commercial
	Dubai Islamic Bank	Islamic
	Union National Bank	Commercial
	Abu Dhabi Islamic Bank - Public Joint Stock Co.	Islamic
	Mashreqbank	Commercial
	Commercial Bank of Dubai P.S.C.	Commercial
	Emirates Islamic Bank PJSC	Islamic

Source: Author's calculations based on data retrieved from the Bank Scope database
* Data for Iran is based on 2010
** Data for Omani banks available for only eight banks

The next characteristic of banking industry of MEOE countries which will explained is banking system concentration which will explored in following section.

2.2.2 Concentration of banking system

The banking system in the Middle East oil exporting countries is very asset concentrated. Table (2.3) shows the concentration ratios upon total assets for the top three and top five largest banks for the studied countries during the year 2011. Of all Middle East oil exporting banking sectors in 2011, the Qatari banking system displays the highest proportion of concentration with 65% and 82 % for the three and five top banks respectively. The second to be ranked in terms of high concentration is the Omani banking sector. Here, the share of the top three banks in terms of assets amounted to 64% while for the top five banks it amounts to 79% of whole assets of Omani banking system in 2011. Finally, the Iranian banking sector exhibited the same picture in terms of high concentration. The share of top three and top five banks amounted to 56% and 77% respectively. In conclusion, the banking system in the Middle East oil exporting countries can be viewed as being a moderately-to a highly

concentrated system, with the UAE exhibiting the lowest and Qatar exhibiting the highest concentration.

Table 2-3) Asset concentration of banking industry in MEOX countries

Countries	Assets of top 3 banks	Assets of top 5 banks
Bahrain	0.51	0.69
Iran	0.35	0.53
Iraq	0.56	0.77
Kuwait	0.56	0.71
Oman	0.64	0.79
Qatar	0.65	0.62
Saudi Arabia	0.45	0.65
UAE	0.49	0.66

* Data for Iran is based on 2010

Table (2.4) shows the operational style and the corresponding share of total assets of the top five banks in the Middle East Oil Exporting countries. Except Iranian banks, which are unique in claiming that all of them follow Shariah and have the Islamic banking operational style, the banks holding the largest share of assets are commercial banks.

For some banking sectors like Qatar and Oman, the share of top commercial banks account for up to 46% and 41% of total banking system assets. While for the Iraqi banking system, the total share of the top two commercial banks are less than the share of the first top Omani and Qatari banks. Investment banks do not have any place among the top five banks for any other country apart from Iraq and Kuwait. The Kuwait Project Company Holding.is the largest investment bank in Kuwait with a share of 10% of the country's total banking system assets. The Iraqi Middle East Investment and United Bank for Investment are the two largest banks in terms of assets and have a cumulative share of 19% of the Iraqi banking sector. Oman is the only banking sector which does not have any Islamic banks among its five top banks. The Kuwait Finance House in Kuwait and Al Rajhi Banking & Investment Bank in Saudi Arabia are both Islamic banks and are the second largest banks in each of their respective countries, holding shares of 23% and 14% of the total assets of their respective banking sectors. Dubai Islamic Bank is the smallest bank among the five top banks in the UAE banking sector with only a 6% share of the total banking assets of the UAE.

Table 2-4) Share of total asset of five top banks in whole asset of banking industries of each MEOE countries

Country	Bank name	Operational Style	Share of Total Asset	Cumulative Share of Total Assets
Bahrain	Ahli United Bank BSC	Commercial	0.21	0.21
	Arab Banking Corporation BSC	Commercial	0.18	0.39
	Albaraka Banking Group B.S.C.	Islamic	0.12	0.51
	Gulf International Bank BSC	Commercial	0.12	0.63
	BBK B.S.C.	Commercial	0.05	0.69
Iran*	Bank Mellat	Islamic	0.2	0.2
	Bank Melli Iran	Islamic	0.2	0.39
	Bank Saderat Iran	Islamic	0.17	0.56
	Bank Tejarat	Islamic	0.13	0.7
	Bank Maskan	Islamic	0.09	0.78
Iraq	North Bank	Commercial	0.13	0.13
	Bank of Baghdad	Commercial	0.12	0.25
	Iraqui Middle East Investment Bank	Investment	0.1	0.35
	United Bank for Investment	Investment	0.09	0.44
	Kurdistan International Bank for Investment and Development	Islamic	0.09	0.53
Kuwait	National Bank of Kuwait S.A.K.	Commercial	0.23	0.23
	Kuwait Finance House	Islamic	0.23	0.46
	Kuwait Projects Holding K.S.C.	Investment	0.1	0.56
	Burgan Bank S.A.K.	Commercial	0.08	0.63
	Gulf Bank KSC (The)	Commercial	0.08	0.71
Oman	Bank Muscat SAOG	Commercial	0.41	0.41
	National Bank of Oman (SAOG)	Commercial	0.13	0.53
	Bank Dhofar SAOG	Commercial	0.11	0.64
	HSBC Bank Oman	Commercial	0.05	0.7
	Bank Sohar SAOG	Commercial	0.08	0.78
Qatar	Qatar National Bank	Commercial	0.46	0.46
	Commercial Bank of Qatar	Commercial	0.11	0.57
	Qatar Islamic Bank SAQ	Islamic	0.09	0.65
	Masraf Al Rayan (Q.S.C.)	Islamic	0.08	0.74
	Doha Bank	Commercial	0.08	0.82
Saudi Arabia	National Commercial Bank (The)	Commercial	0.19	0.1
	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	Islamic	0.14	0.33
	Samba Financial Group	Commercial	0.12	0.45
	Riyad Bank	Commercial	0.11	0.56
	Banque Saudi Fransi	Commercial	0.09	0.65
United Arab Emirates	Emirates NBD PJSC	Commercial	0.19	0.19
	National Bank of Abu Dhabi	Commercial	0.17	0.36
	Abu Dhabi Commercial Bank	Commercial	0.12	0.49
	First Gulf Bank	Commercial	0.11	0.59
	Dubai Islamic Bank	Islamic	0.06	0.66

* Data for Iran is based on 2010

2.2.3 The ownership structure of banks

The banking sectors within the countries under discussion are largely domestically owned. This draws attention to the fact that there are various entry barriers and licensing restrictions for foreign banks, including those which are owned by other countries within the GCC as well.

Within the six GCC nations, Bahrain is the only country that does not have limits on foreign ownership. Oman maintains the lowest threshold for foreign ownership at 35% while UAE limits the maximum foreign ownership at 40%. Both Kuwait and Qatar maintain a threshold of 49%. These thresholds ensure that the presence of foreign banks and that of GCC banks beyond their own respective country borders is limited to the form of branches or sometimes even a solitary branch. However, the presence of foreign banks is still substantial in Bahrain and UAE where such banks hold 57% and 21% of the total banking assets in each of these countries respectively. With respect to the asset holding size of foreign banks in terms of total assets in the rest of the GCC countries, the share is 2% in Saudi Arabia, 12% in Oman, 10% in Qatar and 10% in Kuwait (Al-Hassan et al., 2010).

In the domestic banking sector (which consists of banks having majority shareholding from amongst domestic residents) within GCC countries, the ownership by the public and quasi-public sector is quite significant. However, the proportion of public sector ownership varies widely between GCC nations. The public sector ownership is the least in Kuwait at 13%. It is relatively higher in Oman and Saudi Arabia at 30% and 35% respectively (though the majority holding within these numbers is attributed to quasi-government ownership) and is the highest in the UAE where public sector ownership stands at 52%. Of the 52% public sector ownership within the UAE's domestic banking system, 41.5% is attributed to direct ownership by the government and 10.3% is attributed to the royal family. Also, a noteworthy fact is that UAE is the only country in the GCC in which the royal family has ownership in the banking sector (Al-Hassan et al., 2010).

Both the UAE and Bahrain have a significant presence of foreign banks on their shores. There is also a sizeable presence of joint ventures in the domestic banking scene in Bahrain and Oman and the investors in such ventures are mostly foreign investors but mostly from within the GCC. However, the presence of such joint

ventures in the domestic banking sector in Saudi Arabia is very small and is negligible in the UAE and Kuwait (Al-Muharrami et al., 2006).

Among non GCC oil exporting countries in Middle East, Iran carried out privatization of its banks in 2008-09 and some of the largest banks in terms of asset size changed from having public sector ownership to private sector ownership. This includes banks such as Bank Mellat, Bank Refah and Bank Tejarat and also the much larger banks like Pasargad and EN banks. Additionally, a number of Finance and Credit Institutions were also authorized to operate as banks (such as Central Bank and the Islamic republic of Iran) in Iran.

Iraq, which is the second non Persian GCC oil exporting country in the Middle East, has 12 foreign banks present in its banking sector. Most of these banks are from Lebanon and these are followed by banks from the Gulf and Turkey. No Western bank has opened a branch in Iraq yet. However, the London-based HSBC, one of the world's largest financial institutions, owns a 70 per cent share in Dares Salam, a private Iraqi investment bank. Qatar, Kuwait, Jordan and Bahrain own large shares in Iraqi banks (Macropolis, 2012)

2.3 Islamic banks

The countries of the Middle East have an overwhelmingly Muslim population and this explains why the practice of Islamic banking is very prominent in this region. Though Islamic banking and financial activities are present in South Asia and Southeast Asia, the heart and soul of this banking practice lies in the Middle East. The majority of regulatory and supporting bodies pertaining to Islamic banking can be found here and it is also in this very region that the financial assets of Islamic banks are largely concentrated. Some of the basic concepts of Islamic banking and its history and development are discussed in the sections below.

2.3.1 Definition of Islamic banking

In the literature, one can observe that there are different views on the definition of what Islamic banking is. According to one simple definition, an Islamic bank is a monetary organization that does not deal with interest but instead employs a profit-loss sharing model (Lewis and Algaud, 2001; Al-Jarhi and Iqbal, 2001; Satkunasegaran, 2003). There are also many broad definitions that have been adopted by various authors and these often define Islamic banks based on the various values and principles on which

these banks have been established (Siddiqui, 1983; Haron, 1995; Ahmad, 2000; Siddiqui, 2001; Rosly and Bakar, 2003; Haron and Hisham, 2003; Divanna, 2006; Dusuki, 2008). An example of a very articulate definition of Islamic banks is that it is "a deposit-taking banking institution, whose scope of activities includes all currently known banking activities, excluding borrowing and lending on the basis of interest" (Al-Jarhi and Iqbal, 2001).

Islamic banks operate in accordance with Shariah principles and therefore, the Shariah board plays an integral part in any Islamic bank (Anas and Mounira, 2009). The function of this board is to ensure that the given Islamic bank complies with the Shariah rules and principles according to the specific Fatwa (a religious opinion that concerns the Islamic law and which is issued by an Islamic scholar), rulings and guidelines in all its various transactions, contracts, products and applications (Alsayyed, 2009). The Shariah board consists of some of the most respected contemporary scholars of Shariah law and the opinions of the board are expressed in the form of various Fatwas (Divanna, 2006; Anas and Mounira, 2009).

Three primary functions of a Shariah board are: first the provision of necessary advice to Islamic banks. Second the supervision and auditing of transactional procedures within an Islamic bank and the third the supervision and active participation in the creation of innovative Shariah compliant investment and financial products and services (Anas and Mounira, 2009).

2.3.2 The History of Islamic Banks

The first ever branch of a commercial bank to open in a Muslim country was that of Barclays bank in Cairo. This intervention invited criticism from banking interests which later spread to the Middle East region and the Indian sub-continent (IFSB 2007b). Between the 1930s and the 1950s, Islamic economists discussed prohibiting non-Shariah banking interests and came up with the proposal of offering an alternative in the form of '*mudharaba'* (profit sharing). They subsequently came up with the theoretical model of Islamic banking and finance which was implemented later with the establishment of the '*Mitghamr'* Saving Association in Egypt between 1963-1967 (Iqbal and Molyneux 2005) and the establishment of a saving institution in Malaysia in 1962, for Muslims who wished to go on pilgrimage to Mecca (known as '*Tabung Haji')* (IFSB 2007b)

Following the establishment of the Nasser Social Bank in Egypt in 1971, the Dubai Islamic bank in UAE in 1975, the Kuwait Finance House in 1977 and the Bahrain Islamic Bank in 1978, a number of new Islamic banks were established. These banks employed Shariah compliant services even during trade financing with European banks while importing goods from Europe (IFSB 2007b).

With a further increase in the number of Islamic banks in the 1980s, Islamic nations such as Iran, Sudan and Pakistan expressed their desire to transform the entire financial systems within their countries into Shariah compliant systems (Iqbal and Molyneux 2005). Around this same time, there was a also call for strengthening of regulations and supervision of Islamic banks by governors and monetary authorities of various countries and the International Monetary Fund (IMF) published articles and working papers on Islamic banking. By the mid-1980s, non-banking Islamic financial institutions emerged in support of the existing Islamic banks.

During the 1990s, conventional banks and large international entities also started operations of Islamic banking windows and the Dow Jones and Financial Times Islamic Indices were launched in that same period. Rising issues related to Islamic banking included systemic concerns, rules, supervision and public policy interest in some countries were presented in this period (IFSB 2007b).

2.3.3 Comparison between Islamic banks and Conventional banks

Despite the fact that Islamic banks provide banking products and services like conventional banks, they are distinctly different from any kind of conventional bank.

The customers of an Islamic bank are effectively business partners of the bank who jointly bear the risk and profits of the bank depending on their type of transaction. While there are different forms of profit and loss sharing associated with the various Islamic banking products available, the bigger picture is that the risks as well as gains are shared by both the bank and its customers in this system of banking.

There are several characteristics that differentiate Islamic banks from conventional banks and these are listed in detail below (Hassan et al., 2007):

1. Islamic banks are mandated to implement Shariah law principles and all services and products associated with Islamic banks should implement the principles of '*Halal'* and '*Haram'* (principles that determine what is permitted and what is prohibited in Islam)
2. While conventional banks function on the primary principle of giving or receiving interest, Islamic banks were established to eliminate all forms of

interest in banking products and services. Therefore, under no circumstances can an Islamic bank give or receive interest either directly or indirectly.

3. Islamic banks have a regulatory and supervisory authority in a Shariah board and an Islamic bank cannot be established without the establishment of a Shariah board. The Shariah board not only reviews all the products and services and contracts of an Islamic bank but is also the ultimate decision making authority for the bank. Any board ruling is deemed compulsory and must be complied with.
4. Islamic banks follow a practice of collecting 'Zakat' (a process where a certain amount of property or money is collected from the sufficiently endowed and then given to needy people). This is collected from the profits they generate and from their client accounts provided that it is agreed beforehand with the respective client. The 'Zakat' collected will be distributed to the poor or needy people in the society.
5. Islamic banks also operate on the rule that 'riba' (interest, as it is referred to in Islam) is prohibited while trade is permitted.
6. Arguably, Islamic banks offer more value than commercial banks because they have features of both a commercial and investment bank. While a conventional bank only finances an economic project without directly being involved in it by itself, an Islamic bank, through its products and services, can get involved directly in an economic project and hold a direct stake in such projects. Islamic banks can also get involved through direct investments in societal projects such as industrial, agricultural and commercial projects.
7. While conventional banks deal in loans and credits but cannot trade in the economy, Islamic banks, by principle, do not lend loans on interest since they are prohibited from dealing with interests. However, as an alternative to giving interests on loans, Islamic banks use profit sharing contracts which mean that these banks also take part in projects they finance.
8. Unlike conventional banks that do not deal in commodities since it is not within their scope of operations, Islamic banks can both buy and sell commodities via either internal or external trade.
9. Conventional banks use their liquidity mostly in providing loans to customers or commercial establishments whereas Islamic banks use their liquidity for funding joint venture projects with their clients.
10. When Islamic banks finance a particular project, they care about the success of the project because they have a stake in the project and because the project's

outcome directly impacts their investment. On the other hand, when a conventional bank finances a given project, their returns are assured irrespective of the success of the project and hence they need not be bothered about the outcome. Conventional banks are assured of returns either from the entrepreneur or from insurance firms, whereas, Islamic banks cannot insure their investment in line with Shariah principles and solely depend on the success of a project to receive returns on their investment.

11. Conventional banks need to evaluate the ability of the debtors or entrepreneurs to pay back loans and interest in line with the agreed timetable. Islamic banks, instead, focus on the potential productivity of a given project and its contribution to the economy. Since Islamic banks will only gain from investing in a project if the project can culminate in a successful outcome, they tend to finance only such projects which are likely to succeed.
12. Conventional banks, in general, do not have many restrictions on what areas of trade they can finance. On the other hand, Islamic banks are strictly forbidden from investing in certain areas of trade irrespective of their potential profitability in order to abide with Shariah principles. Therefore, Islamic banks cannot finance alcohol factories, pork production or trade, pornography or gambling activities since all these are prohibited by the Shariah law. Furthermore, Islamic banks are also prohibited from dealing with any activity that is deemed harmful to society without exception.
13. Conventional banks are obliged to provide a fixed amount of profit on fixed deposits of customers but Islamic banks neither guarantee a profit nor provide a guarantee on even the principal amount for customer deposits. Islamic banks share a partnership based relation with customers and will provide a profit on the deposits of customers only when the related business venture yields a profit.
14. Unlike conventional banks that often provide overdraft facilities for customers, Islamic banks do not provide any overdraft facility because providing an overdraft is against Shariah law.
15. In addition to providing banking products and services, Islamic banks also have a social and cultural function in society and they are obliged to deal with their customers using good moral standards.
16. Lastly, while Islamic banks are forbidden from providing loans on interest, they still offer ‘Qard al hassn’ which is an interest-free loan to the poor and needy people in the society.

2.4 The Arab spring and its relevance

The recent period during which there was a string of protests and demonstrations across the Middle East and North Africa has been termed as the "Arab Spring''. There were many reasons that had led to these uprisings including reasons such as dictatorship or absolute monarchy within these countries, rampant political corruption, human rights violations, unemployment, economic decline and absolute poverty in some cases. The rising percentage of educated but dissatisfied youth within the populations of these countries has also been attributed as a factor for these uprisings (Jamoul, 2011).

It is expected that once the dust from these revolutions settles, the real struggle for change in the Arab world will begin. Once the existing emergency laws are relaxed, constitutions are redrafted and elections are held, the banking systems in the Middle East will need to address the necessary demands that were brought forth via the Arab Spring. Nevertheless, it seems that the turmoil in the markets due to the Arab Spring had a positive impact on government spending policies and in the widening of credit spreads in these markets and this has benefited banking operations and profitability in the short run.

However, this increased spending by governments also has a potential challenge ahead considering that there are a number of large sovereign debt obligations that will mature between 2013 and 2015 and this, in turn, will require more bond and loan refinancing. Given that European banks face a $153 Billion capital shortfall according to the European Banking Authority, European banks will be unlikely to provide the necessary finance needed. According to Sammut (2012), rather than European banks, it will be the Gulf oil producers or China who would be more likely to invest in this region.

According to Katie Sumpton (2012), Principal at Booz and Company, there has been a dramatic shift in the financial landscape in the aftermath of the Arab spring and there are significant openings arising in the financial sector in countries like Libya and Iraq due to key trends such as the importance of entrepreneurship as a means to employment, growth in Shariah compliant (Islamic) banking and large scale development programs. This in turn is also forcing leaders to rethink the traditional ways of conducting business.

While there has been widespread opinion on the sociopolitical implications and the 'Islamisation effects' of the Arab Spring, far less attention has been given to the potential effects of the Arab spring on the economies of the Arab states and whether any further emphasis on Islamic values by these states in the regulation of the market and commercial activities could lead to a rise in Islamic banking. An interesting fact pertaining to Islamic banking is that after the Arab Spring, Islamic banking is gaining appeal even in those Muslim – majority countries where the authorities had forbidden this kind of banking solely on ideological grounds.

2.5 Chapter summary

The objective of this chapter was to give a wide view of the banking landscape of the Middle East oil exporting countries. The first section of this chapter covered the socio-economic background and the history of the banking system in the eight Middle East oil exporting nations of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE, Iran and Iraq. This section also showed how the banking systems in each of these nations developed over a period of time and the role played by the each nation's government policies and regulations in the establishment of both foreign and domestic banks.

In the second section of this chapter, the three main characteristics of the banking system – asset size, concentration and ownership structure were evaluated for these eight nations. The asset sizes were studied by using data pertaining to the 10 largest banks in each country and this data was further scrutinized based on the operational styles of the banks which are of three types – commercial, Islamic and investment. With respect to concentration, data pertaining to the 5 largest banks in each of these countries were studied and these were also further scrutinized based on their operational style. The study revealed significant differences between the banking systems of these countries. On one hand, there was Oman with no presence of Islamic banks in the sampled data either in terms of assets or concentration and, on the other hand, there was Iran which had only Islamic banks. With respect to ownership structure, varying degrees of foreign and domestic ownership were observed in these countries which were found to be related to prevalent government policies in each country.

In the third section of this chapter, a study was done of Islamic banking which has a strong presence within these Middle East oil exporting nations. This section elaborated on what is meant by Islamic banking, the history behind its introduction,

and the various characteristics of this type of banking and how it differs from conventional banking. A key finding from this section was the strong association between Islamic banking and the principles of Shariah and how Shariah principles dictate the various practices as well as the products and services offered in Islamic banking.

The last section gave a brief coverage of the Arab spring and its effect on the Middle East region and how it has influenced and will continue to influence the banking and financial landscape in this region.

Chapter 3 LITERATURE REVIEW

This chapter reviews and explores the background perspective and importance of the relevant literature relating to the major constructs of this study which are banking efficiency studies and oil price movement studies. Therefore, this literature review chapter has been divided into two sections: the first section deals with efficiency measurement in the banking industry and the second section deals with oil price movement studies.

The first section of this chapter will explain the theory of measuring performance and the techniques which have been applied in the literature. The banking performance literature will be reviewed in order to find the best model for measuring the performance of banks. More significantly, the exogenous factors which impact the performance of banks and have been studied in the literature will be explored. As a main finding from reviewing the literature, and analysing the large number of studies, the research gap will be addressed. The influence of oil price movement on the efficiency of banks has not been studied while these exogenous factors could play a critical role in the performance of banks in oil exporting countries.

In the second section of this chapter, the history of the oil price movement over 150 years will be reviewed briefly. In order to further explore the research gap, this section reviews the literature from the oil price movement perspective. A large number of studies were reviewed to investigate the relationship between oil price and various economic indicators and financial systems in this section.

These empirical studies examine the relationship between oil price movements and different economic indicators (eg. GDP, interest rate, inflation, interest rate, unemployment and exchange rate) and financial systems (eg. monetary policy, stock market). The significant outcome of the review in this section will emphasize the gap which was discovered in the first section.

3.1 Efficiency Measurement in Banking Industry Literature

The first section primarily introduces an accounting-based and an economic-based perspective of performance measurement. Cost efficiency, profit efficiency and technical efficiency will be discussed briefly, followed by explanation of the

methodology of frontier efficiency measurement which is divided into parametric and non-parametric models. Each model with its sub-divisions will be discussed and comparison between the two models will be made. A review of the leading papers in frontier efficiency measurement will be presented in this chapter followed by the main path to parametric and non-parametric efficiency measurement. The next step in the literature review of this section will be narrowed to the studies related to the performance of banks in countries all over the world been published after 2000 using Elsevier, Emerald, Science Direct and ABI Inform databases. In total, 138 papers have been reviewed to identify the best selection of inputs and outputs and the impact of different indigenous and exogenous factors on the performance of banks.

3.1.1 Performance Measurement

Performance measurement is an essential condition for performance improvement (Brownie et al., 1997). However, performance measurement can be observed from two different angles. Firstly, the accounting-based perspective, which is widely used in the literature, measures the performance of an organization by using comprehensive information from financial statements, financial indexes like return of assets (ROA), return on Equity (ROE), return on investment (ROI) and return on sales, of which the first two are the most used ones. Secondly, an economic-based perspective which measures the distance of each unit in a sample of observation from the ideal frontier with respect to the maximization of output, the maximization of profits or the minimization of costs (Olson & Zoubi, 2011). The economic-based perspective, which in the literature has been referred to as “efficiency”, is determined through the analysis of the relation between outputs and inputs of a certain production unit.

3.1.2 Measurement of Efficiency

Efficiency measurement is one perspective of firm performance. To measure efficiency the organization must be compared to a best practice organization, in other words, it must be benchmarked. The benchmark organization is, according to the sample, the most efficient organization. Athanassopoulos (1998) stated that to make results comparable, homogeneous groups of Decision-Making Units (DMUs) must be established.

Efficiency can be viewed from different aspects: *Cost efficiency* which means how effectively a firm uses its resources in producing services and products; *Profit efficiency* which examines how effectively a firm generates income from these services and products or *Technical efficiency* that measures how much actual inputs of a firm approaches its maximum production.

3.1.3 Frontier Efficiency Measurement Review

Efficiency measurement originates from the definition of efficiency of DMU by Koopmans (1951) and Debreu (1951).They stated that DMU is efficient when producing one more unit of any output results in using more of some inputs or producing less of some outputs. For the purpose of measuring the radial distance of DMU from the frontier, Debreu (1951) introduced output-expanding direction distance function while input-conserving direction distance function was introduced by Shepherd (1956). Farrell (1957) presented efficiency measure as the product of allocated efficiency and technical efficiency. Using his idea, frontier approaches have been developed in two groups; parametric and non-parametric approaches. Based on these two approaches numerous models with different applications to a variety of industries were developed. Depending on the availability of data and the reason for efficiency measurement, scholars choose different models for their research. The following table illustrates the methods developed according to these two approaches:

Table 3-1) Production frontier approaches

Production Frontier			
Parametric Frontier		Non-parametric Frontier	
Deterministic	Stochastic	Deterministic	Stochastic
OLS, COLS, MOLS	SFA,TFA,DFA Stochastic Frontier	DEA , FDH, Robust FDH/DEA	Stochastic DEA, Stoned

Ref (Emrouznejad and witte, 2010)

3.1.3.1 Parametric approaches

The aim under the parametric approach is to build econometric models base on regression analysis to estimate efficiency scores. The production function and production frontier can be set up at a given level of inputs and technical efficiency score can be measured as the distance of DMU's actual outputs from the estimated production frontier.

In order to introduce a parametric approach, suppose a DMU_j *(j=1, 2…., n)* is producing output y_j from m inputs, x_{ij} *(i= 1, 2,…,m).* The production function of each DMU can be written as follows:

$$\boldsymbol{y_j = f(x_{ij}, \beta) \times TE_j} \qquad \textbf{Equation 3-1}$$

Where

- y_j is output produced by $j^{th}\ DMU_J$, $(J = 1,2,..n)$
- x_{ij} is a vector of m inputs used by DMU_j
- $f(x_{ij}, \beta)$ is the production frontier
- β is a vector of technology parameters
- TE_j is the technical efficiency of DMU_J

Technical efficiency will be equal to one, if one is produced on the frontier, and less than one, if it produces less than maximum feasible output. This difference between actual output and maximum feasible output is called "technical inefficiency". Therefore, the output technical efficiency TE_j is

$$\boldsymbol{TE_j(x, y) = \frac{y_j}{f(x_{ij}, \beta)}} \qquad \textbf{Equation 3-2}$$

Equation (3.1) and (3.2) do not consider the fact that random shocks (external noise such as error) may affect outputs. In order to capture the effect of external noise on each DMU, the denominator of equation (3.2) can be broken into two parts; a common part to all DMUs which is the deterministic part $f(x_{ij}, \beta)$ and $\exp(v_j)$ which accounts for random shocks.

The product of these two elements is called the "stochastic production frontier".

$$\boldsymbol{y_j = f(x_{ij}, \beta) \times exp(v_j) \times TE_j} \qquad \textbf{Equation 3-3}$$

Thus, equation (3.2) can be rewritten as follows

$$\boldsymbol{TE_j(x, y) = \frac{y_j}{f(x_{ij}, \beta) \times exp(v_j)}} \qquad \textbf{Equation 3-4}$$

Therefore, technical efficiency being measured by parametric approach can be estimated under the deterministic production frontier approach (equation 3.1 and 3.2) or the stochastic production frontier approach (equation 3.3 and 3.4).

Under the deterministic approach three models have been introduced: ordinary least square (OLS), corrected ordinary least square (COLS) and modified ordinary least square (MOLS) (Cazals, *et al.*, 2008). Three other approaches which exist under the Stochastic approach are Stochastic frontier approach (SFA), Distribution Free Approach (DFA) and Thick Frontier Approach (TFA) which will be discussed here in general terms.

Stochastic Frontier Approach was introduced by Aigner et al.(1997), Meeusen and Van den Broeck (1997)_simultaneously. This approach which is the most common parametric approach allows for random error. Nevertheless, SFA demands more assumptions related to the form of frontier and errors (Berger and Humphrey, 1991; Mester, 1996).

Thick Frontier Approach which is the least used approach measures the overall efficiency level instead of measuring each unit's efficiency level individually. This approach, which was introduced by Berger and Humphrey (1991, 1992), specifies a functional form and assumes that the deviation of predicted performance value from actual value is caused by X-inefficiency or random error. If the deviation is *within* the lowest and highest performance quartiles of all DMUs, it is assumed as random error while the deviation *between* the lowest and highest quartiles is considered as inefficiencies (Berger & Humphrey, 1997). Although applying Tick Frontier requires less statistical assumptions, this approach is impractical since it provides inefficiency for overall DMUs and not for each DMU individually (Berger & Humphrey, 1997; De Young, 1997).

Distribution Free Approach was presented by Berger (1993) and like SFA specifies a functional form of frontier. However, DFA separates distribution of inefficiency and random error. Under this approach, the average efficiency of each DMU is constant over time while random error tends to average out to zero over time.

3.1.3.2 Non-Parametric approaches

The non-parametric approach is based on linear programming and no functional form is specified for it. A piece-wise linear combination of best-practice units forms the frontier and the performance of all the DMUs will be evaluated in terms of the best practice units. The units positioned on the frontier are efficient units and those that do not lie on the frontier are considered as inefficient units, and an inefficiency score will be calculated for each of them (Farrell, 1957).

A non-parametric approach consists of two groups, deterministic models and stochastic models. Under the first group, the models assume that all observations belong to the production set, which makes them sensitive to outlying observations. Under second group, Stochastic models allow for noise in the data and capture the noise by an error term. However, sometimes it is difficult to distinguish the noise from inefficiency (Emrouznejad and witte, 2010). Data Envelopment Analysis (DEA) has been the most widely used non-parametric model in empirical efficiency studies.

Data Envelopment Analysis followed work of Farrell (1978) was developed by Charnes et al. (1978). They introduced a performance measure for DMUs which evaluates the relative efficiencies of all DMUs based on a mathematical programming model. This model is called Data Envelopment Analysis.

Charnes et al (1978) proposed the ratio form of technical efficiency. In a multy-input and a multy-output form efficiency is measured as

$$\boldsymbol{efficiency = \frac{outputs}{inputs}} \qquad \textbf{Equation 3-5}$$

DEA has undergone many developments and modifications since the early concept proposed by Charnes et al (1978). The concept of Return to Scale was introduced by Banker et al (1984)which is grouped as Constant Return to Scale (CRS) and Variable Return to Scale (VRS). Another modification of the DEA model is an orientation approach which was developed by Coelli et al. (2005) and which estimates efficiency under two categories: input-orientation and output-orientation. These developments will be discussed in the following two sections.

3.1.3.3 Constant versus variable returns to scale

The CRS assumption is used in DEA when banks are operating at an optimal scale. Imperfect competition, government regulations and constraints on finance are some of the main reasons why organizations may not operate at optimal scale (Coelli et al., 2005). In the case of the banking sector, banking regulation and supervision, concentration, market structure and other real environmental factors may prevent banks from operating at an optimal scale (Debnath and Shankar, 2008; Wheelock and Whilson, 1999; McAllister and Mc Manus ,1993). Avkiran (1999) and Noulas (1997) believe that CRS is more appropriate than VRS for studying banking sector efficiency. The reason, they claim, is that VRS allows the comparison between small and large banks. On the other hand, in variable return to scale (VRS), there is an assumption each

unit is benchmarked against other units of a similar size while under CRS there is an assumption that each unit is compared with all of the other units.

Fethi and Pasiouras (2010) stated that, in the most recent papers, the VRS assumption has been used rather than CRS. Chortareas et al. (2013), Matthews (2013) and shyu (2013) are the other researchers who applied VRS for measuring efficiency. However, in many studies both assumptions have been used to report the results (e.g. Canhoto and Dermine, 2003; Casu and Molyneux, 2003; Yao et al. (2008); Sensarma (2006); Hermes and Nhung (2010); Figueira and Nellis (2009).

3.1.3.4 Input versus output orientation

In studying the efficiency of banks at the country level, data policy makers have more control over outputs rather than inputs and they focus more on the demand for banks' products rather than controlling inputs (Emrouznejad and Anouse, 2010). However, at branch level it seems that bank managers have less control over outputs (e.g. loans, income, etc.) rather than inputs (e.g. personnel, expenses). The results obtained under CRS assumptions are the same for both input and output orientations. Therefore, the concept of orientation only makes a difference when applying VRS assumptions. Many studies which use VRS assumptions have reported the results by applying both orientations (Gonzalez, 2009; Figueira and Nellis, 2009; Casu and Molyneux ,2003). Coelli et al. (2005) believes that the selection of a proper orientation is not as crucial as in the case of econometric assumptions.

3.1.4 Specification of Inputs and Outputs

In this section the answer to the question,"which approach is the more suitable approach for selecting the inputs and outputs?", will be discussed.

Input and output can be defined regarding the production characteristics of the industry and no explicit definition exists for them (Bauer et al., 1993). According to Berger and Humphrey (1997) the way we define output may actually influence the results. However, the definition of input and output in service industries like financial firms can be both more difficult and have more variety. Girardone et al. (2004) stated that introducing a comprehensive definition for input and output in the production function of banks is impossible because of the diversity of products.

There are five commonly used approaches in literature for defining input and output in which each definition represents a particular set of banking concepts: the Production approach, the Value added approach, the Intermediation approach, the Profit approach and the Operating approach. In the following paragraphs the three most commonly used of them are discussed.

Production approach is one of the two most widely used approaches for the measurement of financial services. This approach dates back to the early 1980s and follows the traditional theory of microeconomics banks' production (Bauer et al., 1993; Favero and Papi, 1995; Resti, 1997a). Under this approach banks use labour and capital to provide different types of loan and deposit accounts to account holders. Thus, banks employ resources to provide customers and depositors with financial services such as transactions and documentation (credit reports, insurance services, cheques and loan application, etc).

Value-added approach can be considered as a modification of the production approach (Avkiran, 2006). Under this approach loans and deposits are measured by the dollar and classified as outputs while labour, physical capital and purchased funds are classified as inputs (Berger and Humphrey, 1993).

Intermediation approach in the literature is introduced by Sealey and Lindey (1977). The Intermediation approach consists of a combination of the financial intermediation theory and the microeconomics of bank production. Under this approach banks provides financial services for account holders and are considered as intermediaries between liability holders and receivers of the bank funds, in other word banks are mediators between the demand for and the supply of funds (Mester , 1996).

The other approaches such as the asset approach used by Berger and Humphrey (1993), the Profit or user-cost approach introduced by Hancock (1986) and the risk management approaches developed by Mester (1996) are very rarely used. Table 3.2 lists a number of most cited studies in the period 2000-2013 which use the above mentioned approaches in defining inputs and outputs which will help to answer the above mentioned question.

Table 3-2) A survey of the most common approaches used in DEA

Study	countries	Period	approach
Al-Jarrah and Molyneux, 2003	Jordan, Bahrain, Saudi Arabia, Egypt	1992-2000	intermediation
Arrif and Can	China	1995-2004	Intermediation
Ataullah & Lee, 2006	India	1992-1998	Intermediation
Avkiran, 2009	Australian and New Zealand	1996-2003	Intermediation
Beccalli et al., 2006	France, Germany, Italy and Spain	1999-2000	Intermediation
Canhoto and Dermine, 2003	Portugal	1990-1995	Intermediation
Casu & Molyneux, 2003	Italia	1996-1999	Intermediation
Casu & Molyneux, 2003	USA	1990-1995	intermediation
Casu and Girardone, 2004	Italia	1996-1999	Intermediation
Casu and Girardone, 2009	France, Germany, Italy, Spain and the United Kingdom	2000-2005	Intermediation
Chen & Yeh, 2000	Taiwan	1996	Intermediation
Chen et al. 2005	China	1993-2000	Intermediation
Chortareas et.al., 2012	27 European countries	2001-2009	Intermediation
Chortareas et.al., 2013	22 EU countries over	2000-2008	Intermediation
Delis, 2009	10 newly acceded EU	1994-2005	Intermediation
Dietsch and Lozano-Vivas, 2000	France and Spain	1988-1992	intermediation
Drake et al. 2003	Hong Kong	1995-2001	Intermediation
Drake et al. 2007	Japan	2001	Intermediation, Profit, Production
Drake et al., 2006	Hong Kong	2006	Intermediation, Profit
Drake et al., 2006	Hong Kong	2006	intermediation
Emrouznejad and Al Anouze	GCC countries	2009	Intermediation
Figueira et al.,2011	Latin American banks	2001	Intermediation
Gardener et al., 2011	Indonesia, Malaysia, the Philippines, Thailand, and Vietnam	1998-2004	Intermediation, Production
Gonzalez, 2009	69 countries	1996-2002	Intermediation
Hall et al., 2012	Hong Kong	2001-2006	Intermediation Production
Hauner, 2005	Austrian and German banks	1995-1999	Intermediation
Hermesa and Nhung , 2010	Ten emerging economies	1991-2000	Intermediation
Kenjegalieva & Sipmer, 2011	Central and Eastern European banks	1998-2003	Intermediation
Lozano-Vivas et al., 2002	10 European Banks	1993	Value -added

Study	countries	Period	approach
Mahesh & Rajeev, 2008	India	1992-1999	Production
Mostafa, 2009	Arab banks in Middle East	2005	intermediation
Pancurova & Lyosca, 2013	Central and Eastern European Countries	2005-2008	Intermediation
Pasiouras, 2008	95 countries	2003	Intermediation
Pasiourasa et al., 2008	Greece	2001-2006	Profit
Pasiourasa et al., 2008	Greece	2001-2006	Value -added
Saeed Al-Muharrami, 2007	GCC countries	1993-2002	Intermediation
Sufian & Abdul Majid 2007	Malaysia	2002-2003	Intermediation
Sufian, 2009	Malaysa, Thainlan	1992-2003	Intermediation
Sufian, 2009 (b)	Thailand, Malaysia	1992-2003	Value -added, Intermediation, Operating
Sufian, 2009(a)	Malaysia	1997	Value -added, Intermediation, Operating
Thoraneenitiyan &Avkiran, 2009	Indonesia, South Korea, Malaysia and Thailand	1997-2001	Intermediation
Thoraneenitiyan and Avkiran, 2009	Indonesia, SouthKorea, Thailand,Malaysia and Philippine	1997-2001	Intermediation
Yao et al, 2007	China	1995-2001	Intermediation
Yao et al, 2008	China	1998-2005	Intermediation

Source: Researcher for purpose of this study

As it is illustrated in Table (3.2), 44 studies for the period 2010-2013 using Elsevier, Emerald, Science Direct and ABI Inform databases were reviewed to investigate the proper approach for selecting inputs and outputs. Few of these studies used a mixed approach, which was a combination of more than one approach. These studies compared the efficiency scores obtained from different approaches with each other. For instance Drake et.al (2009) conclude that intermediation approach nearly always produces the highest relative efficiency scores compared to the production and profit approach, while Tortosa-Ausina (2002) found the reverse. Out of 44 studies, four studies used the value-added approach; three studies used the profit approach and three used the production approach. Two studies chose the operating approach while the remaining which is 35 studies applied the intermediation approach for selecting inputs and outputs. Figure (3.2) illustrates the three most commonly used approaches in bank efficiency literature for selecting inputs and outputs.

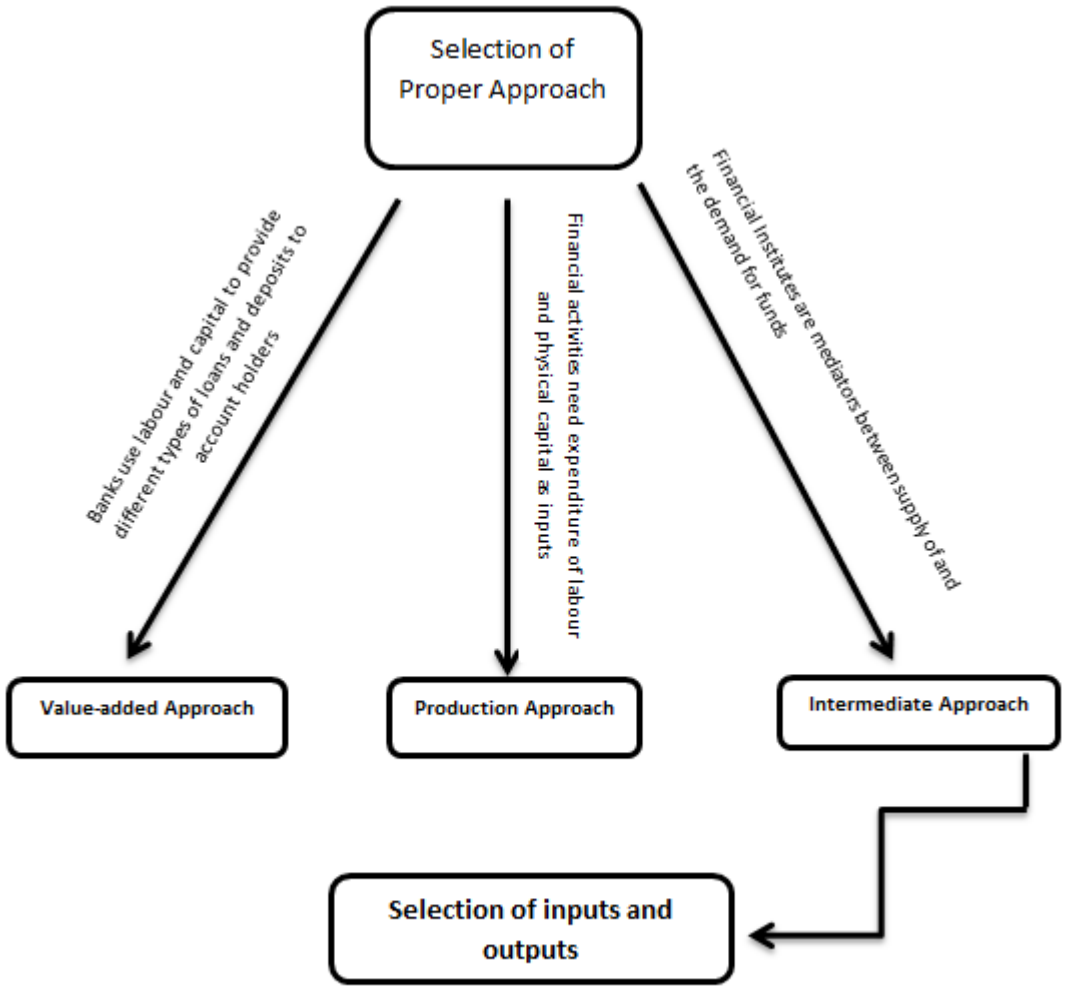


Figure 3-1) Proper approach to select inputs and outputs

As Figure (3.2) shows the proper approach to select inputs and outputs in this research is the Intermediation approach. The answer to the above question is not only supported by the literature review but also by Elyasiani and Mehdian (1990) who stated that the quality of data is higher from the intermediation approach. Moreover data necessary to implement this approach is easily available. Under the intermediation approach, deposit is considered as an input which is more convincing than being considered as an output (under the production approach). Another advantage of the intermediation approach compared to the other approaches is that money value is used as a measure of outputs (for loans, other earning assets and non-interest income, etc.) according to the intermediation approach and the necessary information is generally available from a bank's financial statements, or from other accessible sources.

3.1.5 Selections of inputs and outputs

After choosing the Intermediation approach for selecting inputs and outputs one should find out what inputs and outputs should be chosen under this approach. Table (3.3) which summarises previous research conducted using different inputs and outputs in order to evaluate bank efficiency help to answer the question: "*What inputs and outputs should be selected for the Intermediation approach?"*

Table 3-3) A survey of the studies used different inputs and outputs under intermediation approach*

Study	countries	input	output
Akmal and Saleem, 2008	Pakistan	Operating expenses, interest expenses, fixed assets	Net loans, liquid assets, deposits
Al-Jarrah and Molyneux, 2003	Jordan, Bahrain, Saudi Arabia, Egypt	Deposit, Labour, Physical Capital	Total costumer loans, off-balanced sheet
Arrif and Can, 2005	China	Total loanable funds, number of employees and physical capital	Total loans and investments
Ataullah & Lee, 2006	India	Interest expenses and operating expenses	Loans and advances, investment , Interest income and operating income
Avkiran, 2009	Australian and New Zealand	Interest expense and non-interest expense,	Interest income and non-interest income
Banker et al. ,2010		Interest expense and other operating expense	Interest revenue and other operating revenue
Barros et al. ,2012	Japan	The number of full time employees, total deposits and physical capital	Total loans
Barros et al., 2011	China	Number of employees, deposits, and total assets	Loans, and securities
Bos et al,2009	USA and 17 European countries	Labour, financial capital, Physical capital	Loans, Investments and Off-balanced sheet activities

Study	countries	input	output
Canhoto and Dermine, 2003	Portugal	Number of employees and physical capital	Loans, deposits, securities, interbank assets/liabilities
Casu & Girardone, 2009	EU-15 area	Deposit ,labour, physical capital	Total loans and other earning assets
Casu & Molyneux, 2003	Italia	Labour, deposits and Capital	Total loans and other earning asset
Chen & Yeh, 2000	Taiwan	Asset, Deposit and Staff	Provision of loan services, portfolio investment and non-interest income
Chen et al. 2005	China	Interest expenses, non-interest expenses and Capital	Loans, deposits and non-interest income
Chortareas et al. ,2012	22 EU countries	Personnel expenses, total fixed assets, and deposits	Total loans and other earning asset
Drake et al. 2007	Japan	Total deposit, total operating income, total provision	Total other earning assets, net commission, fees and trading income and total loans
Emrouznejad and Al Anouze, 2010	PGCC countries	Total asset, deposit and capital	Loans and net profit
Guillen, 2009	USA	Interest expenses, Non-interest expenses, Salary expenses, Premises and fixed assets and Purchase funds (large deposits)	Interest and Non-interest incomes
Isik and Hassan, 2003	Turkey	Labor, Physical Capital, Loanable fund	Loans, off-balance sheet activities, other earning assets

Study	countries	input	output
J.B. Hall et al. ,2012	Hong Kong	Total operating expenses, total fixed assets, total provisions	Total loans, other earning assets, net commission, fee and trading income, other operating income
Lozano-Vivas et al., 2002	10 European Banks	Personnel expenses and non-interest expenses	Loans, deposits and other earning asset
Mahesh & Rajeev, 2008	India	Deposit, Borrowing, Labour, Fixed asset	Interest margin, Non-interest income, Credits and Investment
Mostafa, 2009	Arab banks in Middle East	Asset and equity	Net profit, return on asset and return on equity
Saeed Al-Muharrami, 2007	PGCC countries	Fixed assets, deposit, equity and labour	Total loans, other operating incomes, other earning assets, off balance sheet activities
San et al ,2011	Malaysia	total deposits of domestic banks, total deposits of foreign banks, fixed assets of domestic banks, fixed assets of foreign banks	the total loans of domestic banks, the total loans of foreign banks, the total investments of domestic banks, the total investments of foreign banks
Staub et al. ,2010	Brazil	interest expenses, operational expenses ,personnel expenses	Total loans net of provision loans, investment, and deposits
Sufian & Abdul Majid 2007	Malaysia	Interest Income, Non-interest Income	Personal Expenses, Non-interest Expenses
Sufian, 2009 (b)	Thailand, Malaysia	Labour, Capital, Interest Expense	Deposit, Loans, Investment
Sufian, 2009(a)	Malaysia	Labour, Capital, Interest Expense	Deposit, Loans, Investment
Tecles & Tabak, 2010	Brazil	deposits, number of employees, fixed assets and equity	investments, loans and advances and other non-interest fee based incomes

Study	countries	input	output
Thoraneenitiyan and Avkiran, 2009	Indonesia, SouthKorea, Thailand, Malaysia and Philippine	deposit, Labour capital and physical capital	loans, investment plus other earning assets, off-balance sheet activities and fee income
Yao et al, 2007	China	fixed assets, deposit, equity and labour	pre-tax profit, loans
Zhang et al. ,2011	China	interest expenses, non-interest expenses (operating expenses), and net value of fixed assets	total loans, total deposits, other earning assets, and non-interest income, net interest income and non-interest income
Zhao and Murinde ,2011	Nigeria	Interest expense, Non-interest expense and Financial capital	Loans, Deposits

* No Branch-level studies

Source: Researcher for the purpose of tis study

Table (3.3) reviews 34 papers for the period 2000-2013 using Elsevier, Emerald, Science Direct and ABI Inform databases to investigate what is the selection for input and output vectors. The studies reviewed in Table (3.3) with input and outputs used will be presented by categorizing them in Table (3.4).

Table 3-4) Categorized inputs and outputs

Input	Frequency	Out put	Frequency
Asset		**Liabilities**	
Fixed asset	12	Loans	29
Total asset	8	**Deposit**	8
Deposit	20	**Income & Profit**	
Capital	14	Operating income	1
Physical capital	8	Interest income	5
Financial capital	9	Non-interest income	7
Expenses		Fees and trading income	3
Non-interest expenses	1	**Off-Balance Sheet activities**	4
Interest expenses	2	**Earning asset**	6
Operating expenses	1	**Investment &Credit & Security**	11
Labour		Investment	6
no. of employees	3	investment and credit	2
employees expenses	4	Securities	2
labour	8	Personnel expenses	1
Income		interest margin	1
Operating income	3	interbank asset/liabilities	1
Interest income	3	Return to asset	1
Non-interest income	5	Return to equity	1

Source: Researcher for the purpose of this study

As it can be observed in Tables (3.3) and (3.4), there is some partial agreement with respect to the inputs and outputs variables used for evaluating a bank's efficiency. In the survey around 20 applications of bank efficiency consider monetary value of deposit as an input while in eight applications deposit is used as an output.

Around five studies use interest, non-interest and profit expenses as a part of the input vector. Fixed assets and financial capital (equity) as well as other often used elements of input have been used 12 and 8 times respectively in the studies reviewed. Another variable used widely as an input vector is labour or, in some studies, number of employees or employees' expenses.

Loan is one of the most popular variables used as an output in bank efficiency studies. In the survey we did, 29 out of 34 studies used loans as an output. The other two variables that have been used as an element of the output vector in many studies are income and profit which in total account for around 16 studies in the survey.

Thus, input variables could be broadly categorized into four types: asset, deposit, capital (equity) and labour, while outputs can be broadly categorized into two: income and profit and liability.

3.1.6 Comparing parametric and non-Parametric approaches

A study of various literature sources suggest that while SFA is the most commonly used parametric model, DEA is the most commonly used non-parametric one. Nevertheless, both of the models are recommended alternatives to OLS. All the methods mentioned OLS, SFA and DEA have their own advantages as well as limitations.

While there are certain similarities between OLS and SFA, DEA is quite different from these two. This is because both the SFA and OLS are based on regression analysis that is easy to test and provide prediction models. However, these two models are characterised by low flexibility and a high dependence on specific assumptions (Anouze, 2010).

According to Thanassoulis (1993), the DEA is a more practically applicable model since there is no need to identify a functional form of the production frontier when using it and, therefore, it can deal with multiple input/output variables. Moreover, it makes more sense to use the DEA model because this model does a performance comparison using efficiency whereas regression uses the concept of averages. An additional advantage of this model is that it introduces two additional concepts of ‘inefficiency’ and ‘return to scale’. Lastly, since DEA is a boundary model, it provides more appropriate individual targets in which the outputs or inputs cannot vary independently of each other.

Even though Lovell (1993,pp.19) states that “neither approach strictly dominates the other”, considering all the afore-mentioned advantages the non-parametric DEA method has over the parametric SFA in technical efficiency analysis, the DEA method was used as the method for estimating efficiency in this thesis.

3.1.7 Adjusting for environmental variables

An important issue in developed efficiency measurement studies is considering the impact of environmental variables on efficiency. There are four approaches discussed by Coelli et al. (2005) for incorporating environmental variables in DEA applications and these are outlined below:

In the first of these approaches, put forth by Banker and Morey (1986), the environmental variables that adversely impact efficiency are ordered increasingly from the ones that impact efficiency the least to the ones that impact it the most. Following this ordering, the efficiency of a given firm is compared with that of other firms, within the sample, which have values of the environment variable lesser than or equal to the given firm. This approach ensures that any given firm is not compared with peer firms that operate in more favourable environments.

In the second approach, put forth by Charnes et al. (1981), the decision-maker needs to undertake a series of steps as follows;

(i) The samples need to be divided into sub-samples and the DEA problem needs to be solved for each sub-sample.

(ii) All observed data points then need to be projected into their prospective frontiers.

(iii) A solitary DEA then needs to be solved using the projected points.

(iv) Any difference in the mean efficiencies of the two sub-samples then has to be accessed.

According to Coelli et al. (2005), there are two common problems associated with both the methods stated above - the sample splitting reduces the comparison set and only one environmental variable can be considered in each case. These problems limit the scope of analysis for both methods.

In the third approach, environmental variables are included directly in the DEA model as non-discrete inputs (if these variables are presumed to have a positive effect on efficiency) or as non- discrete outputs (if these variables are expected to have a negative effect on efficiency). The disadvantage of this approach is that one needs to know the direction of influence of these variables beforehand – a shortcoming that is also present in the first method discussed. However, as an alternative to this method, environment variables can also be introduced as non-discrete neutral variables using an equality form. Pastor (1999) and Lozano-Vivas et al. (2001, 2002) showed recent applications of both of these methods from this third approach in banking.

The fourth approach discussed by Coelli et al. (2005) is a two staged approach. While the first stage involves a DEA model with traditional inputs and outputs, in the second

stage, the efficiency scores obtained are regressed on the environment variables. This particular approach is commonly used in the banking literature and has a number of applications.

Pastor (2002), Drake et al. (2006), Avkiran (2009b) and Thoraneenitiyan and Avkiran (2009) use a multi-stage DEA model for adjusting banking efficiency scores for risk and/or external environmental factors. Here, an estimation of a DEA model with traditional inputs and outputs is made by these researchers first. Following this, the effect of the operating environment is quantified using the slacks from the DEA model and then the initial dataset inputs and/or outputs are adjusted. In the end, the initial DEA model using the adjusted data is re-run.

After Coelli et al. (2005), C. Paradi et al. (2010) introduce a CA-DEA model to control the impact of environmental variables from a whole production process viewpoint. The result that the CA-DEA model provides efficiency estimates close to the true managerial efficiency.

3.1.8 Environmental- variables used in literature

Several studies attempt to investigate the factors that influence the efficiency of banks. Some studies examine only bank-specific factors and others examine both bank-specific attributes and environmental determinants. In this section the most interested studied environmental factors in the bank efficiency studies will be discussed.

Regulatory reform/liberalization: A significant number of studies are available that evaluate the impact of financial deregulation on the performance of banks but which do not consider the impact due to competition and risk-taking.

An example is that of Berg et al. (1993) whose observation of the performance of the Norwegian banking sector throughout the 1980s revealed that productivity declined in the pre-deregulation period for this sector but underwent rapid growth in the post-regulation period. In another study, Gilbert and Wilson (1998) studied Korean banks for the period 1980-1994 and analysed their changes in both technical efficiency and technology and found that banking reforms had resulted in improved productivity and potential output. However, Hao et al. (2001), who used data from 1985-1994 for study, concluded that there was little or no positive relationship between banking reforms and the efficiency of Korean banks.

Kumbhakar and Lozano-Vivas (2001), who studied the impact of deregulation on the performance of Spanish banks, reached the conclusion that there was only a slight improvement in banking performance as a result of regulatory reforms. On the other hand, Brissimis et al., (2008), found that reforms in the banking sector within the newly added EU countries led to a positive impact on bank efficiency but, at the same time, any effect on Total Factor of Productivity growth (TFP) occurred only towards the end stages of the reform process.

The influence of financial market reforms in 1991–1992 and 1997 on the efficiency of Pakistan banks were investigated by Bonaccorsi di Patti and Hardy in 2005 from which they concluded that there was a moderate increase in profits as a result of an increase in profit productivity, but for the second round of financial reform in 1997 they found it difficult to derive a conclusion. Denizer. et al. (2007) applied a two stage DEA to analyse the efficiency levels of a bank in Turkey covering long periods of time, 1970-1994, before and after financial liberalization. They concluded that the liberalization did not provide the anticipated efficiency gains.

In yet another study, Hermesa and Nhung (2010), with the help of data from ten emerging market countries for the period 1991-2000, scrutinised the effect of financial liberalisation on the efficiency of banks and found that empirical analysis strongly pointed towards a positive impact on banking efficiency due to financial liberalisation. Brissimis et al., (2008) stated that there could be many explanations as to why there are these kinds of discrepancies in these empirical findings. These discrepancies may be due to a lack of similar measures of performance and samples used (samples correspond to different macro-economic conditions and de-regulation policies) or it could be due to differences in other parameters like organisational form and special features of the institutions that influenced the relationship between efficiency and reforms.

Risk: Risk, in recent years, has been adopted to measure a bank's efficiency in some research studies. Because of the severe fluctuations that occur within the financial environment and because of the advent of financial instruments like derivatives many studies consider the influence of external environment risks and internal risks, and some studies use both of them in order to measure a bank’s efficiency. Cebenoyan et al. (1993), Barr et al. (1994), Elyasiani et al. (1994), Berger and DeYoung (1997) and Chang (1999), while studying banks’ efficiency, focussed on external environmental risk and applied a two-stage approach in order to analyse efficiency effects whilst

incorporating risk and economic environmental effects. While the importance of incorporating endogenous risk (internal risk) into the analysis of production and measure of banks' efficiency were shown in the studies of Hughes et al. (2000), Altunbas et al. (2000), and Girardone et al. (2004). Pastor (1999, 2002) used internal risk and external environment risk as the risk indexes in order to estimate bank efficiency but had not considered the market and operating risks for the same purpose. Chiu and Chen (2009) by categorising banks in Taiwan in period 2002-2004 into three groups, mixed banks, publicly-owned banks and privately-owned banks, concluded that the influence of external environmental risk on efficiency for the first group of banks is larger than the other two.

Ownership: There are a number of studies that compare the efficiencies of banks across different ownership types and some of these study comparisons between foreign and domestic banks while others make comparisons between state-owned and privately-owned banks. According to Havrylchyk(2006), in Poland greenfield banks were found to be more efficient than domestic banks whereas domestic banks that underwent acquisition by foreign banks were not able to successfully improve efficiency. Isik and Hassan (2003a) found that foreign banks were more efficient than private domestic banks in Turkey too. In 2008 he reported the same findings for the result of TFP (Total Factor of Productivity) growth estimates. Similarly, Sturm and Williams (2004) found that, in Australia, foreign banks were more efficient that domestic ones. Their findings support the findings of Bonin et al. (2005) who report foreign-owned banks are more cost-efficient than other banks in eleven transition countries in the period 1996-2000.

On the contrary, Ataullah and Le (2004) found that foreign banks in India and Pakistan were less efficient than domestic ones prior to the financial liberalisation of 1991-1992, though the situation was reversed after this period. According to the findings from Chen (1998), who carried out a study in Taiwan, and Mercan et al. (2003), who carried out the same study for Turkey, the efficiency of privately held banks was higher than that of state-owned banks. However, in other contrasting studies, it was found that the efficiency of private banks was lower than that of state-owned banks. These include studies by Sathye (2003) for India and Hauner (2005) for Austria and Germany. In many other studies of the efficiency of state-owned banks, it was found that such banks were less efficient than other banks (privately owned or jointly owned). For example, Garcia-Cestona and Surroca (2008) found that the Spanish banks that were controlled by insiders (managers and workers) were more efficient than those controlled by public

administration staff. Ariff and Can (2008) also found that joint-stock banks were more cost and profit efficient than state-owned banks, in China.

Bank Acquisition: A significant amount of literature that explores the characteristics of banks targeted for takeovers focus on US banks like Hannan and Pilloff (2007) in which they found out that the most US based studies either focussed on a narrow subset of banks, such as publically traded banks, or these studies had problems in identifying changes in control. Some recent papers have also examined the determinants of takeovers in Europe. According toMolyneux (2003), the main motive for banks to seek overseas expansion is to avoid regulatory, informational and other barriers. Hernando et al. (2009) after sampling mergers and acquisitions in Europe that took place between 1995 and 2000, found that while domestic deals were more likely to be motivated by cost efficiency considerations, cross-border deals were more likely to be motivated by an objective of earnings diversification.

Rezitis (2007) investigate the influence of merger and acquisition in Greek banks and found a negative relationship between technical efficiency and total factor productivity growth for mergers and acquisitions while Athanasoglou and Brissimis's (2004) research found an improvement in cost and, in particular, profit efficiency between the pre-merger period (1994–1997) and the post-merger one (2000–2002) in Greek banks as a result of merger and acquisitions.

Competition: In most industries, the presence of competition is viewed in a positive light. This is because the existence of competition paves way for better efficiency within an industry and it stimulates innovation. Competition also improves the quality of provisioning and eventually helps in making the respective industry internationally more competitive.

The above mentioned points are the reasons for which any government, especially those in that of developed countries and emerging market countries, has in the recent past engaged in introducing reforms in the financial sector that were previously never undertaken. However, there is a certain paradox here when it comes to the relationship between the performance of the banking sector and competition within this sector. According to researchers, the relationship in this case is not as simple as observed generally (for other industries) and it would be naive to unquestioningly believe that the existence of competition in this industry generally has a positive impact (Claessens and Laeven, 2004).

The most commonly used argument to justify that competition leads to better performance is based on the supposition that wherever monopoly rents exist, they can be captured as either slack or inefficiency (Nickell et al., 1997). A parallel can be drawn between this idea of equating inefficiency with costs from slack management and the concept of x-efficiency. According to this concept, one can avoid waste by either using the minimum input needed for a given set of outputs or by obtaining maximum output using the available set of inputs.

In another study, Weill (2004), while investigating the relationship between X-efficiency and competition, found that there was a negative relationship between the two with respect to banking in the EU. The author regressed efficiency scores on the competition measure and independent variables that included an intermediation ratio, macro factors and a dummy variable.

Table (3.5) summarized 30 papers for the period 2000-2013 using Elsevier, Emerald, Science Direct and ABI Inform databases, which study the impact of different environmental variables on efficiency of banks by applying parametric and non-parametric techniques.

Table 3-5) A survey of studies of the impact of environmental factors in efficiency of banks

Author	Environmental variable	Sample	Methodology	Main Conclusion
Akhigbe & McNulty, 2003	Return on Asset (ROA)	USA, 1990-1996	Parametric: SFA	A significant negative relationship found between ROA and efficiency of banks
Altunbas et al. ,2000	Risk	Japanese bank, 1993-1996	Parametric: SFA	If risk is not taken into account optimal bank size tends to be overstated
Ariff and Can, 2008	Ownership	Chinese banks, 1995-2004	Parametric: SFA	Joint-stock banks were more cost and profit efficient than state-owned banks
Ataullah and Le, 2004	Ownership	Indian and Pakistan banks, 1991-1992	Non-parametric: DEA	Foreign banks were less efficient than domestic ones prior to the financial liberalisation of 1991-1992

Author	Environmental variable	Sample	Methodology	Main Conclusion
Bonin et al., 2005	Ownership	Eleven transition countries1996-2000	Non-parametric: SFA	Foreign-owned banks are more cost-efficient than other banks
Canhoto and Dermine, 2003	Bank age	Portugal, 1990-1995	Non-parametric: DEA	new banks dominate the old ones
Carbo et al, 2002	Return on equity (ROE)	12 European countries, 1989-1996	Parametric: SFA	ROE influence positively on efficiency of banks
Casu and Girardone, 2009	Competition	France, Germany, Italy, Spain and the United Kingdom, 2000-2005	Non-parametric: DEA Parametric: SFA	Increase in banks' monopoly power does not translate into a decrease in cost efficiency
Chiu and Chen, 2009	Risk	Taiwan banks, 2002 to 2004.	Non-parametric: DEA	The influence of external environmental adjustment toward the efficiency of the mixed banks is the largest, that towards publicly owned banks is next, and for privately-owned banks there is nearly no change.
Denizer. Et al., 2007	Regulatory reform/liberalization	Turkey, 1970-1994	Non-parametric: DEA	No evidence that liberalization improve efficiency
Girardone et al. (2004).	Risk	Italian banks, 1993-1996	Parametric: SFA	Inclusion of risk in the cost function seems to reduce the significance of the scale economy estimates
Hao et al. 2001	Regulatory reform/liberalization	Korean Bank, 1985-1994	Parametric: SFA	No positive relationship between banking reforms and efficiency of Korean banks
Hauner, 2005	Ownership	German and Austrian banks, 1995-1999	Non-parametric: DEA	State-owned banks are found to be more cost-efficient

Author	Environmental variable	Sample	Methodology	Main Conclusion
Havrylchyk, 2006	Ownership	Polish banks, 1997-2001	Non-parametric: DEA	Greenfield banks have achieved higher levels of efficiency than domestic banks, foreign banks that acquired domestic institutions have not succeeded in enhancing their efficiency
Havrylchyk, 2006	Return on Asset (ROA)	Polish banks, 1997-2001	Non-parametric: DEA	ROA significantly affects bank efficiency positively
Hermesa and Nhung , 2010	Regulatory reform/liberalization	Ten emerging economies, 1991-2000	Non-parametric: DEA	Strong support for the positive impact of financial liberalization programmes on bank efficiency
Isik and Hassan, 2003	Ownership	Turkish banks, 1988-1996	Non-parametric: DEA	Foreign banks are more efficient than private domestic
Isik and Hassan, 2003	Bank age	Turkey, 1988-1996	Non-parametric: DEA	Negative relation
Lozano-Vivasa & Pasiouras, 2010	Non-traditional activities	87 countries, 1999-2006	Parametric: SFA	On average, cost efficiency increases irrespective of whether we use OBS or non-interest income
Mercan et al. ,2003	Ownership	Turkish commerial baks, 1998-1999	Non-parametric: DEA	Efficiency of privately held banks was higher than that of state-owned banks
Molyneux (2003)	Acquisition	Europe between 1995 and 2000	Non-parametric: DEA	Domestic deals are more motivated by cost efficiency considerations than cross-border bank deals
Pastor et al. 2002	Return on equity (ROE)	France, Germany, Italy and Spain, 1988-1994	Parametric: SFA &DFA	A positive relationship between ROE & efficiency
Rezitis, 2007	Acquisition	Greek bank, 1993-2004	Parametric: SFA	Effects of mergers and acquisition on technical efficiency and total factor productivity growth of Greek banks are rather negative

Author	Environmental variable	Sample	Methodology	Main Conclusion
Roberta et al., 2010	Ownership	Brazilian banks, 2002-2007	Non-parametric: DEA	State-owned banks are significantly more cost efficient than foreign, private domestic and private with foreign participation
Sathye, 2003	Ownership	Indian banks, 1997-1998	Non-parametric: DEA	Efficiency of private sector commercial banks is paradoxically lower than that of public sector banks and foreign banks
Stun &Chang, 2011	Risk	Eight emerging Asian countries, 1998-2008	Parametric: SFA	Risk measures represent significant effects on both the level and variability of bank efficiency also these effects vary across countries and over time
Sturm and Williams, 2004	Ownership	Austaria banks, 1988-2001	Non-parametric: DEA Parametric: SFA	Foreign banks were more efficient that domestic ones
Sufian and Abdul Majid 2007	Return on Asset (ROA)	Malaysia, 2002-2003	Non-parametric: DEA	A positive relationship between ROE & efficiency
Weill, 2004	Competition	France, Germany, Italy, Spain, Switzerland 1992-1998	Non-parametric: DEA	Negative relationship between competition and efficiency in EU banking
Yang, 2013	Risk	Taiwanis banks, 2007-2010	Non-parametric: DEA	A considerable potential for efficiency improvement in Taiwan's banking industry, and the room for improvement of RE is even larger. Therefore, risk management is a relatively weak area in Taiwan's banking system

Source: Researcher for the purpose of this study

In Table (3.5) the summary of the papers which study the impact of different exogenous factors on the efficiency of banks is presented. Reviewing these papers guided the researcher to find the gap in the literature. In fact, no study explores the impact of oil

price movement on the efficiency of banks despite its impact on economy and financial services.

3.1.9 Selection of bank-specific and country-specific variables

In order to investigate the impact of different contextual factors on the efficiency of banks, the literature introduces the two stage DEA model. In the two-stage DEA model the result of the first stage (efficiency measure) will be regressed on the main variable to explain the relationship between performance of bank proxy and the main variable. This model will be explored by detail in chapter Four. However, along with main variable of this research, in order to control for environmental factors, contextual variables will be included in the model as well. These environmental variables will be categorized into two groups: bank-specific variables and country-specific variables.

Fourteen of the most cited cross-country efficiency studies in the period 2004-2013, which includes bank-specific and country-specific variables in the second stage of the two-stage DEA model, have been reviewed. The result of this investigation is shown in Table (3.6).

In the first group of variables, bank-specific variables, the most used variables are size, capitalization, liquidity and concentration. For concentration in the literature two definitions were found: one was the percentage of assets of the top three banks to the overall assets of the banking system of the country which was asset-based while the other definition is deposit-based. Some authors considered concentration as a bank-specific variable, like Sufian (2009) and Pancurova and Lyosca (2013) while Chortareas et el. (2013) and Figueira et al. (2009) consider it as a country-specific variable.

For second group of variables, as per illustrated in Table (3.6) in the country-specific variable group Growth Domestic Product (GDP) is the most used one followed by inflation. In literature, there are some other country-specific variables which an author based on the interested subject has included in second-stage of DEA. For instance, Chortareas et.al., (2012) includes a variable for discussing the influence of corruption or Thoraneenitiyan and Avkiran (2009) includes IMF a variable for International Monetary Fund support.

The selection of bank-specific and country-specific variables in this research will be discussed in more detail in chapter Five. Table (3.6) shows that the studies have been

reviewed to arrive at the best selection of bank-specific and country-specific variables. Table (3.6) summaries a survey of fourteen key papers, which citation information are found in Google Citation.

Table 3-6) A survey of two-stage DEA key papers

Author	***Sample***	***Bank Specific variables***	***Country-Specific variables***	***Nominated citation score (1)***
Delis and Brissimis, 2009 no. cited (125)	10 newly acceded EU, 1994-2005	EBRD index of banking sector reform, Concentration, Size	Inflation, GDP growth	25
Pasiouras and Tanna, 2010 no. cited (81)	74 countries	Index of capital requirements, a measure of the power of the supervisory agencies, an indicator of market discipline, level of restrictions on banks' activities	Inflation rate and GDP growth	20.25
Lozano-Vivas and Pasiouras, 2010 no. cited (78)	87 countries	Financial intermediation, bank equity level, and concentration	Inflation rate and GDP growth	19.5
Pasiouras, 2008 no. cited (115)	95 countries, 2003	Size, Capital, Loan activity, ROE, non-interest expenses to assets	GDP, Inflation	19.2
Gonzalez, 2009 no. cited (80)	69 countries, 1996-2002	Concentration, index for restrictiveness of entry into banking, index of bank activities which are restricted outside the credit and deposit business, ,index of market monitoring, index of the quality of institutional development	Inflation, GDP growth, ,LN(GDP)	16
Hauner, 2005 no. cited (130)	Austrian and German banks, 1995-1999	Size, Concentration, ownership, risk, structure of banking, quality of personnel	GDP	14.4

Author	***Sample***	***Bank Specific variables***	***Country-Specific variables***	***Nominated citation score (1)***
Casu and Girardone, 2009 no. cited (54)	France, Germany, Italy, Spain and the United Kingdom, 2000-2005	Capital, Size, Liquidity, ratio of total deposits to total deposits and money market funding, cash to total deposits, OBS activities to total assets	N/A	10.8
Chortareas et.al., 2012 no. cited (20)	27 European countries, 2001-2009	Capitalization, ROE, Size, Liquidity	Financial freedom, Government spending, Property rights, Freedom from corruption, Business freedom, Index of economic freedom	10
Kenjegalieva & Sipmer, 2011 no. cited (22)	Central and Eastern European banks , 1998-2003	Concentration, overhead costs, net interest margin of the banking system, average wage in the financial intermediation industry	GDP per capita, GDP deflator, Inflation, Unemployment, Corruption index	7.3
Figueira et al.,2011 no. cited (22)	Latin American banks, 2001	ownership	GDP growth, real GDP, Inflation rate, Concentration, Regulatory Quality	7.3
Sufian, 2009 no. cited (31)	Malaysa, Thainlan, 1992-2003	Capital, Size, Natural logarithm of total deposits, Liquidity, Credit Risk, Non-interest expense over total assets, ROA	Natural logarithm of GDP	6.2
Thoraneenitiyan &Avkiran, 2009 no. cited (31)	Indonesia, South Korea, Malaysia and Thailand , 1997-2001	Size, foreign bank entry , state intervention	Concentration, inter-bank interest rate, intermediation ratio , GDP per capita, IMF supports	6.2
Hermesa and Nhung , 2010 no. cited (20)	Ten emerging economies, 1991-2000	LIBER(measure of financial liberalization) ,Density of demand, Capital ,ROE, Credit Risk	GDP growth, inflation rate	5

Source: Researcher for the purpose of this study, [1]) *Nominated Citation Score* = $\frac{no.of\ cited}{no.of\ years\ available}$

Reviewing Table (3.6) bank-specific and country-specific variable vectors for this research were selected. In the following section these variables will be discussed in more detail.

Bank-specific variables

The bank specific variables included in the second stage of DEA techniques are ETA (Equity to Total Asset), LATD (Liquid Asset to Deposit), LLRTL (Loan Loss Reserve to total loans), and LNTA (Ln(total assets)). In following section these variables are defined.

Capitalization: To investigate the relationship between efficiency and the bank capitalization ratio of equity to total asset (ETA) variable is included in the regression models. This relationship can be positive or negative. Berger and De Young (1997) suggest that a higher capital to asset ratio represents lower bad loan problems which cause reduction in the additional costs to recover these bad loans. Dietsch and Lozano-Vivas (2000) and Lozano- Vivas et al. (2001) argue that a lower capital to asset ratio is associated with lower bank efficiency, since it involves taking higher risk, therefore, higher levels of ETA are associated with higher bank efficiency. The findings of Fries and Taci (2005), Grigorian and Manole (2006) and Chortareas et al. (2012) support this idea. In contrast, low capital ratios may encourage banks to undertake risky business by investing in highly profitable projects. This may help banks obtain higher efficiency at least in the short term. Moreover Sufian (2009) and Akhigbe and McNulty (2005) suggest that less efficient banks could have been involved in riskier operations and, in the process, tend to hold more equity. Altunbas, et. al (2007), by sampling banks in Western Europe, demonstrate that inefficient banks tend to hold higher levels of capital

Liquidity: According to the CAMEL[1] model requirements, liquidity is rated according to volatility of deposits; reliance on interest-sensitive funds; technical competences relevant to structure of liabilities; availability of assets readily convertible into cash; and access to interbank markets or other sources of cash, including lender-of-last resort facilities at the central bank. This measure demonstrates how much of the liabilities of banks can be covered by liquid assets. A higher ratio indicates more liquidity, implying that banks are doing a better job in terms of liquidity management and, thus, are better-

[1]) CAMELS is an acronym for Capital adequacy, Asset quality, Management, Earnings, Liquidity and Sensitivity to market risk, that issued by bank supervisors to rate banks during on-site examinations

performers. Therefore, it is expected a positive relationship between liquidity and profitability (Hesse and Poghosyan, 2009).

Following studies of Molyneux, and Thornton (1992); Altunbas and Marques (2008); Poghosyan and Hesse (2009), Altunbas and Marques (2008), Chortareasa (2012), liquid asset to short term deposit and funding (LATD) is implied as a measure for liquidity. Altunbas and Marques (2008) state that keeping a high level of liquidity ratio is expensive while Molyneux, and Thornton (1992) state that holding liquidity imposes a cost to the bank. Jensen (1986) also states that although high cash holdings (as a large part of liquid asset) can reduce the liquidity risk for banks, on the other hand they can also be associated with agency problems.

On the other hand, because ratio of liquid asset to deposit is a deposit run off ratio that represents what percentage of a bank's deposit funds could be met if they were withdrawn suddenly, a higher ratio causes a bank to be more liquid and thus less exposed to failure. Thus, we expect to have a negative relationship between bank efficiency and liquidity (Kosmidou et al., 2005).

Credit Risk: For accounting credit risk as a bank-specific variable we proxy ratio of loan loss reserves to total loans (LLRTL), although acknowledging that a better credit risk measure could be the ratio of non-performing loans to total loans. However, since data on non-performing loans for the research sample in the Bank Scope database is filled out very poorly the loan loss reserve to total asset is used as a proxy for credit risk. This ratio is part of 'Asset Quality' ratios of the bank and demonstrates the quality of loans of a bank. The higher the ratio, the more problematic the loans are.

This measure represents how much of the total portfolio has been provided for, but not written off. The high ratio could signal that the loans are problematic and thus the higher risk of the loan portfolio. However, according to the risk-return hypothesis it could represent a positive relationship between risk and profits. Therefore, although we acknowledge a negative impact of LLRTL on bank performance it is difficult to hypothesise the sign of this relationship. In many efficiency studies loan loss provision has been used as an input for measuring the efficiency score since it is considered as a cost (Altunbas et al., 2000; Iannotta et al., 2007; Pasiouras, 2008). These studies support this idea that the loan loss provision should be considered and treated as a cost which has an undesirable significant impact on the ranking of efficiency performance.

***Size*:** Followed by many studies in banking industry, the logarithm of total assets have been used as a proxy of bank size. Large bank size might result in scope economies which leads to loan and product diversification, therefore, providing access to markets that a small bank cannot enter, or in scale economies with reduced costs. Some authors have found a positive relationship between bank size and efficiency (Drake et al. 2003; Ataullah et al, 2004; Sufian, 2009b). However, Sufian and Abdul Majid (2007) and Chortareasa (2012) demonstrate a negative relationship between the size of the bank and its efficiency. In a few studies (Yao et al, 2008.) no significance impact of size on efficiency has been reported. Akhigbe and McNulty (2003), Carvalo and Kasman (2005) report medium-size banks, demonstrate a higher efficiency relative to small and large banks.

According to Hauner (2005), two explanations exist for supporting the idea of positive impact of size on bank efficiency. Firstly, large banks pay less for their inputs (market power) and secondly large banks face increasing return to scale due to allocation of fixed costs or efficiency gains from a specialized workforce.

Country-specific variables

Country-specific variables used in this research are GDP Growth, inflation and market concentration (asset-based) which are defined in the following section.

Inflation: In this research annual change in the Consumer Price Index (CPI) has been used to control for economic uncertainty in the country. Perry (1992) states the influence of inflation on bank performance can be negative or positive. Pasiouras (2008) and Gardener et al. (2011) found a negative relationship between efficiency and inflation which supports the general view that inflation hinders creditor institutions. Kenjegalieva and Simper (2011), Sufian (2012) found a negative relationship between inflation and bank efficiency. Their findings support Boyd et al.'s (2001) result that demonstrated that countries with high inflation have underdeveloped financial systems and banks thus, they are less efficient.

GDP Growth: One of the important variables influencing bank performance is the economic activity in the country. This variable in this study is defined by real GDP growth and annual percentages of constant price GDP. Poghosyan and Hesse (2009) stated that banks generate less non-performing loans when businesses are doing well, which boosts profitability. Moreover, when the economy is booming as a result of

increased activities they can expand lending and generate more fee income. Gardener et al. (2011) and Grogorian and Manole (2006) find a positive relationship between efficiency and economy growth. However, Pasiouras (2008) found a negative relationship between growth of GDP and efficiency. He argued that under expansive demand conditions banks feels less pressure to control their inputs and thus become less efficient.

Concentration: Concentration in this research is a measure which uses Herfidenhal Index asset base (that is, the assets of the three largest banks to overall asset of banks in each country, each year). Structure-Conduct-Performance (SCP) theory states that higher concentration boosts bank performance because it leads to greater market power. On the other hand, Efficiency Market Hypothesis (EMH) suggests that with higher concentration, there is less bank competition, which in turn leads to less efficient banking. While Pasiouras (2008) and Delis (2009) suggest a negative relationship between concentration and bank efficiency Figueira et al (2009) found a significant relationship with a small positive coefficient.

3.2 Oil Price Movement Literature

In this section the history of the oil price shock over 150 years will be reviewed and the empirical studies which cover the relationship between oil price shock and various economic indicators (eg. economic growth, interest rate, inflation, unemployment, exchange rate) and financial systems (eg. monetary system and stock market) will be explored. In total, 48 papers from JSTORE, Elsevier, Science Direct databases, which investigate the relationship between oil price and various economic indicators and financial systems, were reviewed in this section.

According to Killian (2007), there are four reasons why fluctuation in energy prices is different from price volatility in any other good. Firstly, the sharp increases associated with energy prices has not been found to occur with respect to other goods or services. Secondly, energy demand is relatively inelastic, thirdly, energy price fluctuation is ostensibly dictated by exogenous forces and, fourthly, historically large energy price increases have often triggered severe economic turbulence.

Oil price, which is the best indicator of energy prices, has often attracted the attention of policy makers and economists and numerous studies have made attempts to explain the effect of oil price fluctuations on economic activities and financial systems.

3.2.1 Oil Price Movement History Over 150 Years

The price of oil, just like the price of any other commodity, has faced fluctuations during times of shortage or oversupply. In this section the fluctuations of oil price over recent 150 years will be briefly explained.

1860 – 1900

When the U.S civil war commenced in 1861, there was a surge in prices of commodities due to an increase in demand. This surge impacted the oil market too, mainly due to the breakdown of turpentine supplies, the taxation policies applicable for alcohol (which made it costlier to be used a substitute for petroleum as a source of illumination) and the fall of prices in 1862 that resulted the closure of drilling operations earlier which in turn had affected the production of oil. Thus, it was the increase in demand and the decrease in supply during the US civil war that triggered the first oil price shock (Hamilton, 2011).

While the price of oil was USD2 per gallon at the beginning of the industrial period (1865-1899), it fell by 56 cent per barrel by 1892. This price fall was a result of the growth in oil production due to drilling in new areas of Pennsylvania and the growth in Russia's oil production (Hamilton, 2011).

1900-2000

With the development of electricity as source of illumination at the beginning of the 20th century, the role of oil as a source of illumination slowly diminished and from then on, oil played a more fundamental role in the production of heat and power for transportation in commercial and industrial areas. Thus, oil achieved economic value within the automobile manufacturing and sales sectors.

After the Second World War, as a consequence of economic and political events, three post war recessions occurred that impacted oil prices. During the first recession between 1945 and 1947, oil prices increased by 80% as the result of a sharp increase in demand for petroleum products (William, et. al., 1963, p.805). In 1951, when Mohammad Mossadegh, the then Iranian prime minister, nationalised Iran's oil industry, there was an international boycott of Iran that effectively removed 19 Million Barrels from world oil production that had been contributed by Iran (Hamilton, 2011). Later, between 1950 and 1953, the Korean War prompted the Office of Price Stabilization to order a freeze in oil prices.

The second recession that resulted from the Second World War experienced political events like Israel's invasion of Egypt in 1956 and the sabotage of the Iraqi pipeline that ran through the Eastern Mediterranean which caused a fall in the production of oil in the Middle East. However, within a few months total world production was back up to where it had been because of an increase in the production of oil outside the Middle East.

The third post world war recession occurred in August 1957 after a drop in the export of goods and services by the US (Hamilton, 2011). In a time of transition in the international economic and political landscape, with extensive de-colonisation and the birth of many new independent states in the developing world, a permanent intergovernmental organization in Baghdad was created that plays, until now, a unique role in the crude oil market.

In 1960, The Organization of Petroleum Exporting Countries (OPEC) was created with five founding members: Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. Nine other countries joined later. They were - Qatar (joined in 1961), Indonesia (joined in 1962 but suspended its membership from January 2009); Libya (joined in 1962); United Arab Emirates (joined in 1967); Algeria (joined in 1969); Nigeria (joined in 1971); Ecuador (joined in 1973 but suspended its membership between December 1992 and October 2007); Angola (joined in 2007) and Gabon (a member from 1975–1994). In March 1971, when the Texas Railroad Commission changed its policy about percentage of proration, the power to control the crude oil price was shifted from the United States (Texas, Oklahoma and Louisiana) to OPEC (Hamilton, 2011).

Oil prices remained remarkably stable in the decades following the Second World War all the way through to the early 1970s (Hamilton,2011). However, a turbulent decade in

the Middle East began with the Arab-Israel war. On October 5, 1973, Israel was attacked by Syria and Egypt and Arab members of the OPEC announced an embargo on oil exports to selected countries viewed as supporters of Israel, which was followed by significant cutbacks in OPEC's total oil production. Although some countries like Iran increased their production, but this only offset a small part of the deficit. The embargo caused a 400 per cent increase in oil prices, but only for six months (Hamilton, 2011).

Between 1974 and 1978 oil prices were relatively smooth, but the Iranian revolution of 1978 resulted in the highest oil prices since the Second World War. The strike within the oil sector in Iran caused a big fall in Iran's oil production (7% of the world's production at that time) but the impact of this shortage was limited because about a third of the lost Iranian production was made up by increases in oil production from Saudi Arabia and other countries (Williams, 2008).

Later in 1979, Iran had reverted to about half of its pre-revolution production, soon after which Iraq launched a war against the country in the September of 1980. After the Iraq attack on Iran, both these oil producing countries decreased their production (jointly at about 6% of world production at the time) which caused a rise in oil price by over 150%. (Williams, 2008)

The response of oil consuming countries to the price shock was that that they reduced oil consumption; this was in early 1980 (Hamilton, 2011). From 1982 to 1985, OPEC attempted to play a significant role in controlling oil prices by setting a low production quota for individual members. But in most cases, its policies were not effective in stabilizing prices since many members produced more than their quota and Saudi Arabia as the central producer, had to reduce its production several times in order to stem rapidly falling prices (Williams, 2008).

By 1990, Iraq had returned to its pre-war level of production. However, Iraq, in the same year invaded Kuwait and this was followed by the Persian Gulf War to liberate Kuwait. The Iraqi invasion of Kuwait and concerns over the conflict spreading to Saudi Arabia resulted in the price of crude oil doubling within a few months (Hamilton, 2011).

Between 1990 and 1997, worldwide oil consumption increased due to a booming economy in the Asia-Pacific region and a strong United States economy. As a result of this increase in demand, oil price recovery happened. Oil prices increased rapidly during

this period until the end of 1997 when the economic crisis in Asia started. In 1998, Asia's oil consumption declined for the first time since 1982. Following OPEC's decision to cut quotas, prices began to recover in early 1999 and increase smoothly till the terrorist attacks in the United States on September 11th 2001. The subsequent oil price fall was once again addressed by the reduction in oil production quotas by OPEC and non-OPEC nations following which the prices began to recover again (Williams, 2008).

2000-Present Time

A new set of international problems occurred in 2003 while the American economy was improving and the Asian demand for crude oil was on the rise. A general strike in Venezuela resulted in a decrease in the country's oil production by 2.1 Million Barrels/Day for the months of December 2002 and January 2003. Shortly following this, the US military action undertaken in Iraq caused a decrease in Iraq's oil production by 2.2 Million Barrels/Day between April 2003 and July 2003. In response to these events, and to meet international needs, OPEC increased its production and the price of oil achieved its highest ever level in 2004. Nearly at the same time the instability in the Middle East and the Yukos crises increased demand for oil in countries as diverse as India, China and US. According to Kilian (2008), this should be included in the list of post-war oil shocks. However, the oil supply affected with respect to these events affected a much smaller share of the global oil supplies compared to the other events covered here and had negligible impact on global oil supplies. When one considers the 12-month average of global petroleum production for this period, it is evident that there was phenomenal average growth throughout 2003. While oil prices rose between November 2002 and February 2003, these spikes were modest and short lived (Hamilton, 2011).

In 2004 and 2005, global economic growth was quite impressive and according to IMF estimates there was an average growth of 4.7% in real world gross product for this period. This growth also corresponded to an increase in demand for oil. World oil consumption had increased by 5 Million Barrels/Day during this period (a rate of 3% per year) which in turn caused oil prices to rise (Hamilton, 2011).

After 2005, oil production later could not respond to further increase in demand. Though there was no dramatic geopolitical event that caused this stagnation, the reasons

for demand not being met could be accredited to the political instability in places like Iraq and Nigeria and the drop in production capacity in some of the oil fields in the North Sea, Mexico's Cantarell field and Indonesia. Many of these oil fields that had helped sustain earlier production gains had reached maturity and were by this time having relatively rapid decline rates. Oil production rate from the North Sea which accounted for 8% of world production in 2001 had fallen by more than 2 Million Barrels/Day by the end of 2007. Mexico's Cantarell, which till recently had been the world's second largest producing field, saw its production rate decline by 1 Million Barrels/Day between 2005 and 2008. Indonesia, one of the original members of the Organization of Petroleum Exporting Countries, saw its production peak in 1998 and is today, an importer rather than an exporter of oil. In 2007, Saudi Arabia, which had become the most important oil producing country by this time, decreased its oil production by 850,000 barrels per day from its production rate in 2005 (Hamilton, 2011).

A long recession began in 2008 but the oil price continued to rise steadily until July. Spare capacity was low and speculation in oil was particularly strong. On the 3rd July trading on NYMEX closed at USD145.29 per barrel which was a record high. However, as the seriousness of the recession became apparent demand fell and the oil price had retreated to below USD40 per barrel by December. In January 2009 OPEC stepped in and cut production by 4.2 million b/d. This intervention caused prices to rise and this movement was supported by an increase in demand in Asia. In February 2011 the Libyan civil war brought about the loss of Libyan exports which caused a sudden increase in the oil price. Though most of the Libyan production was subsequently restored, political instability in areas of the Middle East and North Africa has continued to support the oil price (Hamilton, 2011).

The history of oil price movement which has been reviewed in this section is illustrated in Figure (3.3). Figure (3.3) shows the movement of the price of oil during the period 1947-2011 with the significant events that caused changes in price of oil.

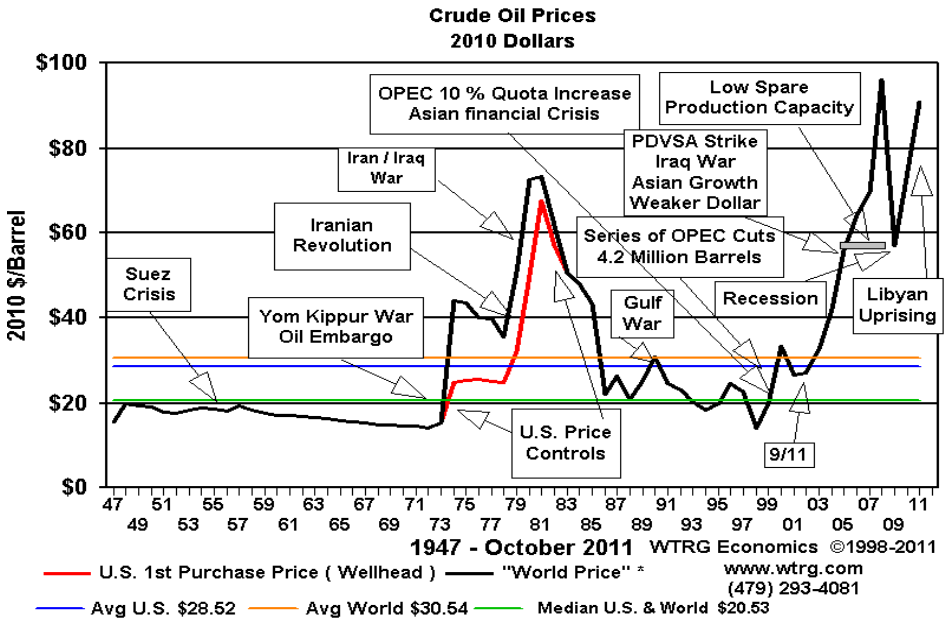


Figure 3-2) Crude Oil Prices 1947 - October 2011 (source: WTRG Econometrics)

After briefly reviewing the changes in the price of oil over the past 150 years, the next section will explain the different economic factors and their relationship with changes in the price of oil that have been studied in the literature.

3.2.2 Oil Price Movement Empirical Studies

Movement in the price of oil, as a significant source of energy, has the most impact on macroeconomic indicators; economic growth, inflation, unemployment, exchange rate, interest rate and financial systems (eg. monetary system and stock market). In the sections to follow, the relationship between oil price and these factors will be discussed.

3.2.2.1 Oil Price Movement and Macroeconomic factors

In this section the relationship between oil price and macroeconomic indicatorss will be presented. These variables are economic growth, inflation, unemployment, exchange rate and interest rate.

Oil Price Changes and Economic growth

Early studies on the relationship between oil price changes and economic growth focused on the demand-side effects of oil price increases. These studies began with a

production function that relates output to the inputs of capital, labour and energy followed by negative linear relationship. By the mid-1980s, after the huge oil price fall, the estimated linear relationship between oil price and GDP growth had become less convincing (Hamilton, 2003).

Mork (1989) finds an asymmetric impact of oil price on economic activities which means that oil price-decreases do not induce an economic boom in the same proportion as oil price-increases induce recessions. Thus, the early theoretical argument, considering the new data after 1985, was no longer applicable (Rafiq et al., 2009).

A number of authors including Lee et al. (1995) and Hamilton (1996) imply several asymmetric non-linear transformations of oil price changes instead of a simple linear one. Hamilton (2003), states that an entirely linear relationship between oil price and economic growth can no longer be expected. While oil price increase has a profound negative impact on economic activities, the effect of oil price decrease is more complex (Zhang, 2008).

Gasser and Goodwin (1986) found a significant impact of crude oil prices on the US economy. In 1994, Mork and Olsen studied the correlation between oil-price increase and GDP in seven OECD countries (Canada, France, Japan, Norway, West Germany, the UK and the US). Their results showed a significant negative correlation for all these countries, except Norway, an oil producer, for whom the correlation was positive.

Lardic and Mignon (2006) examined the importance of oil price to the GDP of 12 European countries (Austria, Belgium, Finland, France, Germany, Italy, Norway, Portugal, Spain, Sweden, the Netherlands, and the UK) and found an asymmetric co-integrated relationship for most countries from the samples that they used. Jiménez-Rodríguez (2005) analyzed the impact of oil price on real GDP in the main industrialized countries (individual G-7 countries, Norway and the Euro Zone as a whole). They concluded that while there is some non-linear relationship, the effects of the oil-price shock differ between oil importing countries and oil exporting ones.

Studies regarding the effect of oil price shock on economic growth do not only cover the European countries and the US alone. Cunada and Gracia (2005) investigated this relationship for six Asian countries (Japan, Malaysia, Singapore, South Korea, Thailand, and the Philippines). Moreover, Zhang (2008) confirmed the existence of a non-linear relationship between oil price shocks and economic growth in Japan, and

Berument et al. (2010) examined the impact of oil price shocks on the MENA countries (Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Kuwait, Libya, Oman, Qatar, Syria, and the UAE). They found that oil price shocks have statistically significant and positive effects on the growth of countries which are net exporters of oil.

Oil Price Changes and Inflation

From an empirical point of view, considerable research shows that output and inflation have been affected by oil price changes (Hamilton, 1983, 1988, 1996, 2000; Tatom, 1988; Mork, 1989, 1994; Kahn and Hampton, 1990; Hooker, 1996, 1999 a,b; Huntington, 1998). In these studies the influence of changes in price of oil on inflation has been joined with factors like business cycle, exchange rate, interest rate, and monetary policy. However, Cologni and Manera (2008) studied the effects of oil prices on inflation. By implying a co-integrated vector-auto- regressive (VAR) framework for G-7 countries they stated that one of the consequences of the oil price shock is an increase in inflation.

Cunado and Gracia (2005) investigated the impact of the oil price shock on inflation by using two different proxies. They found that when oil price is measured using the world oil price index, the impact is higher than when it is measured using national real price currency. They suggested that the role of exchange rate or national price variations is important with respect to this difference. On investigating the tri-variate relationship between inflation rates, industrial production growth rate and oil price, they found that real activity is not affected by oil price only through inflation but there are some other mechanisms which cause oil prices to affect real activity.

Oil Price Changes and Unemployment

Increase in energy prices will cause an increase in production costs which leads to increased inflation. On the other hand, inflationary pressure causes a decrease in the demand side which, in turn, leads to a fall in production and these changes affect employment. Notable examples of an increase in unemployment as a result of oil price changes can be found during the oil price shocks in the 1950s and 1970s when a great number of labourers were reallocated in different industrial sectors (Loungani, 1986).

However, it is not only industrial sectors which are affected by oil price shocks. Uri (1995) examined the structural stability of the relationship between volatility of oil price and changes in agricultural employment over the period 1947-1997. His results show

that a stable relationship exists. Gao and Kliesen (2005) examined the impact of oil price volatility on key US macroeconomic indicators such as fixed investment, consumption and employment over the period 1984-2004. Their findings reaffirmed previous findings.

Studies on the oil price-employment relationship are not limited to only the US. Papapetrou (2001) examined the dynamic interactions between real oil prices, interest rates, industrial production, real stock returns and employment for Greece. In his study, he estimated two specifications, employment specification and industrial production specification and concluded that oil price has a significant effect on economic activities and employment.

Oil Price Changes and Exchange Rates

Chen and Chen (2007) examined the possibility of any long-run equilibrium relation between real exchange rates and real oil prices. They used monthly panel data for the G7 countries for the period 1972 to 2005 and discovered a co-integrating relationship between oil prices and real exchange rates.

Chen and Chen's (2007) paper differed with other papers in this field, such as Zhou (1995), Chaudhuri and Daniel (1998) and Amano and Norden (1998), the paper examined the role of real oil prices in predicting real exchange rates over long horizons. Panel predictive regression estimation also suggests that real oil prices have a significant power in helping forecast real exchange rates.

Oil Price Changes and Interest Rates

From empirical evidence, it can be observed that for most of the considered countries, unexpected oil price shocks seem to have an impact on interest rates and this could be indicative of contractionary monetary policy responses directed to tackle inflation. According to the 'real balance effect' theory, following an oil price increase, people have a tendency to balance their portfolios in favour of liquidity and this creates an increase in demand for money. If this growing demand for money cannot be met by monetary authorities with an increase in money supply, then this situation will result in price level rises which will cause a decrease in real balances that eventually boosts interest rates.

Papapetrou (2001) investigated the relationship between the entities, oil prices, real stock prices, interest rates, real economic activity and employment for Greece. He used

a multi-variate vector auto-regression VAR approach and found that oil price shocks have a positive impact on interest rates. This result is on expected lines because an increase in oil prices causes inflationary effects in the economy and this in turn brings in upward pressure on interest rates.

3.2.2.2 Oil Price Movement and Financial Services

In this section the relationship between oil price and financial services will be presented. The studied services in the literature are stock market, bank profitability and monetary system.

Oil Price Changes and Stock Markets

In a pioneering paper, Jones and Kaul (1996) used the cash flow dividend valuation model to test the reaction of international stock markets in Canada, UK, Japan and the US to oil price shocks. According to their findings, the stock market reactions in the US and Canada could be entirely accounted for as an impact of oil shocks on cash flows; whereas for Japan and UK, these test results were inconclusive.

Huang et al. (1996) used an unrestricted vector autoregressive (VAR) to show a significant relationship between some American oil company stock returns and oil price changes. However, there was no evidence found for any relationship between oil prices and market indices such as the S&P 500. On the contrary, Sadorsky (1999), applied an unrestricted VAR with GARCH effects to American monthly data and was able to show a significant relationship between oil price changes and aggregate stock returns.

There are some recent papers that focus on the emerging markets in Europe, Asia and Latin America. The results from the studies conducted in these papers show a significant short-term link between oil price changes and the stock markets in these countries. Papapetrou (2001), using a VAR model, was able to show a significant relationship between oil changes and the stock markets in Greece while Basher and Sadorsky (2006) used an international multi-factor model and were able to reach a similar conclusion for stock markets in other emerging countries too.

However, there has been relatively less focus on the smaller emerging market countries such as the GCC countries where share trading is a relatively recent phenomenon. Hammoudeh et al. (2004), used VAR models and co-integration test and demonstrated

that there is a bi-directional relationship between stock returns in Saudi Arabia and the oil price changes there.

Oil Price Changes and Monetary Systems

Several economists (Tatom, 1988; Bernanke, Gentler and Watson,1997) pointed out that monetary authority behaviour could be a possible explanation for the economic effects of oil price shocks. As we have seen, oil price shocks have the ability to influence the real economy and inflation in different ways and central banks usually experience difficulties in stabilising inflation and production at the same time. There is also an abundance of studies, including those by Herrera and Pesavento (2009) and Kilian and Lewis (2009), which investigates whether the economic effects of oil price changes are also dependent on the response of monetary policies.

On the same note, historically, it was noticed that when the oil prices went up prior to a recession, so did the interest rates. Bernanke et al. (1997) argued that the increase in the interest rates led to the downturn in the monetary policy; this was a view that was challenged by Hamilton and Herrera (2004), who argued that contractionary monetary policies play only a secondary role in the generation of real output and that the primary reason directly leading to contractions is the rise of oil prices. More recent work by Kilian and Vigfusson (2009) show that the estimates that were presented by Bernake et al. (1997) supporting feedback from monetary policy were not only inconsistent but also exaggerated the actual effects of the oil price shocks.

Oil price changes and bank profitability

In literature, there is only one study which investigates the impact of oil price shock on profitability of banks. Hesse and Poghosyan (2009), studied the relationship between oil price shock and bank profitability. In the study the profitability of banks has been measured by the simple financial ratio ROA and the methodology was dynamic panel technique because of the persistent nature of the dependent variable. Hesse and Poghosyan (2009) only study the impact of positive oil price changes. They found oil price shock influence performance of banks.

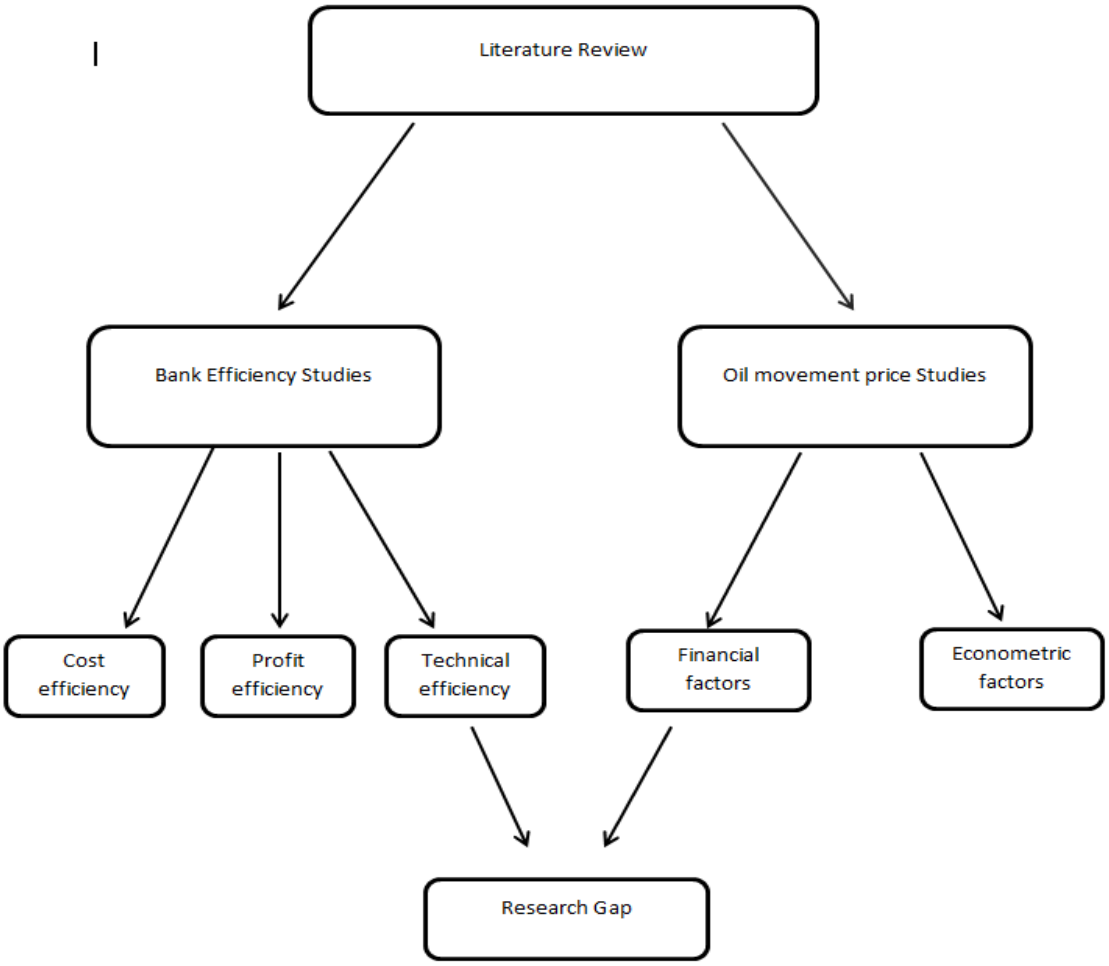
3.3 Significance of Research

This chapter has reviewed the literature from two different perspectives: firstly, the performance of banks and factors influencing it and, secondly, oil price movement and its relationship with economic indicators and financial systems.

From the first perspective, there have been a number of valuable studies of bank efficiency using cross-country panel data which investigate the impact of different environmental variables on banks' performance alongside a vector of bank-specific and country-specific variables. However, none of these studies provide a picture of influence of oil price movements on banks efficiency, in spite its impact on economy and financial services.

From the second perspective, the literature provides many studies which explore the relationship between oil price movement on key economic factors and financial services. There is only one paper (by Hesse and Poghosyan, 2009) which study the influence of positive oil price shocks on profitability of banks. Thus a gap in the literature of oil price studies can be observed.

This research fills the gap in literature of both bank performance and oil price movement by adopting more complex measure of bank performance. A two-stage DEA methodology will be applied which in second stage static panel technique will be conducted.



Source: researcher for the purpose of this study

Figure 3-3) Significance of Research Gap

Therefore, the first main variable of research is bank efficiency as a proxy for bank performance which will be obtained by applying DEA technique. The other two main variables are oil price changes and oil revenue. Oil price changes is a vector of five different positive and negative movements in the price of oil which be explained deeply in chapter five.

In order to capture the impact of oil price movements on the performance of banks, a sample of oil exporting countries in the Middle East (Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirate) will be analysed. The economies of these countries are highly dependent on oil exports. Thus, the links between oil price movement and the performance of banks operating in these countries is of high policy interest.

The main questions that this research will answer, as were introduced in chapter 1 are:

1. *What are technical, scale, overall and super efficiency scores of commercial, investment and Islamic banks operating in MEOE countries?*
2. *Does oil revenue impact bank efficiency and whether this impact is a direct or indirect one?*
3. *Do oil price changes impact bank efficiency and whether this impact is a direct or indirect one?*
4. *If oil price impact performance of banks, banks operating under which operational styles will be most affected?*

3.4 Chapter Summary

This chapter reviews two different bodies of literature. The first body of literature is that of bank performance studies and of environmental factors influencing the performance of banks. The second was the body of literature which explored oil price movement history, the relationship between oil price movements and economic indicators and finance systems.

The first section provides a brief overview of the various approaches used to measure efficiency and identifies their sources. There are two dimensions explored here: non-parametric and parametric approaches. The non-parametric approach uses programming techniques such as the DEA, whereas the parametric approach is based on regression analysis. Between the two primary approaches, the non-parametric approach is more advantageous than the parametric approach because of its simplicity and computational ease. Non-parametric approach also does not require any specific assumptions. However, non-parametric approach is vulnerable to biases because it does not consider the possibility of any technical or allocated inefficiency.

Following an overview of efficiency measurement studies, the most commonly used non-parametric model, DEA was discussed and modification and development of this model was explained. Moreover in this chapter by reviewing a number of recent studies it was identified that the best approach for choosing inputs and outputs is the intermediation approach and based on a systematic survey the factors most broadly used in input and output vectors were categorized. In the environmental section the most interesting factors the researcher, have investigated influence of them on banks efficiency were explored and most cites two-stage cross-country studies were reviewed

in order to find out the best selection of environmental variables influencing bank efficiency.

In the second section, the history of the oil shock and the various socio-political events that influenced oil prices over the past 150 years was reviewed. The relationship between oil prices and some major economic indicators and financial systems were discussed.

After studying various literature sources for the relationship between oil price changes and economic development, the general observation was that their relationship was asymmetric. The relationship between oil price changes and inflation was also studied and a general observation showed there is positive relationship between oil price shock and inflation. The study of the relationship between oil price change and unemployment showed that increased oil prices affects production which in turn affects employment. The study of the relationship between oil price changes and the stock market showed mixed responses wherein there seemed to be a relationship for some countries whereas for other countries, results on testing the relationship were inconclusive. Oil price changes were also studied in tandem with monetary systems and it was shown how changes in oil prices can trigger economic effects due to changes in monetary policies. Lastly the relationship between oil price changes and real exchange rates and the relationship between oil price changes and interest rates were studied and evidence was found that both exchange rates and interest rates were significantly influenced by oil price changes.

Reviewing the literature of these two perspectives guides researcher to find out the gap in the literature of bank efficiency and oil price m studies. The significant of the research which was presented in this chapter, demonstrated that although oil price changes have a very crucial role in economy and performance of financial services, however there is only one study in literature which examine the relationship between oil price shock and bank performance. The mentioned study only consider positive changes in price of oil and measure performance of bank as simply as ROA ratio.

Chapter 4 RESEARCH METHODOLOGY

The focus of this chapter is on the framework and methodology which will be used in order to investigate the efficiency of banks in MEOE countries, and the impact of oil price movement on it. The research is based on two stages. In the first stage a Linear programming model will be applied to obtain the efficiency of banks performing in MEOE countries. Four different efficiency scores will be obtained and one of them will be selected as a proxy of banks' performance.

In the second stage the impact of the main variables, which are oil revenue and oil price changes on performance of banks, will be investigated by applying the panel static model. However, the researcher's interest is in finding out how oil price movement impacts the performance of banks, directly or indirectly. Therefore, environmental variables will be entered in the second stage in the different way as in previous studies. This chapter will present the framework and methodology applied to answer the research questions.

4.1 Conceptual framework

In the first stage of the research the non-parametric DEA is applied to obtain an efficiency score. At this stage, initially the standard efficiency model is used to obtain efficiency scores.

The second stage of the research consists of two parts. In the first part, by introducing the OED (Oil Export Dependency or oil revenue) variable with other environmental variables the relationship between oil revenue and the efficiency of banks will be investigated. In the second part, the oil revenue variable will be replaced by oil price changes variables and the relationship between each one of these variables with bank efficiency will be explored.

In order to find out how oil price movement impacts the performance of banks, firstly only bank-specific variables along with the main variable (oil price movement) will be included in a regression model. If the oil variable is significant then it will be concluded that oil price movement impacts the performance of banks. Secondly, to find out if oil price movement impacts the performance of banks directly or indirectly, country-specific variables will be included in the model. If the oil variable is significant, it will be concluded that oil impacts the performance of banks directly. However, if the oil

variable is insignificant, it will be concluded that oil price movement impacts the performance of banks through country-specific variables which are macroeconomic variables. Figure (4.1) illustrates an overview of the framework of this research. A more detailed framework of research will be presented after full explanations of the research steps.

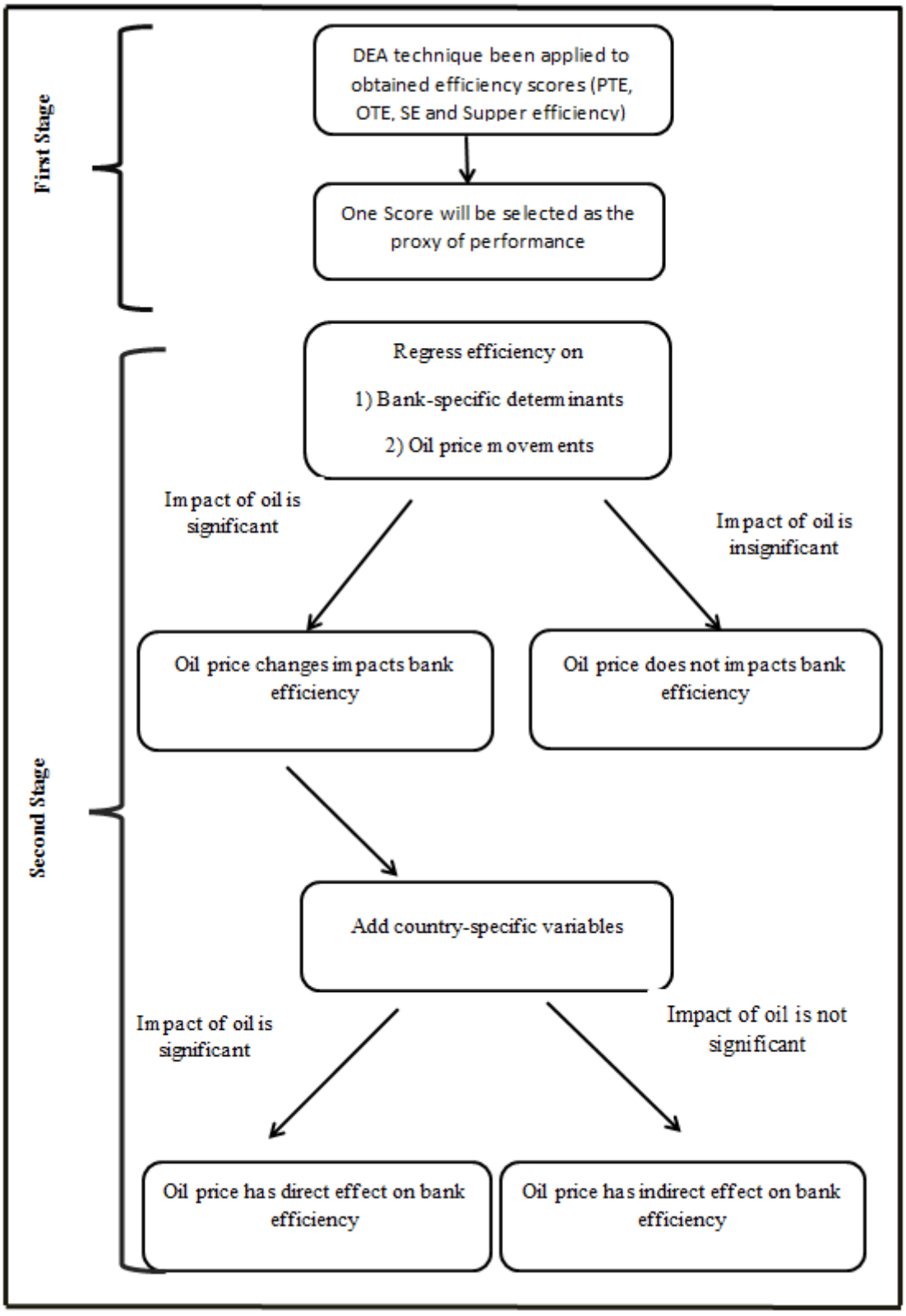


Figure 4-1) Overview of Conceptual framework of research

Figure (4.1) illustrates the overview of conceptual framework of research. In the following sections each of the steps in the framework has been explained using equations, figures and tables.

4.1.1 First Stage

In the first stage of the research, the efficiency score of banks operating in MEOE countries will be estimated. For this estimation, three version of the DEA model have been used in the first stage: firstly, Constant Return to Scale (CRS) which derives Overall Technical Efficiency (OTE); secondly, Variable Return to Scale (VRS) output orientation which represents Pure Technical Efficiency (PTE) and these two estimations lead to obtaining Scale Efficiency (SE) and, lastly, the Super Efficiency model which drives super efficiency (super eff) will be applied. In the following sections the mathematical concepts behind these four estimations have been provided.

4.1.1.1 Measuring efficiency for multi-inputs and multi-outputs using data envelopment analysis

Data Envelopment Analysis first proposed by Farrell (1957), followed by Shephard (1970) and then improved by Charnes, Cooper and Rhodes (1978), has been widely used in the efficiency literature. DEA as a non - parametric method of efficiency measurement consists of a set of DMUs for each of which the only data available are the levels of their multiple inputs and outputs.

Consider n banks ($j = 1, 2, \dots., n$) that use m inputs ($x_{ij}, i = 1, \dots. m$) for producing s outputs ($y_{rj}\ r = 1, \dots., s$). Using DEA approach one can measure technical efficiency of bank j as:

$$\boldsymbol{Max\ h_0 = \frac{\sum_{r=1}^{s} u_r\ y_{rj_0}}{\sum_{i=1}^{m} v_i\ x_{ij_0}}} \qquad \textbf{Equation 4-1}$$

Subject to:

$$\frac{\sum_{r=1}^{s} u_r\ y_{rj}}{\sum_{i=1}^{m} v_i\ x_{ij}} \leq \mathbf{1};\ \ \boldsymbol{j = 1, \dots. n} \qquad \textbf{Equation 4-2}$$

$$\boldsymbol{u_r\ \geq\ \varepsilon\ \ r = 1, \dots s}$$

$$\boldsymbol{v_s\ \geq\ \varepsilon\ \ \ i = 1, \dots m}$$

Where: x_{ij}: $amount\ of\ input\ i\ used\ by\ bank\ j$

y_{rj}: $amount\ of\ output\ r\ produced\ by\ bank\ j$

u_r: $the\ weight\ given\ to\ output\ r$

v_i: *the weight given to input i*

m: *the number of inputs used by each bank*n: *number of banks*

s: *the number outputs produced by each bank*

h_0 : *efficiency score of* j^{th} *bank*

ε: *a non*

$-$ *Archimedean value to enforce strict positivity of the weights*

According to the above model unit $j_{0,}$ technical efficiency will be maximized when the efficiency of all other units is less than or equal to one. This fractional linear programming can be transformed to the linear form as follows: (considering constant return to scale (CRS) assumption):

$$\boldsymbol{Max\ h_0 = \sum_{r=1}^{s} u_r\, y_{rj_0}} \qquad \textbf{Equation 4-3}$$

Subject to:

$$\boldsymbol{\sum_{i=1}^{m} v_i\ \ x_{ij_0} = 1} \qquad \textbf{Equation 4-4}$$

$$\boldsymbol{\sum_{r=1}^{s} u_r\ y_{rj} - \sum_{i=1}^{m} v_i\ x_{ij} \leq 0\ \ ; j = 1, \dots, n} \qquad \textbf{Equation 4-5}$$

$$\boldsymbol{u_r, v_i\ \geq\ \varepsilon\ ; i = 1, \dots . m, \& \ r = 1, \dots . s}$$

Constraint (4.4) implies that the weighted sum of inputs for bank j is equal to one. However, the constraint (4.4) indicates that all banks are on, or bellow, the frontier which means that the efficiency score of a bank cannot be more than one. This linear programming form is called the CCR model (Charnes, Cooper, and Rhodes).

Banker et al. (1984) declares that the constant return to scale model has several limitations and, in reality, with CCR this is not always the case. The main issue for proposing a more relevant model was that the efficiency of units changes when their size changes, which leads to the introduction of a model using variable return to scale named BCC in the literature (Banker, Charnes, and Cooper). In the Banker et al. (1984) model, the set of DMU_j been denoted, for each DMU$j\ \in\ I$. Let us define the following variables: y_{rj} is the *rth* output of the *jth* DMU, x_{ij} is the *ith* input of the *jth* DMU, λ_j is the weight of the *jth* DMU. Here DMU uses i inputs to produce r outputs. The input-oriented BCC method used to calculate technical efficiency can be formulated as:

$$\min \theta_0$$

Subject to:

$$\sum_{j=1}^{n} \lambda_j \, x_{ij} \leq \theta_0 x_{i0} \quad ; \quad \forall i = 1, \dots m \qquad \textbf{Equation 4-6}$$

$$\sum_{j=1}^{n} \lambda_j \, y_{rj} \geq y_{rj_0} \quad ; \quad \forall r = 1, \dots s \qquad \textbf{Equation 4-7}$$

$$\sum_{i=1}^{n} \lambda_j = 1 \geq 0 \quad ; \quad \forall j = 1, \dots n \qquad \textbf{Equation 4-8}$$

The above model which illustrates the linear programming model for variable return to scale input orientation specifies a benchmark DMU which uses as low a proportion of the inputs of j_0 as possible while at least matching its output levels. The constraint (4.6) signifies that the output levels of inefficient observations are compared to the output levels of a reference DMU that is composed of a convex combination of observed outputs. The constraint (4.8) allows for variable returns to scale. The last constraint ensures that all values of the production convexity weights are greater than or equal to zero so that the hypothetical reference DMU is within the possibility set. $DMUj_0$ is efficient if only if $j_0 = 1$

The linear programming model for a variable return to scale output orientation is illustrated below, which specifies a benchmark DMU that produces as high a proportion of the outputs of j_0 as possible, while at least matching its inputs levels

$$\max \theta_0$$

Subject to:

$$\sum_{j=1}^{n} \lambda_j \, x_{ij} \leq x_{ij_0} \quad ; \quad \forall i = 1, \dots m \qquad \textbf{Equation 4-9}$$

$$\sum_{j=1}^{n} \lambda_j \, y_{rj} \geq \theta_0 y_{rj_0} \quad ; \quad \forall r = 1, \dots s \qquad \textbf{Equation 4-10}$$

$$\sum_{i=1}^{n} \lambda_j = 1 \qquad \textbf{Equation 4-11}$$

$$\lambda_j \geq 0 \quad ; \forall j = 1, \dots n$$

4.1.1.2 Decomposition of Technical Efficiency

As mentioned in the previous section, Constant Return to Scale (CRS) derives Overall Technical Efficiency (OTE). Variable return to Scale (VRS) leads in to a decomposition of OTE into Pure Technical Efficiency (PTE) and Scale Efficiency (SE) components. PTE which in the VRS estimation can be explained by managerial skills such as the

effective screening and monitoring of borrowers, activities related to focussing on attracting depositors, controlling expenses while SE is interpreted as a proportional reduction in usage of input if the bank operates at CRS. In other words, OTE is determined by PTE or managerial skills and SE or economies of scale due to the size of the bank. In mathematical terms it can be written as:

Overall Technical Efficiency = Scale Efficiency * Pure Technical Efficiency

In this research all these three efficiency estimations are calculated. In addition to above efficiency measurements, Super Efficiency estimation which is a more recent estimation is also applied to analyse the efficiency of DMUs. In the following section how the model leads to obtaining this score is discussed.

SORM DEA

The standard Data Envelopment Analysis can be used when all inputs and outputs values are non-negative. However in many cases inputs or outputs can take negative values in some DMUs. Many studies have addressed the issue of negative data for instance Scheel (2001), Portela et al. (2004) and Sharp et al. (2006). Emrouznejad et al. (2010) have recently proposed a Semi-Oriented Radial Measure (SORM) model to solve DEA models in the presence of negative input and/or output values.

The output oriented variable returns to scale SORM model for evaluating DMU j_0 ($j_0 \in \{1,,,,,n\}$ when DMUs have positive and negative values in certain input and output variables simultaneously is as in model :

Max h

s.t. $\sum_{j=1}^{n} x_{ij}\,\gamma_j - h x_{ij_0} \ll 0 \qquad \forall i \in I,$

$$\sum_{j=1}^{n} x_{lj}^{1}\,\gamma_j - h x_{lj_0}^{1} \ll 0, \sum_{j=1}^{n} x_{lj}^{2}\,\gamma_j - h x_{lj_0}^{2} \gg 0 \qquad \forall l \in L,$$

$$\sum_{j=1}^{n} y_{rj}\,\gamma_j \gg y_{rj_0} \qquad \forall r \in R,$$

$$\sum_{j=1}^{n} x_{lj}^{1}\,\gamma_j \gg y_{kj_0}^{1}, \sum_{j=1}^{n} y_{kj}^{2}\,\gamma_j \ll y_{kj_0}^{2} \quad k \in K$$

$$\sum_{j=1}^{n} \gamma_j = 1, \qquad \gamma_j \gg 0 \qquad j = 1, \dots\dots\dots, n$$

4.1.2 Second Stage

In the second stage of this research the impacts of oil price movement on the efficiency of banks in MEOE countries, in addition to contextual variables, will be discussed. Oil price movement measures the changes in the price of oil. To have a better understanding of the consequences of changes in the price of oil, the main variable of this research has been categorized using two definitions. The first one covers the oil revenue, or the degree of dependency of an economy on oil income (OED) and the second definition covers positive and negative changes in the price of oil. These changes will be measured by positive and negative oil price shocks, positive and negative oil price volatility and net increase in price of oil. Each of these variables will be explained in more detail in section (4.2).

Firstly, the researcher is interested to investigate if the oil price movement has impact on bank efficiency, or not, In order to answer this question an empirical specification takes the following general form:

$$EFF_{it} = \alpha + \gamma\, bank - specific_{it} + \delta oil\ price\ movement_{t} + \varepsilon \qquad \textbf{Equation 4-12}$$

As equation (4.18) shows, only the bank-specific and the oil price variable are added to the specification. If the impact of the oil variable turns out to be insignificant, then it can be concluded that the oil price does not have any impact on bank efficiency. On the other hand, if the impact of the oil variable is significant, then the research goes one step further in order to investigate if this impact is direct or indirect. At this stage country-specific variables will be added to the specification.

$$EFF_{it} = \alpha + \gamma\, bank - specific_{it} + \theta country - specific_{it} + \delta oil\ price\ movement_{it} + \varepsilon \qquad \textbf{Equation 4-13}$$

The reason for adding these variables is that they proxy for possible transmission channels of oil prices in to the model. After entering country-specific variables in to the specification, if the impact of the oil variable remains significant, then it can be concluded that the oil variable has a direct impact on bank efficiency, otherwise the impact of the oil variable is indirect and channelled through country-specific variables.

Although in the first stage, all banks will be pooled together and the efficiency of each bank is measured by its distance from the global frontier; however, in the second stage

in order to study the linkage between oil price movements and the efficiency of banks in MEOE countries, the panel data technique will be applied.

Panel data, also known as "longitudinal data", contains a group of individuals observed over multiple time periods i.e. panel data is a combination of cross-sectional data and time series data. A Panel data variable, X_{it}, can be distinguished with two subscripts; the first subscript, $i = 1, \ldots . . N$, represents the individual dimension (banks) and the second subscript, $t = 1, \ldots T$, indicates the time dimension (years). Panel data can be divided into two classifications; balanced panel and unbalanced panel. The balanced panel data have N×T dimensions with no missing observations while the unbalanced panel data has N×T dimensions with some missing observations.

Panel data analysis has some important advantages over cross section or time series analysis. Firstly, it provides an opportunity to better understand the impact of a policy change on different individuals i.e. we can compare the dynamics of this impact before and after the policy change. Secondly, using panel data analysis can improve efficiency in parameter estimation and mitigate multicollinearity issues. Therefore, more precise results with more accurate power in terms of t-statistics can be obtained. Finally, when using panel data, the researcher has the flexibility in modelling the individual heterogeneity effects which permits her/him to model differences in the relationship between individuals.

After explaining the framework in detail and the research stages, the overview of the conceptual framework of the research which was presented in Figure (4.1) will be developed and illustrated in Figure (4.3).

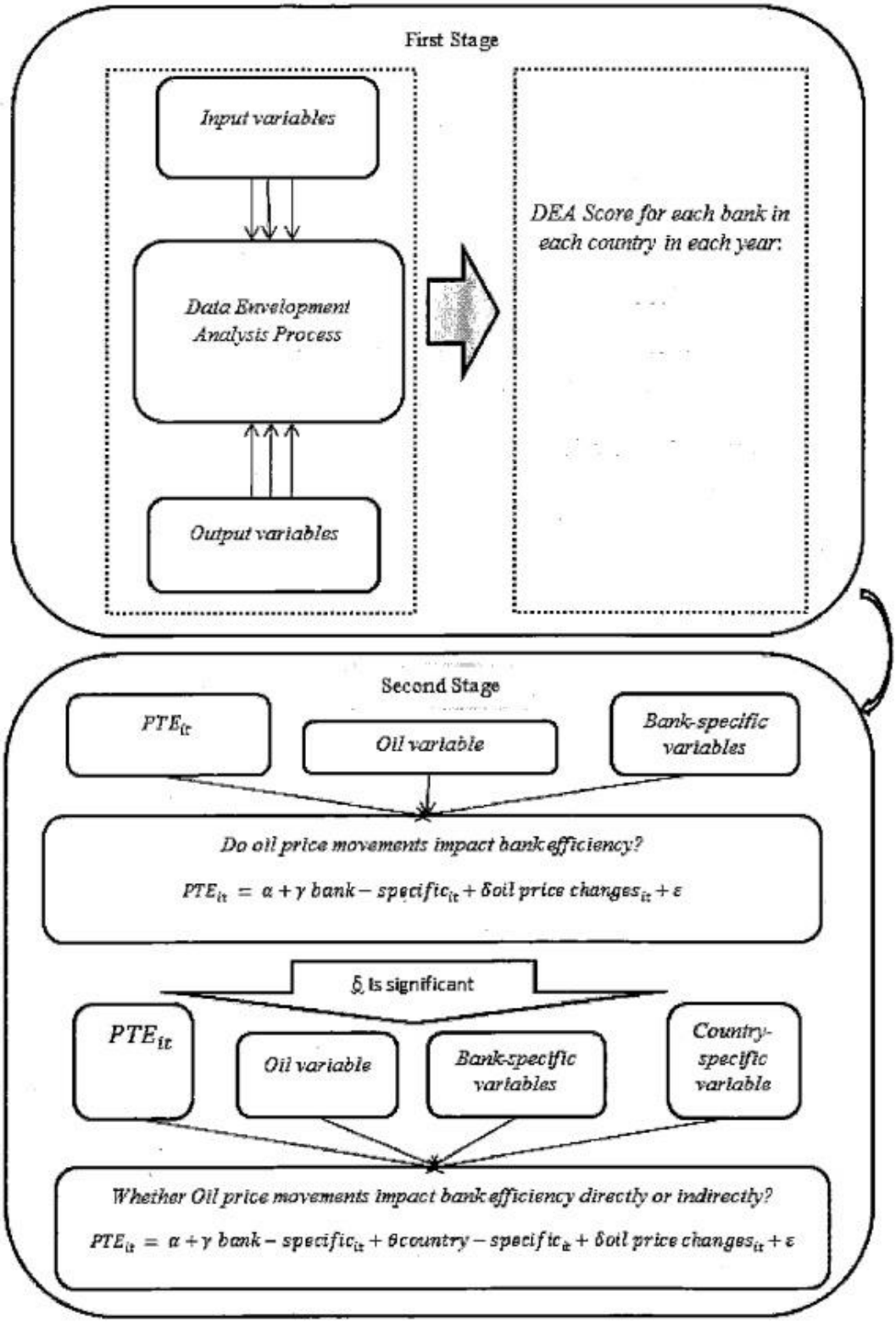


Figure 4-2) Detailed conceptual framework

Figure (4.3) shows the detailed two stage DEA approach, while the second stage has two phases. To the best of the researcher's knowledge having two phases in the second stage is novel in efficiency studies.

In DEA literature, different panel data techniques have been used in the second stage of DEA. Papers Table (4.1) illustrates the most commonly used ones.

Table 4-1) Survey of most popular econometric techniques used in second stage of two – stage DEA

Authors (Publication year)	Country	Period	Second stage panel data technique
Ataullah & Le (2006)	India	1992-1998	Ordinary least squares regressions
Avkiran (2009b)	Australia & New Zealand	1996-2003	Tobit
Aysan & Ceyhan (2008)	Turkey	1990-2006	General Least Square(FEM)
Brissimis et al. (2008)	10 new EU countries	1994-2005	Double bootstrap two-stage least squares truncated
Casu & Girardone (2004)	Italy	1996-1999	Logistic
Casu & Molyneux (2003)	France, Germany, Italy, Spain, UK	1993-1997	Bootstrap-Tobit
Chortareas et.al. (2012)	27 European countries		Truncated regressions and generalized linear models
Delis & Papanikolaou (2009)	10 new EU countries	1994-2005	Double Bootstrap
Dogan & Fauesten (2003)	Malaysia	1989-1998	General Least Square(FEM)
Drake et al. (2006)	Hong Kong	1995-2001	Tobit
Figueira et al. (2009)	Latin American		Ordinary least squares regressions
Fukuyama & Weber (2009)	Japan	2002-2005	Tobit
Fung (2006)	US	1996-2003	Ordinary least squares regressions
Gardener et al. (2011)	Indonesia, Malaysia, the Philippines, Thailand, and Vietnam		Tobit
Habibullah et al. (2005)	Malaysia	1988-1993	Granger causality
Isik & Hassan (2002)	Turkey	1988, 1992, 1996	General Least Square(FEM)

Authors (Publication year)	Country	Period	Second stage panel data technique
Isik (2007)	Turkey	1981-1990	General Least Square(FEM)
Kumar and Gulati (2008b)	India	1993-2006	Logistic regression
Kyj & Isik (2008)	Ukraine	1998-2003	General Least Square
Maudos et al. (2002)	10 EU countries	1993-1996	General Least Square(REM)
Molyneux et al., (2013)	Transition countries	1994-2002	General Least Square(REM)
Pasiouras (2008a)	95 countries	2003	Tobit
Pastor (2002)	Spain, Italy, France, Germany	1988-1994	Tobit, Logistic
Sanyal and Shankar (2011)	India	1997-2004	General Least Square
Sufian (2009)	Malaysia	1995-1999	Tobit
Sufian (2011)	Malaysia	1993-2006	General Least Square(FEM)
Tanna (2009)	75 countries	2000-2004	General Least Square(FEM)

As it is illustrated in the Table (4.1), in the second stage of a two stage DEA much regression modelling has been used. In this survey eight studies out of 27 applied the Tobit regression. The reason for using Tobit lies in the fact that since the efficiency scores are bounded between 0 and 1, the non-censored estimates will be biased. Ataullah and Le (2006) state that it is not necessary to use Tobit, and they transform the efficiency score by taking the natural logarithm of [efficiency score/ (1 - efficiency score)]. Casu and Molyneux (2003), among others, believe that the covariates in the second-step regression are obviously correlated with the one side error terms from the first-step. Thus they present a bootstrap approach. Brissimis et al. (2008) and Delis and Papanikolaou (2009) adopt an algorithm that uses a double bootstrap procedure to examine the determinants of efficiency in the new EU banking sectors. Some researchers apply other economic modelling in the second stage. For instance Pastor (2002) and Casu & Girardone (2004) used Logistic modelling while Habibullah et al. (2005) implied Granger causality.

One the most commonly used models in the two stages DEA is generalised least square (GLS) estimator. As it is illustrated in the above table, in 11 out of 27 studies when dealing with panel data in the second stage this model has been applied. In this study

followed the studies of Isik & Hassan (2002), Sufian (2011), Tanna (2009), General Least Square (GLS) will be applied in the second stage of DEA which the reason will be presented as follows.

The main challenge in panel data analysis is to address unobserved heterogeneity between individuals. One way to avoid this issue is to assume that all individuals are independently distributed across time. In this case, we can pool the data and use ordinary least square (OLS) regression. However, an assumption of independence in panel data is extreme, and invalid because of individual heterogeneity. In addition, the OLS estimator will be biased if there is unobserved heterogeneity. Overall, although modelling unobserved heterogeneity is difficult, it is one of the strengths of panel data which provides flexibility in modelling and dealing with unobserved heterogeneity.

The most widely used models for dealing with unobserved heterogeneity in static panel data is by using fixed-effects and random-effects estimators. This is a static panel data regression model

$$\boldsymbol{y_{it} = \beta_0 + \beta_1 x_{1it} + \cdots + \beta_k x_{kit} + \varepsilon_{it}} \qquad \textbf{Equation 4-14}$$

Where

$$\varepsilon_{it} = \alpha_i + u_{it}$$

Where each x_{it} represents an explanatory variable, each β represents the coefficient of each parameter and βs are assumed to remain constant over time, α_i is the time-constant individual specific effect, and u_{it} is the idiosyncratic disturbance term that is independent across individuals. Also it has been assumed that u_{it} has zero mean and constant variance.

In this case, estimating pooled panel data using an OLS estimator means that it has been assumed that $\alpha_i = 0$ and, therefore, it is uncorrelated with the x's. However, this assumption is usually invalid and makes the OLS biased, as α_i is a component of the error term. In general, there are three popular ways to remove the time-constant individual specific component, α_i, from the error term. The first method is by taking the first difference transformation:

$$\boldsymbol{y_{it} = \beta_0 + \beta_1 x_{1it} + \cdots + \beta_k x_{kit} + \alpha_i + u_{it}} \qquad \textbf{Equation 4-15}$$

$$\boldsymbol{y_{it-1} = \beta_0 + \beta_1 x_{1it-1} + \cdots + \beta_k x_{kit-1} + \alpha_i + u_{it-1}} \qquad \textbf{Equation 4-16}$$

⇨ $\Delta y_{it} = \beta_1 \Delta x_{1it} + \cdots + \beta_k \Delta x_{kit} + \Delta u_{it}$

Therefore, there is no more correlation between the Δu_{it} and Δx's under the assumption of strict exogeneity and the model can be estimated with an OLS estimator. The OLS estimator in this model is known as the first-differenced estimator, or a fixed-effects estimator.

Another method is to eliminate the individual fixed effects in using the Least Square Dummy Variable (LSDV) model. In this methodology, one intercept dummy is allocated to each individual as below

$$\boldsymbol{y_{it} = \beta_0 + \gamma_1 D_1 + \cdots + \gamma_{N-1} D_{N-1} + \beta_1 x_{1it} + \cdots + \beta_k x_{kit} + u_{it}} \quad \textbf{Equation 4-17}$$

where Di is the intercept dummy allocated to each individual and yi(gamma) is the corresponding coefficient for each intercept dummy. This equation can be estimated by an OLS estimator. One advantage of the LSDV estimator over first-difference estimator is that is it can be implemented on unbalanced panels. However, it can be very computation intensive when the number of individuals, N, is large.

The most popular method to remove the fixed effects is to use a time-demeaning transformation, also known as fixed-effects transformation. In this case, we first average the main equation over time and then subtract it from the main equation.

$$\boldsymbol{y_{it} = \beta_0 + \beta_1 x_{1it} + \cdots + \beta_k x_{kit} + \alpha_i + u_{it}} \quad \textbf{Equation 4-18}$$

$$\boldsymbol{\bar{y}_i = \beta_0 + \beta_1 \bar{x}_{1i} + \cdots + \beta_k \bar{x}_{ki} + \alpha_i + \bar{u}_i} \quad \textbf{Equation 4-19}$$

$$\boldsymbol{(y_{it} - \bar{y}_i) = \beta_1 (x_{1it} - \bar{x}_{1i}) + \cdots + \beta_k (x_{kit} - \bar{x}_{ki}) + (u_{it} - \bar{u}_i)} \quad \textbf{Equation 4-20}$$

This model can be estimated by an OLS estimator and is called the fixed effects estimator or the within estimator. Similarly, the crucial assumption here is the exogeneity of transformed x's with the transformed error terms.

So far, in the Fixed Effect models (FE), it will be assumed that x's are correlated with the individual specific effects. However, it is not always the case. In this case, the OLS estimator will be consistent but inefficient as the error terms will be serially correlated. In the same linear regression model:

$$\boldsymbol{y_{it} = \beta_0 + \beta_1 x_{1it} + \cdots + \beta_k x_{kit} + \alpha_i + u_{it}} \quad \textbf{Equation 4-21}$$

It has been assumed that α_i has zero mean and constant variance.

$$\boldsymbol{E(\alpha_i) = 0 \; and \; \sigma_\alpha^2 = Var(\alpha_i)} \quad \textbf{Equation 4-22}$$

$$\boldsymbol{E(u_{it}) = 0 \; and \; \sigma_u^2 = Var(u_{it})} \quad \textbf{Equation 4-23}$$

In this case, the error term will be serially correlated because

$$\boldsymbol{Cov(\varepsilon_{it}, \varepsilon_{is}) = \sigma_\alpha^2/(\sigma_\alpha^2 + \sigma_u^2)} \quad \textbf{Equation 4-24}$$

and the error term, u_{it}, is assumed to have zero mean and constant variance

In order to deal with this issue, a quasi-demeaning transformation has been used as below

$$\boldsymbol{y_{it} = \beta_0 + \beta_1 x_{1it} + \cdots + \beta_k x_{kit} + \alpha_i + u_{it}} \quad \textbf{Equation 4-25}$$

$$\boldsymbol{\bar{y}_i = \beta_0 + \beta_1 \bar{x}_{1i} + \cdots + \beta_k \bar{x}_{ki} + \alpha_i + \bar{u}_i} \quad \textbf{Equation 4-26}$$

$$\gamma(y_{it} - \bar{y}_i) = \beta_0(1-\gamma) + \beta_1(x_{1it} - \gamma\bar{x}_{1i}) + \cdots + \beta_k(x_{kit} - \gamma\bar{x}_{ki}) + (u_{it} - \gamma\bar{u}_i) \quad \textbf{Equation 4-27}$$

where $\gamma = 1 - [\sigma_\alpha^2/(\sigma_\alpha^2 + \sigma_u^2)]^{\frac{1}{2}}$ and varies between 0 and 1. This transformation removes the serial correlation among error terms and the equation can be estimated by a feasible generalised least square (GLS) estimator. This model is called a Random Effects (RE) estimator. The smaller the variance of individual effects, the closer it will be to the OLS estimator, where $\gamma = 0$. The larger the variance of individual effects, the closer it will be to the fixed-effect estimator, where $\gamma = 1$. In order to test which of the fixed-effects or random effects model fits better to the data, Hausman's (1978) test will be used.

In explaining how Hausman test works, following linear and static panel model has been considers

$$y_{it} = \beta x_{it} + \mu_i + \varepsilon_{it}$$

where subscripts $i = 1,2,\ldots,N$ and $t = 1,2,\ldots,T$ denote individual and time, respectively; x_{it} is a vector of explanatory variables and β is a vector of coefficients to be estimated; and μ_i is the unobserved individual specific. The main challenge in static panel data analysis is employing an appropriate specification to model the unobserved individual specific effect. In this regard, fixed-effects models and random effects

models, as the most popular static models, adopt different techniques to account for individual specific effects in the panel data. Fixed-effect models assume that the individual-specific effects are non-random and include one intercept dummy variable in the equation per unit while random effect models assume that individual specific effects are random.

Accordingly, the main question that a researcher faces is the choice between fixed effects models and random effects models. Although previous studies have provided often contradictory and inconclusive advice on this matter (see e.g. Wooldridge (2010) and Gelman and Hill (2007)), this question can be answered from two different point of view. From an econometric standpoint, researchers can conduct a test proposed by Hausman (1978) to decide between random effects and fixed effects models. The null hypothesis under the Hausman test is that random effects model is appropriate i.e. individual specific effects are uncorrelated with explanatory variables. In this context, if the null hypothesis is rejected, the use of random effects model results in biased estimated parameters. In such cases, fixed-effects models are superior and the estimated coefficients will be unbiased.

Furthermore, the choice between random effects and fixed effects models can also be answered from economic point of view. Random effect models are more appropriate when the sample under consideration is randomly taken from a large population whereas in fixed effects model better serve samples that represent a large portion of the population.

In this research, fixed effects model has been used as the sample represents majority of banks in MEOE countries and also the Hausman test results favour using the fixed effects model. However, it should be noted that using random effects model will not qualitatively affect the empirical findings.

4.2 Main Research Variable

Two groups of variables have been used in this research to analyse the impact of oil price movement on the performance of banks. The first category consists of only one variable, oil revenue which been proxy by the dependency of a country on oil income. The second group are oil price changes proxies which include real oil price increase, positive and negative oil price shocks and positive and negative oil price volatility.

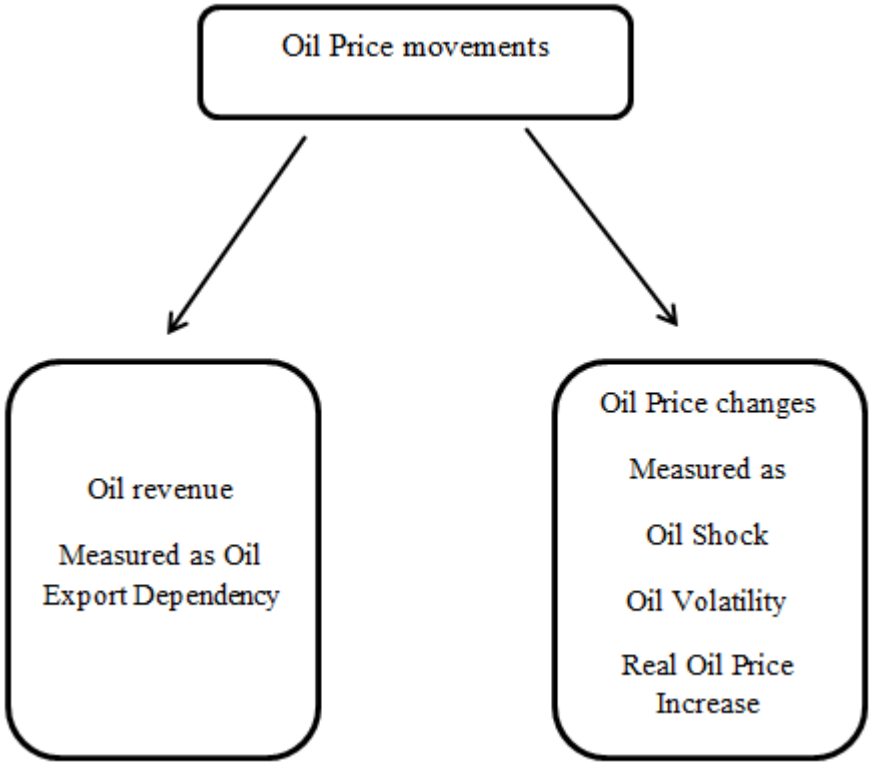


Figure 4-3) Oil price movements variables

Figure (4.4) illustrates the two groups of oil price movement variables. Following sections definition and mathematical formulation of each of these variables will be explained.

4.2.1 Oil revenue

The first category of oil price movement variables in this research is oil revenue which is measured as the degree of dependence to oil income, which is a ratio of oil export revenue to GDP.

Kaya (1990) followed by Bhattacharyya and Blake (2010) present the components of oil export dependency (OED) as follows:

$$\boldsymbol{OED} = \frac{\boldsymbol{OER}}{\boldsymbol{GDP}} = \frac{\boldsymbol{OER}}{\boldsymbol{OEV}} \times \frac{\boldsymbol{OEV}}{\boldsymbol{POS}} \times \frac{\boldsymbol{POS}}{\boldsymbol{GDP}} \qquad \textbf{Equation 4-28}$$

In this equation, OER is the oil export revenue (in constant US dollar terms); GDP the Gross Domestic Product (in constant US dollar terms); OEV the oil export volume; POS the primary oil supply and PEC the primary energy consumption.

4.2.2 Oil price changes

Second group of oil price movement consists of three definitions; oil price shock, oil price volatility and net oil price increase which each of these proxies have been discussed in flowing sections.

Oil price shocks

The asymmetric specification proposed by Mork (1989) distinguishes between positive and negative oil price change. Oil price change is defined as follows**:**

$$\boldsymbol{ROILP_t+ = max\left(0, (\, lnoilp_t - ln\, oilp_{t-1})\right)} \qquad \textbf{Equation 4-29}$$

$$\boldsymbol{ROILP_t- = min\left(0, (\, lnoilp_t - ln\, oilp_{t-1})\right)} \qquad \textbf{Equation 4-30}$$

Where ln $oilp_t$ is the real price of oil at time t, $ROILP^+$ is a positive oil price growth rate, $ROILP_t^-$ is a negative oil price growth. Mork demonstrates that in the response to oil price increases and decreases there is an asymmetry. Thus, this oil proxy has been used widely in research studies considering the effect of oil price shock on macroeconomic variables

Oil price volatility

The generalized autoregressive conditional heteroskedasticity model has been used by Lee et al. (1995) to measure the oil price volatility which reflects an unanticipated component of real oil price movement. The Generalized Autoregressive Conditional Heteroskedasticity is used for asserting the best predictor of the variance in the next

Period. GARCH (1, 1) model was used as follows:

$$\Delta \boldsymbol{oil_t} = \boldsymbol{\alpha} + \sum_{j=1}^{k} \boldsymbol{\beta_j}\, \Delta \boldsymbol{oil_{t-1}} + \boldsymbol{\varepsilon_t} \qquad \boldsymbol{\varepsilon_t \mid I_t \rightarrow N\,(0, h_t)} \qquad \textbf{Equation 4-31}$$

$$\boldsymbol{h_t} = \boldsymbol{\gamma_0} + \boldsymbol{\gamma_1} + \boldsymbol{\varepsilon_{t-1}^2} + \boldsymbol{\gamma_2 h_{t-1}} \qquad \textbf{Equation 4-32}$$

$$\mathbf{OILVOL_t + = max}\left(\mathbf{0}, \frac{\varepsilon t}{\sqrt{ht}}\right) \qquad \textbf{Equation 4-33}$$

$$\mathbf{OILVOL_t - = min}\left(\mathbf{0}, \frac{\varepsilon t}{\sqrt{ht}}\right) \qquad \textbf{Equation 4-34}$$

To model the asymmetric effects of oil price movement, Lee et al. (1995) in define the oil price change proxy (OILVOL) for positive ($OILVOL_t^+$) and negative ($OILVOL_t^-$) oil price

volatility, where $OILVOL_t^+$ contains all the positive values of OILVOL and zero replaces negative values and $OILVOL_t^-$ contains all negative values of OILVOL with positive values replaced by zero.

Net Oil price Increase

Yearly changes in real oil price, which is simple log of the real oil price gives

$$\Delta OIL_t = Ln\, OIL_t - Ln\, OIL_{t-1} \qquad \textbf{Equation 4-35}$$

4.3 Software

In the first stage of this research in order to obtain efficiency scores SaaS software is applied. In the second stage of research Stata software has been used to analysis the impact of oil variables and contextual variables on bank efficiency. Stata statistical software is a complete, integrated statistical software package that provides everything you need for data analysis, data management, and graphics. Stata puts hundreds of statistical tools at user's fingertips, from advanced techniques, such as dynamic panel data regressions, generalized estimating equations (GEE) to standard methods, such as linear and generalized linear models (GLM), regressions with count or binary outcomes.

4.4 Summary Chapter

This chapter presents the conceptual framework and research approach which were produced from the theories and ideas which arose from the literature review and banking measurement models. Conceptual framework of research consists of two stages. The first stage of framework will apply the different non-parametric DEA techniques of obtaining efficiency under standard efficiency and Super efficiency.

In the second stage, the researcher has applied two groups of oil variables (oil price changes and oil revenue) along with contextual variables and attempted to design a framework to find out if oil price changes affect bank efficiency and, if yes , directly or indirectly. If the relationship is indirect, it means that changes in the price of oil impact bank efficiency through macroeconomic channels. This will be done by applying a proper technique to analyse the result of the second stage. Considering non-persistency of dependent variables and unbalanced panel data, in addition to close examination of the existing studies' fixed effect technique has been applied in the second stage.

Chapter 5 DATA AND DATA ANALYSIS

This research has set out to achieve two objectives: first, to find out about bank efficiency and second to figure out how oil price movement affects bank efficiency. One of the main tasks of this research is to measure and compare the efficiency in MEOE banking industries using Data Envelopment Analysis. The other main task is to analyse the impact of oil price changes on bank efficiency considering the impact of exogenous environmental variables as well.

In this chapter the selected input and outputs to achieve efficiency scores, contextual variables (bank-specific and country-specific variables) to control for environmental effects and the main variables, which are oil price movement variables, will be discussed and how database information was applied to achieve these data will be explained. In preparation for this analysis sample data had to be constructed.

The researcher is interested to select banks operating in the Middle Eastern Oil Exporting countries for the following reasons. Firstly, the banking industries of these countries are home to most of the Islamic banks in the world so it is a good sample for studying the impact of oil price movement on the performance of banks with different operational styles. Secondly, these countries are major oil exporters in the world energy market and the performance of their industries may be susceptible to oil price movement. Finally, oil income injected into the economies of these countries makes these countries very promising region for international portfolio diversification. Therefore, this study for the first time will identify the impact of oil income and oil price movement on the efficiency of banks operating in the Middle Easter oil exporting countries. A new term “MEOE” countries will be defined which refers to the Middle East Oil Exporting countries

5.1 Sample of Research

Operating commercial, Islamic and investment banks from eight countries which are all oil exporting (listed as Bahrain, Iraq, Iran, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates) are included in this study. Based on generally accepted accounting principles (GAAP), annual unconsolidated bank data from 2000 to 2011 are collected from the BankScope database that provides detailed financial information for over 30,000 banks globally. Accounting data are compared across the whole sample since the financial statements data obtained from BankScope are reported in a unified

global format. In this research only those banks that have consecutive observations for at least five years in the period 2000-2011 were considered. Table (5.1)shows the number of observations per country in the sample over the 2000-2011 period and Table (5.2) illustrates the number of banks in each country and categorizes them by operational style (commercial, investment and Islamic). Table (5.1) shows that data for Iraq banking industry is not available before 2005. For Iran, also data is not available for 2011. One of the findings from observing the data for providing this sample is the small number of banks in Iran which is a geographically wide-spread country compared to Oman and Qatar which are comparatively small countries. The number of Omani banks in the sample is six and for the number of Qatari banks is ten, while this number for Iranian banks is eight. In Iran many private banks have been recently established which they do not have consecutive data for five years. Moreover, as a result of recent sanctions on banks, the BankScope database does not contain their statements. Another issue is that there is a huge number of banks in Kuwait which were operating under an operational style other than the commercial, investment and Islamic such as specialized governmental credit institute, investment and Trust Corporation.

Table 5-1) Total number of banks over research period

Year	Bahrain	Iraq	Iran	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	7	N/A	3	6	5	6	8	17
2001	7	N/A	4	6	5	7	8	17
2002	7	N/A	5	6	5	7	8	18
2003	9	N/A	5	6	5	7	10	18
2004	10	N/A	5	6	5	7	11	19
2005	15	5	5	8	5	7	12	20
2006	17	8	6	7	5	7	12	21
2007	21	9	8	8	6	9	13	22
2008	21	9	8	8	6	9	13	22
2009	20	9	8	8	6	8	13	22
2010	19	8	8	8	6	8	13	21
2011	19	7		6	6	7	13	19
Total	172	53	67	83	65	89	134	236

Source: *BankScope*

Table (5.2) shows that the sample ends up with an unbalanced panel data set consisting of 98 banks which has been reported as: 51 commercial banks, 35 Islamic banks and 12 investment banks. As it is shown, while United Arab Emirates followed by Bahrain has the largest number of observations in the sample, Iraq, Iran and Oman have the smallest

number of observations in the sample. Therefore, it ends up with an unbalanced panel data set consisting of 899 observations. The detailed sample of observation has been reported in appendix (A).

Table 5-2) Number of banks operating under different operational style in sample

Country	no. of banks	Commercial banks	Investment banks	Islamic banks
Bahrain	21	7	5	9
Iraq	9	4	3	2
Iran	8	0	0	8
Kuwait	9	6	0	3
Oman	6	6	0	0
Qatar	10	6	0	4
Saudi Arabia	12	7	2	3
UAE	23	15	2	6
Total	98	51	12	35
BankScope				

Although the sample data set does not include all the banks of the individual countries; however it covers all the banks with five years consecutive data available. The total number of MEOE banks according to BankScope is 206 banks of which 135 banks are operating under operational styles commercial, investment and Islamic. The other banks operate under other styles such as real estate & mortgage banks, multi-lateral government banks, specialized governmental credit institutes, investment and trust corporations and some of these styles are only applicable in one or two country. Therefore, the most common styles were selected for this research and these are commercial, investment and Islamic. Out of 135 banks performing under these three styles, 98 banks with at least five years consecutive data have been selected. Thus, the sample covers nearly 72% of commercial, investment and Islamic banks operating in MEOE countries. The measurement of banking performance and efficiency from using this sample will reflect the magnitude of the banking activity of those oil exporting Middle East countries and gives the researcher a full picture of how well the whole banking system is running.

5.2 Dependent variable: Efficiency

The efficiency variable is measured using inputs and outputs specified according to the intermediation approach. As discussed in section 2.6 there is no consensus about which approach should be adopted to define inputs and outputs. However, the intermediations

approach views banks as financial intermediaries, collecting funds from investors and loaning them out (Berger and Humphrey, 1990; Yue, 1992). The following sections 2.6 and 2.7 by adopting the intermediation approach input and output specifications according to the data definition of BankScope database are defined as:

Inputs:

1. **Fixed Assets**: is the traditional proxy input measure used in intermediation, production approaches of banking efficiency. Fixed assets are a combination of property, plant and equipment.

2. **Total Deposits, Money Market and Short-term Funding**: is the sum of total customer deposits plus deposits from banks plus other deposits and short-term borrowings

3. **Total Equity**: is common equity plus non-controlling interests, plus securities revaluation reserves, plus foreign exchange revaluation reserves, plus other revaluation reserves.

Outputs:

1. **Net Income**: is equal to pre-taxed profit – taxes. Pre-taxed profit is equal to operating profit plus non-recurring income minus non-recurring expenses plus other non-operating income and expenses.

2. **Loans:** is the sum of different loans' maturity granted by the bank

Detailed data of input and output variables and descriptive statistics of these data have been illustrated in appendices (B) and (C). Figures (5.1) to (5.5) summarize these analyses by boxplots. These boxplots have been calculated by values of 25 percentile, 75 percentile, median, maximum and minimum of each variable in each country. The tables of these values are presented in appendix (D).

In Figure (5.1) the lower whiskers of the boxplot shows that the monitored minimum amount of deposits for the banking systems in all countries are very small. The upper whiskers illustrate the largest amount of deposits belonging to a bank in Saudi Arabia followed by UAE and Iran (thousand USD 69,172,563.61, thousand USD 60,432,701.78, thousand USD 51,185,839.85 respectively)[2]. The size of boxes for Iran

[2]) Appendix (D)

and Saudi Arabia show that the middle range of the banks in these two countries have deposit values between thousand USD 5,000,000 to thousand USD 22,000,000. On the other hand, seventy five per cent of deposit values for banks in Bahrain and Iraq are less than thousand USD 2,500,000 and thousand USD 300,000 respectively. Another point which is apparent from Figure (5.1) is that the banks' deposit values for all the banking industries in this research are positively skewed.

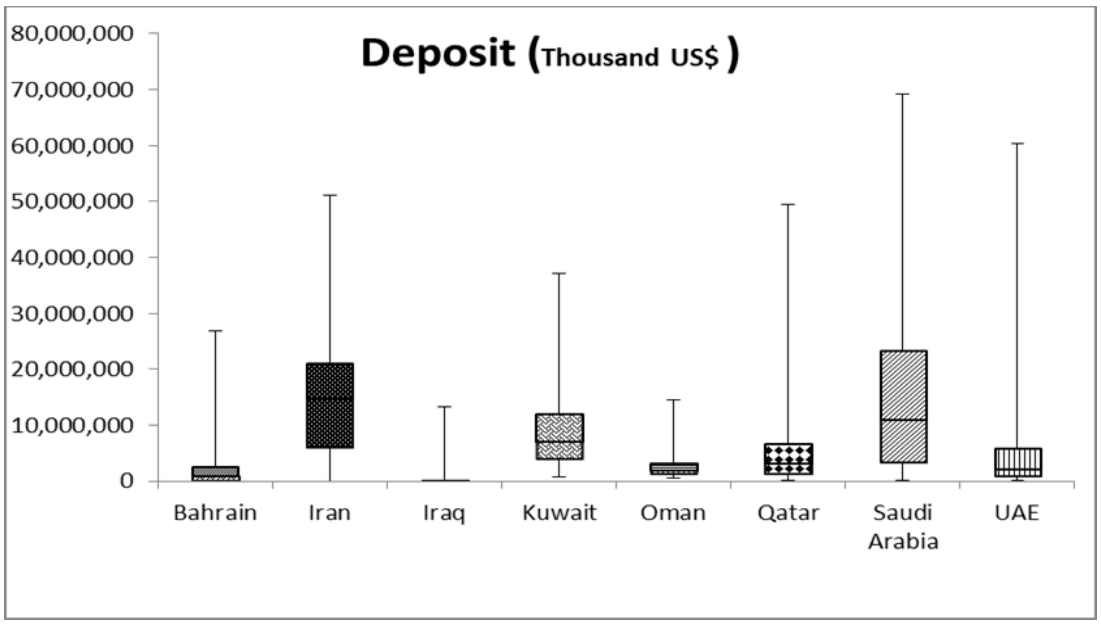


Figure 5-1) Deposit boxplot for banking industries in MEOE countries

Figure (5.2) shows boxplots of the fixed asset variable for the banking industry of MEOE countries during 2000-2001. The boxplots of this figure like figure (5.1) are not cantered between whiskers and the boxes are shifted significantly to the lower end. Thus, this variable for each country's banking system is positively skewed. The interquartile range of all boxes except for Iran is small which signifies a distribution with a thin peak of fixed assets in the banking industry of each of these countries. For instance, inter quartiles of fixed asset values for banks in Bahrain, Iraq and Oman are less than nearly 50,000 thousand USD which is very small compared to the ones of Iran (1,258,000 thousand USD)[3]. The Kuwait banking industry, although experiencing the highest value of fixed assets among all the banks in the sample[4], has a median of this value of 2,753,051 thousand USD) [5]which is actually closer to the lower end of the range of values.

[3]) Appendices (B) and (D)
[4])*ibid*
[5])*ibid*

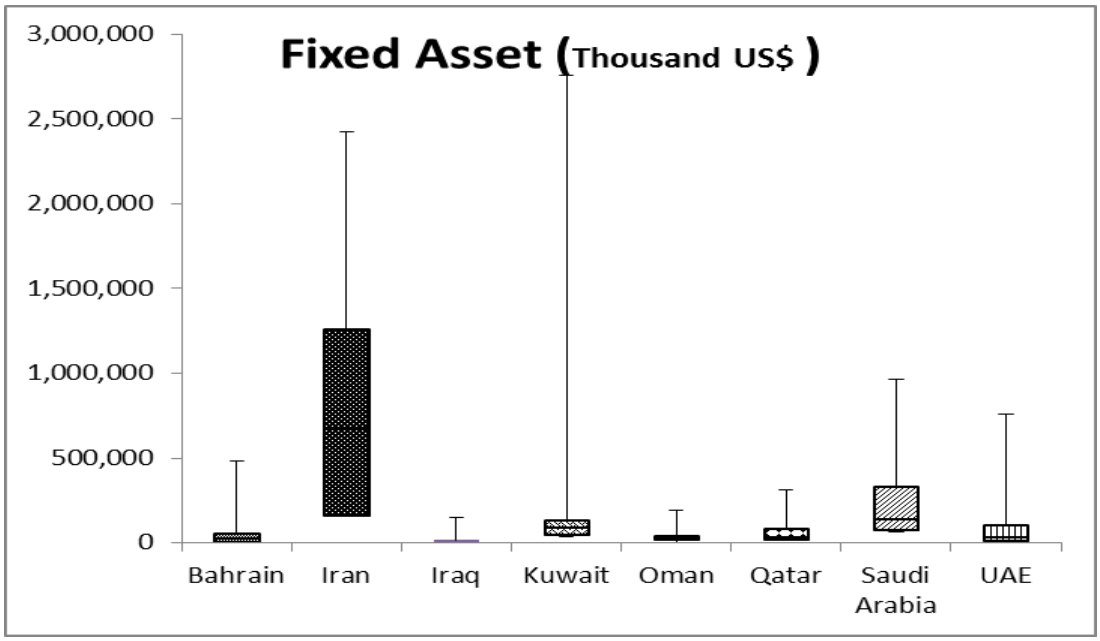


Figure 5-2) Fixed asset boxplot for banking industries in MEOE countries

Boxplots of the Equity variable illustrates that UAE and Saudi Arabia have the highest amount of equity in the sample (Emirates NBD PJSC, 2011 with 9,525,146.24 thousand USD and National Commercial Bank, 2011 with 9,489,413.83 thousand USD respectively) while the lowest amount of equity has been reported for an Iraqi bank (North bank, 2005)[6]. Although the highest value of equity is recognized for a Saudi Arabian bank with a considerable difference to the highest value of equity in other banking industries, it is obvious that there is not too much difference between the median value of this variable for Saudi's banks and other countries banks.

6) *ibid*

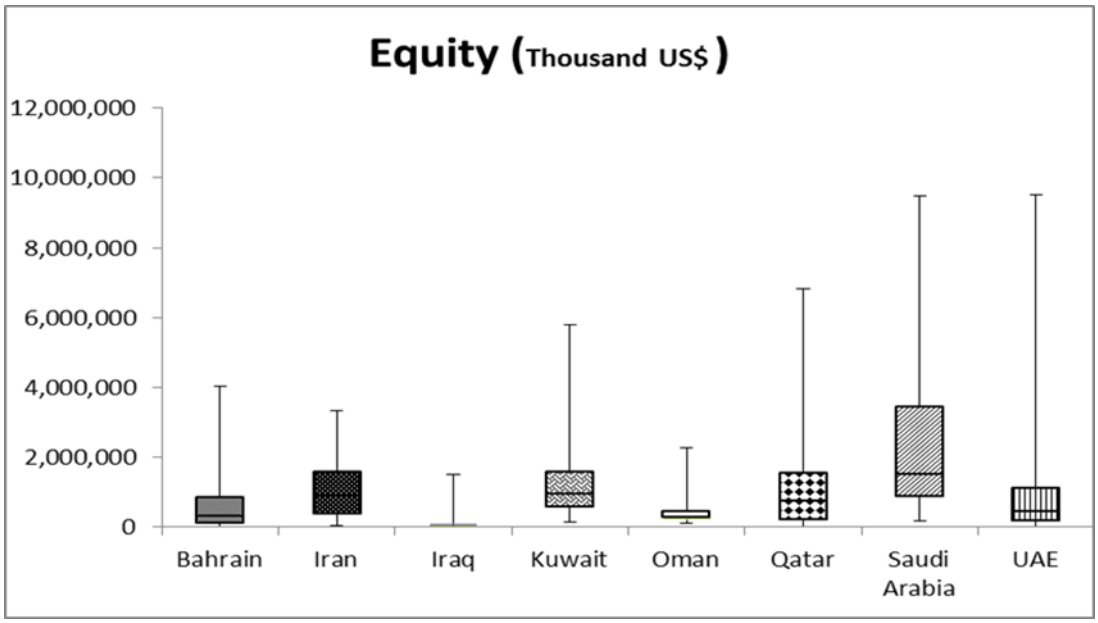


Figure 5-3) Equity boxplot for banking industries in MEOE countries

Comparing boxplots of these three input variables shows that for the Iranian banking system, although deposits and fixed assets have a distribution with a wider peak compared to other banking systems, however, the distribution of equity within banks of this country signifies a high peak. This means that there is no parallel distribution between deposit, fixed asset and equity in the Iran banking industry. The same concern exists for the Saudi Arabian banking system. While 50 per cent of banks' deposit and equity are contained within a big segment of Saudi's bank sample, 50 per cent of Saudi's banks' fixed asset is located within a small segment.

Figure (5.4) illustrates the boxplots for the net income variable in MEOE countries. The most obvious point of comparison between this figure and other figures is the negative values of net income which indicates profit loss. The banking systems in Bahrain, Kuwait, Oman, Saudi Arabia and UAE include banks with loss profit. For some banks this loss is up to thousand USD[7] 1,302,772 (Gulf Bank KSC, 2008). Boxes for Bahrain, Kuwait, Oman and Saudi Arabia show the net income variable for the sample of banks of these countries provides a normal distribution while for Iran, Iraq, Qatar and Saudi Arabia the net income is skewed positively. Although Kuwait, Bahrain, Saudi Arabia and UAE banking industries have negative values for net income but median values of this variable for all banking systems are positive. Figure (5.4) in addition indicates that the highest net income value has been experienced by a Saudi Arabian bank (Al Rajhi

[7] - *ibid*

Banking & Investment Corporation-Al Rajhi Bank, 2011) followed by a Qatari bank (Qatar National Bank, 2010). [8]

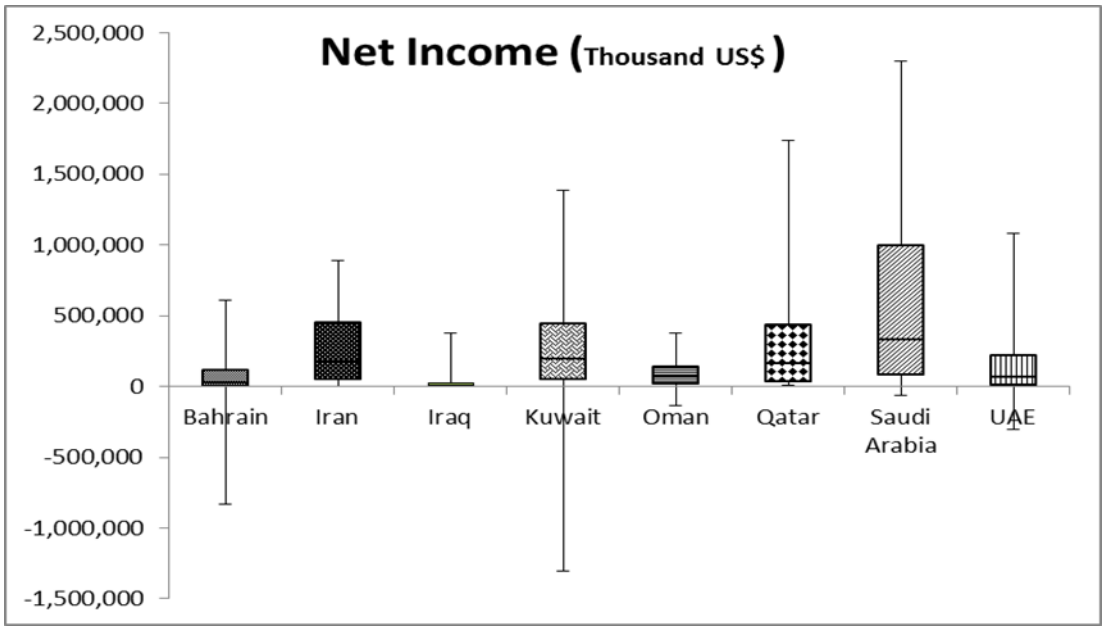


Figure 5-4) Net income boxplot for banking industries in MEOE countries

Boxplots of the second output variable have been presented in Figure (5.5). This figure illustrates that the Iranian and Saudi Arabian banking systems have the widest inter quartile of loans values. This interval for Iraq is less than 100,000 thousand USD[9].

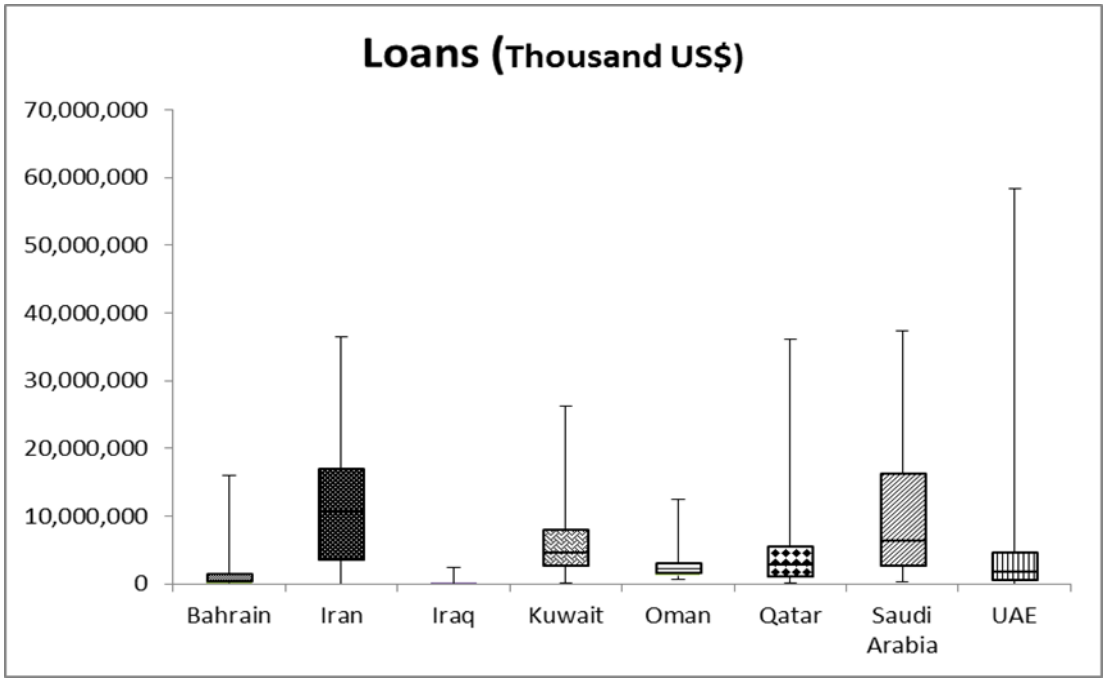


Figure 5-5) Loans boxplot for banking industries in MEOE countries

[8] - *ibid*

[9] - *ibid*

Another interesting statistical analysis is to look at the mean of each variable. Figures (5.6) to (5.8) illustrate the means of input variables.

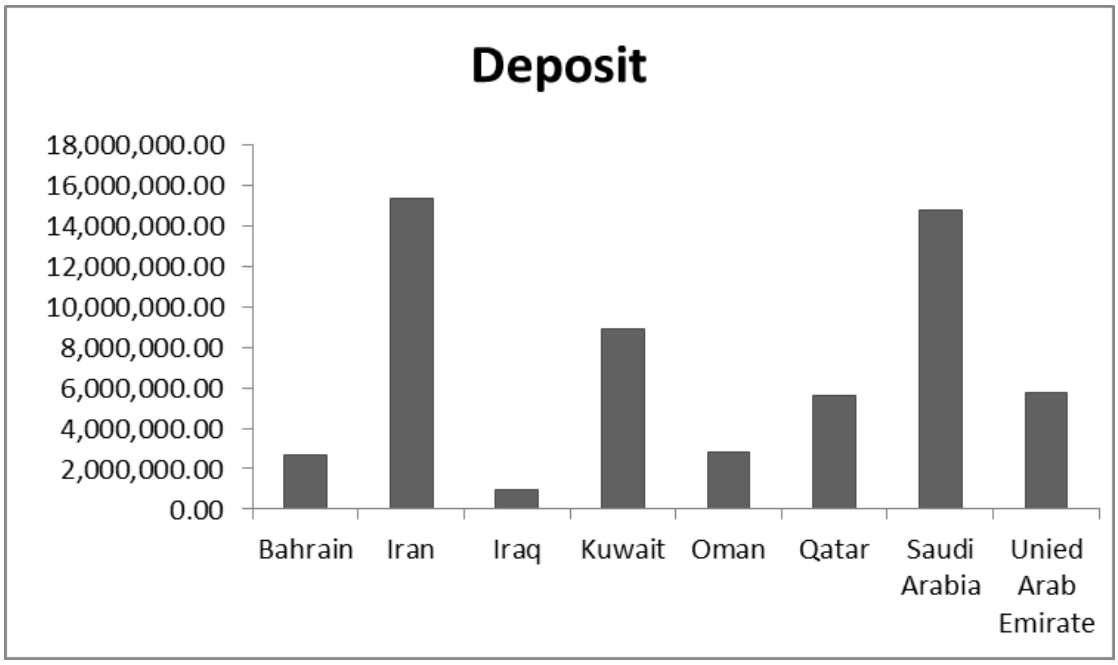


Figure 5-6) Mean of deposit of banking industry of MEOE countries

As it is illustrated in Figure (5.6), Iran and Saudi Arabia have the highest average of deposit among all of these countries. These two countries are followed by Kuwait with significant difference. The average deposit of Iran is 1.71 times of the average deposit of Kuwait and this figure is 1.65 of the average deposit of Saudi Arabia. However, the Iraqi banking industry is experiencing the lowest mean of deposit. The average deposit for Iraq is six per cent of the average deposit in the Iranian banking system.

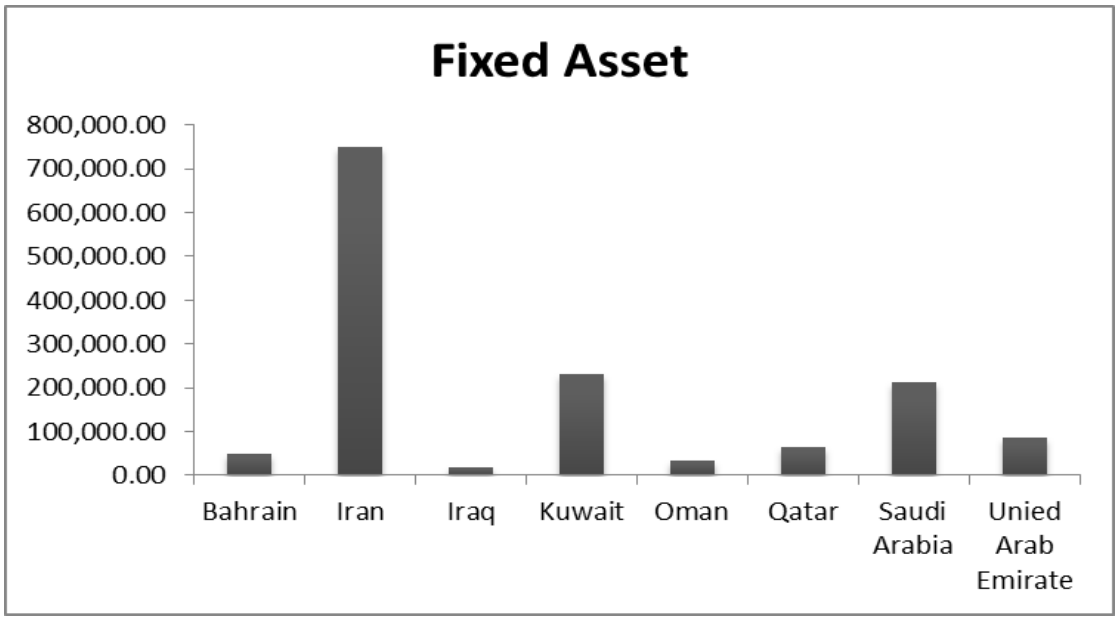


Figure 5-7) Mean of fixed asset of banking industry of MEOE countries

Considering the fixed assets, again the Iranian banking system has the highest value of fixed asset followed by the Saudi Arabian and Kuwaiti banking systems with a difference of nearly 500 million $USD. The Iraqi and Omani banking industries have the lowest value of average fixed assets which stand respectively as 2.5 and 4 per cent of Iran's.

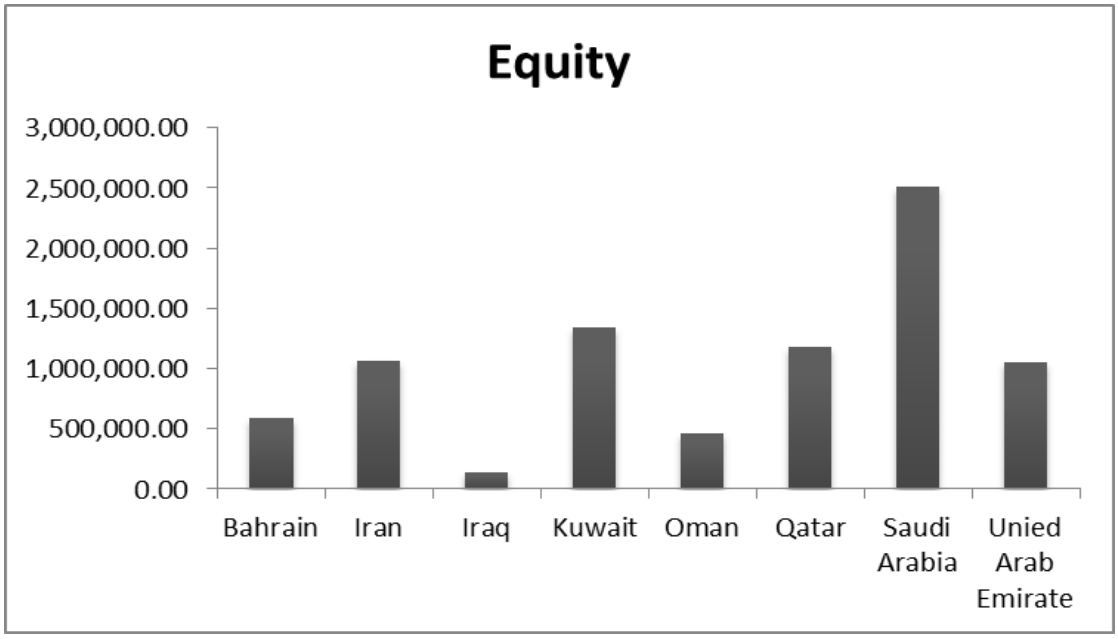


Figure 5-8) Mean of equity of banking industry of MEOE countries

Figure (5.8) shows it is the Saudi Arabian banks which have a highest value of the mean of equity. The equity of the Iranian banking system, by average, is less than half of the Saudi ones. Even the mean of equity over the period of this research for Kuwaiti and Qatari banks is higher than for the Iranian banks.

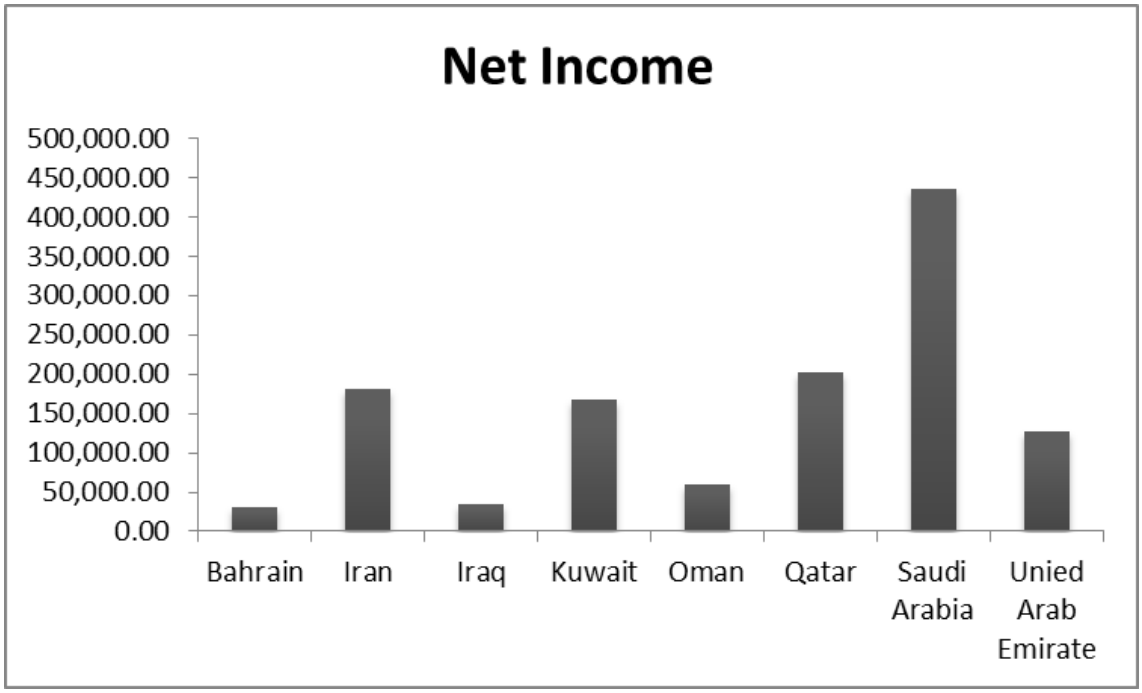


Figure 5-9) Mean of NET INCOME of banking industry of MEOE countries

Figures (5.9) and (5.10) show the mean of output variables. The Saudi Arabian banking system has the highest mean of net income followed by the Iranian banking system. On the other hand, the Bahraini and Iraqi banking systems have the lowest mean of net income.

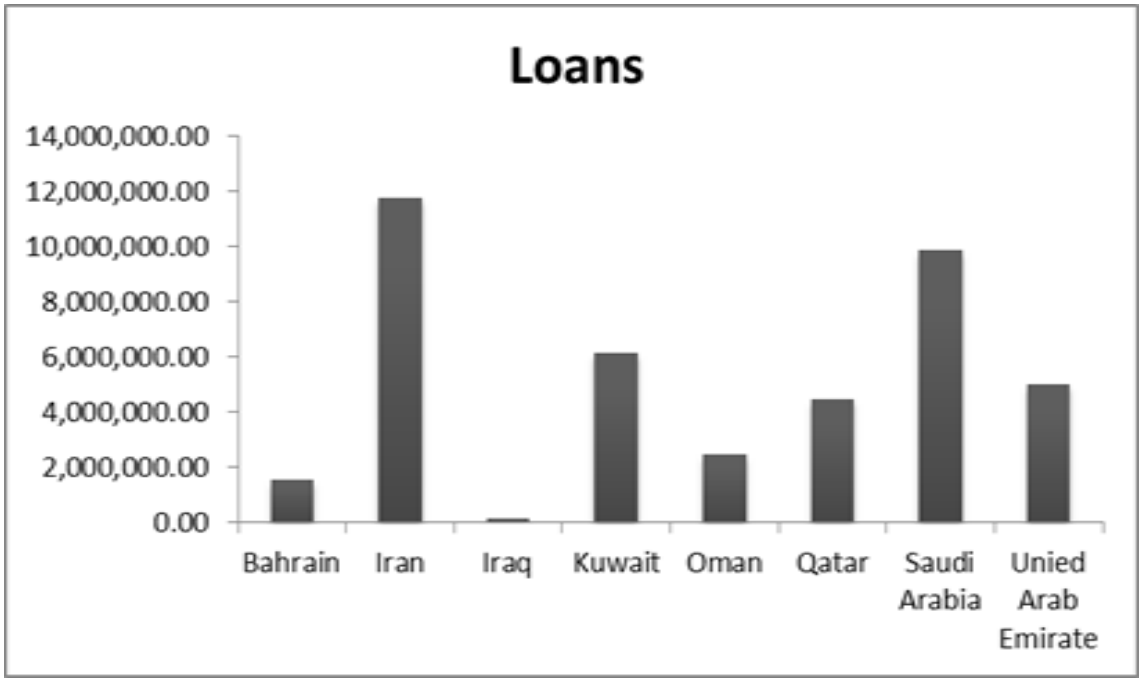


Figure 5-10) Mean of loans of banking industry of MEOE countries

Banks use deposit sources for providing loans to customers, thus it is expected that the banking system with higher mean of deposit has the greater amount of loans paid. The

Iranian banking system deposits on average has the highest amount followed by Saudi Arabia among all of the countries' banking systems. As Figure (5.10) illustrates banks operating in Iran followed by Saudi Arabia have the highest level of the mean of loans.

The input and output variables used in this research to measure bank efficiency scores which are based on one common frontier rather than separate frontiers for each country. Both approaches have been used in the literature. Since these countries are mostly using a reasonable degree of homogeneity in their banking systems and technology, a common frontier has been followed (More details have been provided in section 6.1). Therefore, all inputs and outputs have been pooled in order to build an efficient frontier. The following table illustrates the descriptive analysis of input and output variables as a pooled data sample.

Table 5-3) Descriptive analysis of input and output variables (in Thousand USD)

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Inputs					
Deposit	7,007,599	2,679,238	10,225,453	3,630	69,172,564
Fixed Asset	151,290	43,365	325,884	27	2,753,051
Equity	1,128,986	592,900	1,519,967	7,458	9,525,146
Outputs					
Net Income	159,489	68,068	286,736	-1,302,772	1,967,547
Loans	5,170,535	2,100,885	7,871,008	108	58,438,202

Table (5.3) shows three inputs and two outputs, these variables vary over the period of study, the minimum value of fixed asset is an input is 27.22 thousand USD whereas the maximum value is 2,753,051 thousand USD with an average of 151,290.26 thousand USD and a standard deviation of 325,884.19 thousand USD. The same thing applies to the other variables, take for example the net income, the minimum net loss is 1,302,772.23 thousand USD, and the maximum value is 1,967,546.77 thousand USD, with an average of 159,489.46 thousand USD and a standard deviation of 286,735.73 thousand USD. This variation and the high standard deviation for all the variables respectively reflect the heterogeneity among the selected banks. Given the long period of analysis and eight countries which sample of banks have been situated , it is expected that such variation will be found, therefore, since DEA Models are sensitive to observation it is likely that significant levels of variation in the efficiencies will be found as well.

5.3 Independent variables

The impact of environmental variables on banking efficiency analysis has been discussed in section 3.1.9 in detail. In the existing literature, two categories of environmental variables are usually considered: firstly country-specific variables which describe the main macroeconomic conditions and secondly bank-specific variables which describe the structure of the banking industry. Three dummy variables with values of 0 and 1 also have been defined in the analysis which represents the operational style of the bank. Table (14) illustrates descriptions of these environmental variables.

Table 5-4) Description of the contextual variables used in the analysis

Contextual variables	Description	Value	Expected relationship	Data Source
Bank-specific Characteristics				
Liquidity (LATD)	Liquid asset to deposit	Ratio	negative	BankScope
Capitalization (ETA)	Equity to total assets	Ratio	positive/negative	BankScope
Credit Risk (LLRTL)	Loan loss reserves to total loans	Ratio	negative	BankScope
Size (LNTA)	Natural Logarithm total asset	Logarithm	positive	BankScope
Macroeconomics variables				
Inflation	average consumer prices	Percentage	positive/negative	World Bank
GDP Growth	Annual Per cent change of Gross domestic product, constant prices	Percentage	positive	World Bank
Concentration	Herfindahl Index (in terms of bank assets)	Hefindenhal Index	negative	BankScope
Dummy				
Operational Style	Three dummy variables, dummy 1 which takes value of one if the bank operates under commercial style and zero otherwise. The same for the other two dummy variables	Dummy 1,2,3		
Data been collected	*from BankScope*			

The bank specific variables included in the regressions are ETA (Equity to Total Asset), LATD (Liquid Asset to Deposit), LLRTL (Loan Loss Reserve to total loans), and LNTA (ln of total assets).These variables are defined as follow:

1. ***Capitalization (ETA):*** This variable is capital ratio which is measured as a ratio of equity to total assets.

2. ***Liquidity (LATD):*** Another important variable is liquidity which is calculated as ratio of liquid assets to total deposits and borrowing.

3. ***Credit Risk (LLRTL):*** ratio of loan loss reserves to total loans has been implied to measure the credit risk of the banking system.

4. ***Size:*** the natural logarithm of total assets has been used as a proxy of bank size.

Country-specific variables used in this research are inflation, GDP growth and concentration which are defined as follows:

1. ***GDP Growth:*** an important factor that may also impact macro-economic conditions and the financial system is the GDP growth rate which is measured by annual percentage change of Gross Domestic Product and constant prices

2. ***Inflation:*** annual percentage of change in the Consumer Price Index (CPI) has been used as a measure to account for the impact of inflation on efficiency.

3. ***Concentration:*** is termed as a share ratio of total assets of three largest banks to those of all banks which is called the Herfidenhal Index asset base.

Table (5.5) summarizes the values of environmental variables in the eight oil exporting Middle Eastern countries. As table (5.5) shows, Iraq followed by Iran, have the largest proportion of inflation change over period 2000-2011 while Bahrain experienced the smallest proportion. Although the mean of percentage change of the consumer price index for Iraq over this period was 18.51 this country experienced at least one year of negative growth in its inflation rate. Bahrain, Oman, Qatar and Saudi Arabia experienced negative growth. Average GDP growth for Qatar over the period is 13.05 while Saudi Arabia, followed by Oman, experienced the lowest growth of GDP. As it is shown in the Table (5.5) Iraq, Kuwait and the United Arab Emirates have negative growth of GDP in at least one year during 2000-2011.

Table 5-5) Summary on contextual variables for MEOE countries over the period 2000-2011

		Inflation Change	GDP Growth	Herfidenhal Index	LATD	ETA	LLRTL	Size
Bahrain	Mean	1.44	5.60	0.17	76.91	27.67	9.94	14.40
	Median	2.01	5.44	0.14	44.04	21.09	4.24	14.53
	St.Dev.	1.68	1.84	0.08	108.02	23.29	16.16	1.63
	Min	-1.18	2.10	0.09	0.00	6.34	0.00	10.66
	Max	3.53	8.38	0.31	578.41	99.78	100.00	17.30
Iran	Mean	15.13	5.07	0.22	35.95	10.01	2.95	16.34
	Median	14.07	5.52	0.17	25.84	6.74	2.49	16.78
	St.Dev.	4.64	2.26	0.14	35.77	12.89	2.23	1.33
	Min	10.40	0.58	0.14	2.44	2.55	0.07	10.76
	Max	25.40	8.16	0.67	272.57	87.01	7.79	17.87
Iraq	Mean	18.51	4.46	0.52	107.01	29.70	10.79	12.57
	Median	5.60	2.97	0.57	94.42	26.91	0.00	12.43
	St.Dev.	21.61	3.83	0.19	68.75	16.44	25.12	1.41
	Min	-2.19	-0.72	0.00	35.46	8.01	0.00	10.09
	Max	53.25	9.51	0.84	528.82	82.21	92.47	16.52
Kuwait	Mean	3.51	5.64	0.11	39.89	13.24	5.85	15.92
	Median	3.52	5.57	0.11	38.71	12.27	5.25	15.94
	St.Dev.	2.76	6.22	0.02	20.18	4.01	2.72	0.78
	Min	0.80	-7.82	0.09	4.34	0.77	1.87	13.93
	Max	10.62	17.34	0.14	134.20	32.54	14.53	17.69
Oman	Mean	2.75	4.98	0.18	28.74	13.06	6.19	14.79
	Median	2.55	4.80	0.18	28.50	13.52	5.05	14.72
	St.Dev.	3.80	3.09	0.01	9.14	2.18	4.24	0.74
	Min	-1.20	0.34	0.16	15.73	7.45	1.45	13.47
	Max	12.56	13.12	0.20	51.18	20.09	24.04	16.75
Qatar	Mean	4.71	13.05	0.24	55.85	16.00	4.37	15.23
	Median	2.09	13.04	0.23	33.56	14.17	2.21	15.39
	St.Dev.	6.45	6.60	0.04	95.04	6.69	6.92	1.20
	Min	-4.87	3.20	0.18	6.86	7.01	0.00	12.57
	Max	15.05	26.17	0.30	685.34	43.26	38.59	18.23
Saudi Arabia	Mean	2.60	3.81	0.22	40.03	17.43	4.17	16.28
	Median	1.46	4.55	0.22	22.86	13.34	3.38	16.37
	St.Dev.	3.31	2.61	0.06	83.44	13.68	4.28	1.00
	Min	-1.13	0.10	0.15	2.46	4.07	0.00	14.13
	Max	9.87	7.66	0.32	943.96	98.93	28.79	18.20
Unied Arab Emirates	Mean	4.78	5.92	0.11	32.59	18.42	5.06	15.00
	Median	3.02	5.94	0.11	29.36	16.67	3.40	14.94
	St.Dev.	4.06	5.90	0.01	17.46	8.04	5.23	1.43
	Min	0.88	-4.80	0.09	0.86	6.34	0.00	11.05
	Max	12.25	16.39	0.14	102.73	61.33	26.97	18.17

Source: base on author calculation using 899 observations

Examination of the Herfidenhal index demonstrates that Iraq has the most concentrated banking system, while UAE and Kuwait have the less concentrated banking systems. The Herfidenhal Index for Iraq shows that the asset share of three largest banks in Iraq is 52 percent of the assets of the whole of the banking system in the country. Bank-specific characteristics of Middle East oil exporting countries have been analyzed further by drawing boxplots. Figures (5.11) to (5.16) illustrate the boxplot of bank-specific variables.

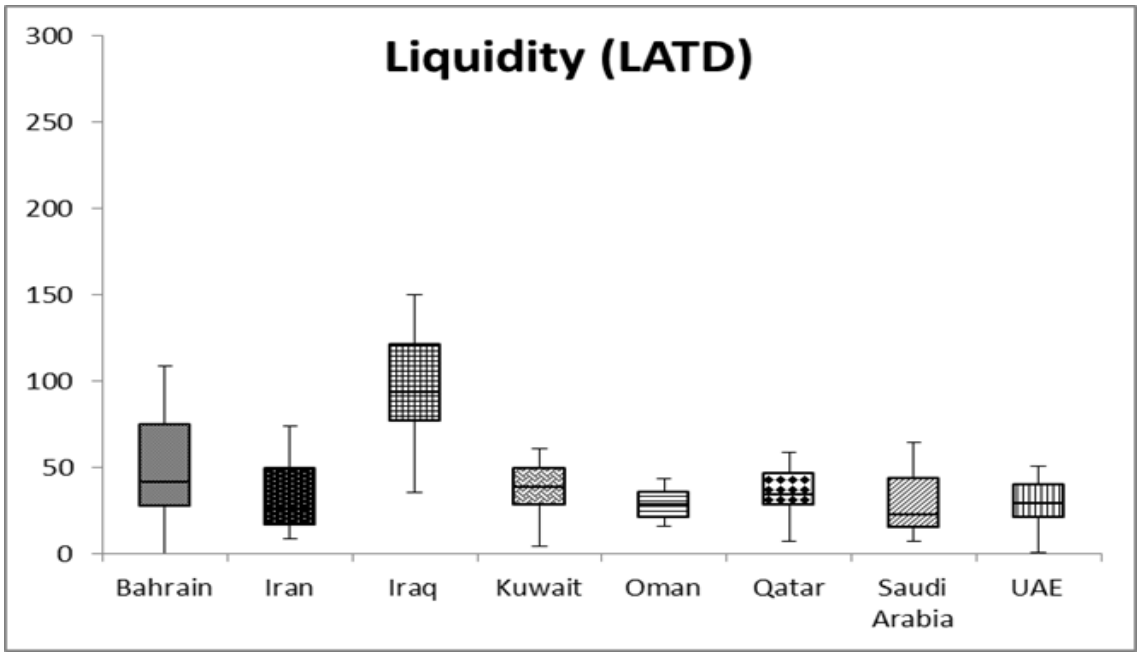


Figure 5-11) Liquidity boxplot for banking industries in MEOE countries

Figure (5.11) shows that the median value of liquidity for banks operating in Iraq is higher than for banks operating in other countries and less liquid banks operate in Bahrain, Kuwait and UAE. The banking systems of Qatar, Kuwait, United Arab Emirates and Oman have approximately the same distribution of liquidity. Moreover as it can be seen, Bahrain and Iraq have an internal quartile of liquidity variable which is larger than for other banking systems'.

Capitalization of banks has been presented by ratio of equity to total assets in this research. Figure (5.12) illustrates that the internal quartile of this variable for the banking industries of Iran, Kuwait, Oman and Saudi Arabia is very small. The most capitalized banks in the sample of observation can be seen in the Bahraini and Saudi Arabian banking industries.

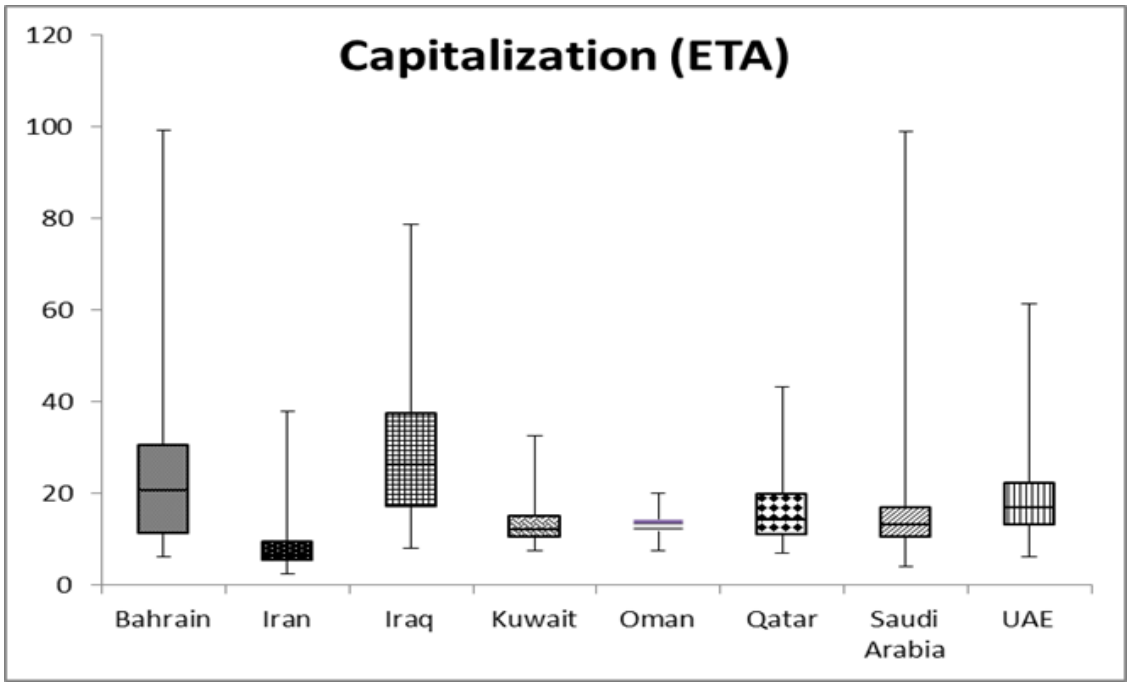


Figure 5-12) Capitalization boxplot for banking industries in MEOE countries

According to Figure (5.13) the distribution of credit risk in the Kuwaiti banking system is more normal than for other banking systems. While the highest value of credit risk observed in the sample belongs to the Bahraini banking industry, the lowest value goes for the Iraqi banking industry. The median value of this variable for banks operating in Saudi Arabia, United Arab Emirates and Bahrain is nearly the same.

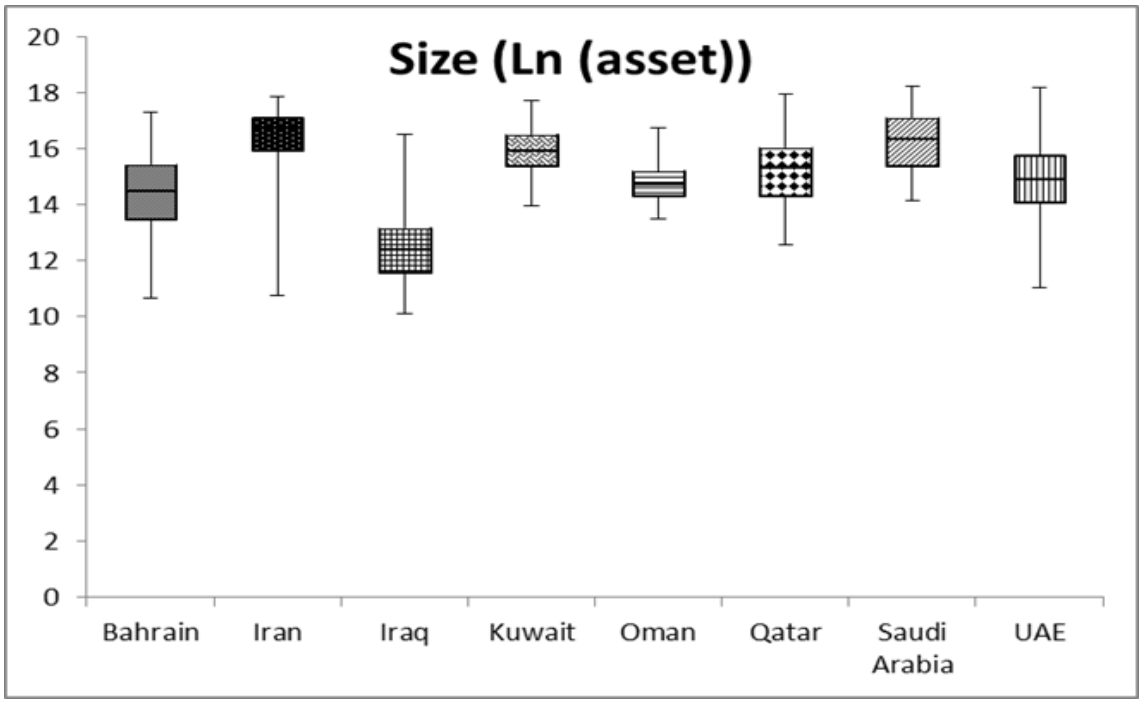


Figure 5-13) Size boxplot for banking industries in MEOE countries

Boxplots of the size variable show that the sizes of all banks in this research been contained in the range 10 to 18. The internal quartile for Iran is situated between 16 and 18 while the internal quartile for Iraq is contained between 11 and 13 which demonstrates that the Iranian banking system has the largest banks overall while the Iraqi banking industry has the smallest ones.

The second group of contextual variables are country-specific variables. Figures (5.14) to (5.16) illustrate the average of these variables over the 2000-2011 periods for each country.

Figure (5.14) shows that Iraq, followed by Iran, has the largest inflation mean while Bahrain experienced the smallest inflation mean during the sample period. It can also be seen that the average of yearly percentage change of the consumer price index for Iraq is nearly 8 times more than for Bahrain. The average of the inflation variable for Kuwait, Qatar and United Arab Emirates are approximately the same.

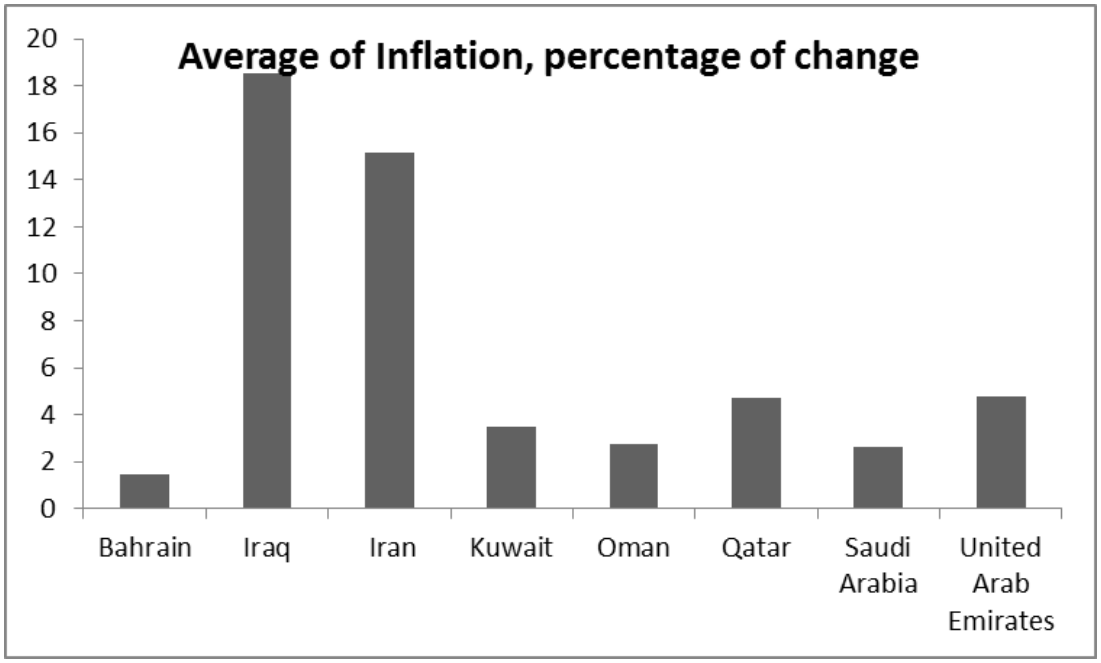


Figure 5-14) Mean of Inflation variable of banking industry of MEOE countries

Figure (5.15) illustrates that among all MEOE countries Qatar has the highest average of GDP growth rate while this rate for Iraq is the smallest. As one can see, the average of this variable for Bahrain, Kuwait and Saudi Arabia in approximately the same over the 2000-2011 periods.

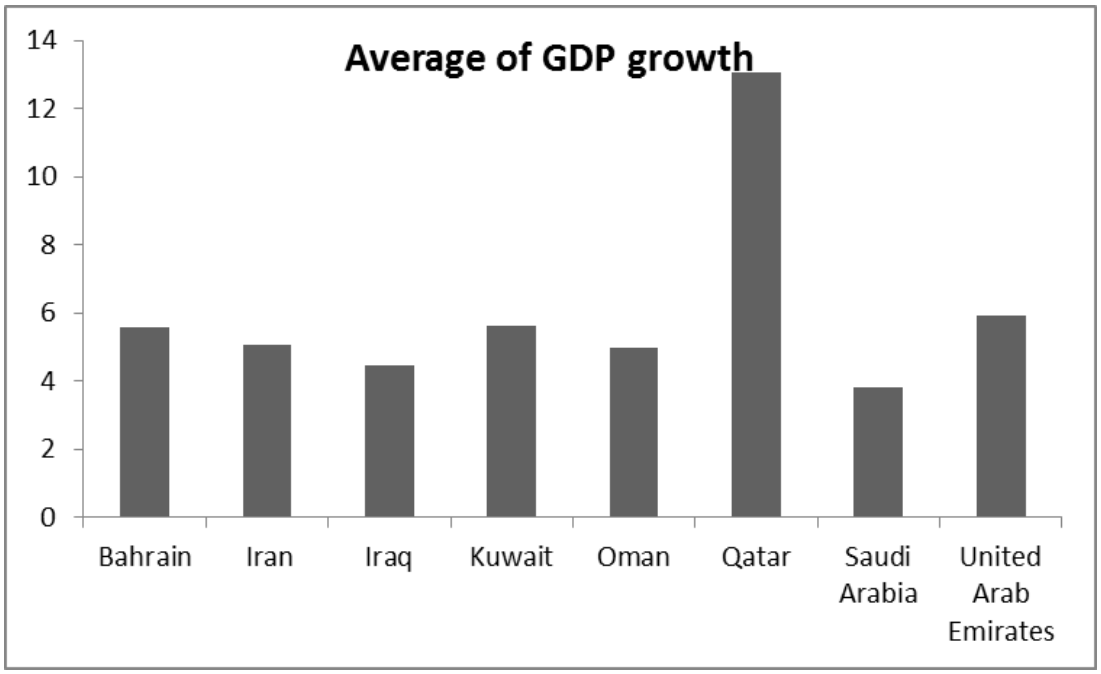


Figure 5-15) Mean of GDP Growth variable of banking industry of MEOE countries

As is shown in Figure (5.16), Iraq has the most concentrated bank market assets compared to the other MEOE countries while Kuwait and United Arab Emirates have the least concentrated. Figure (5.16) also illustrates that Qatar, Saudi Arabia and Iran have almost the same bank market asset concentration.

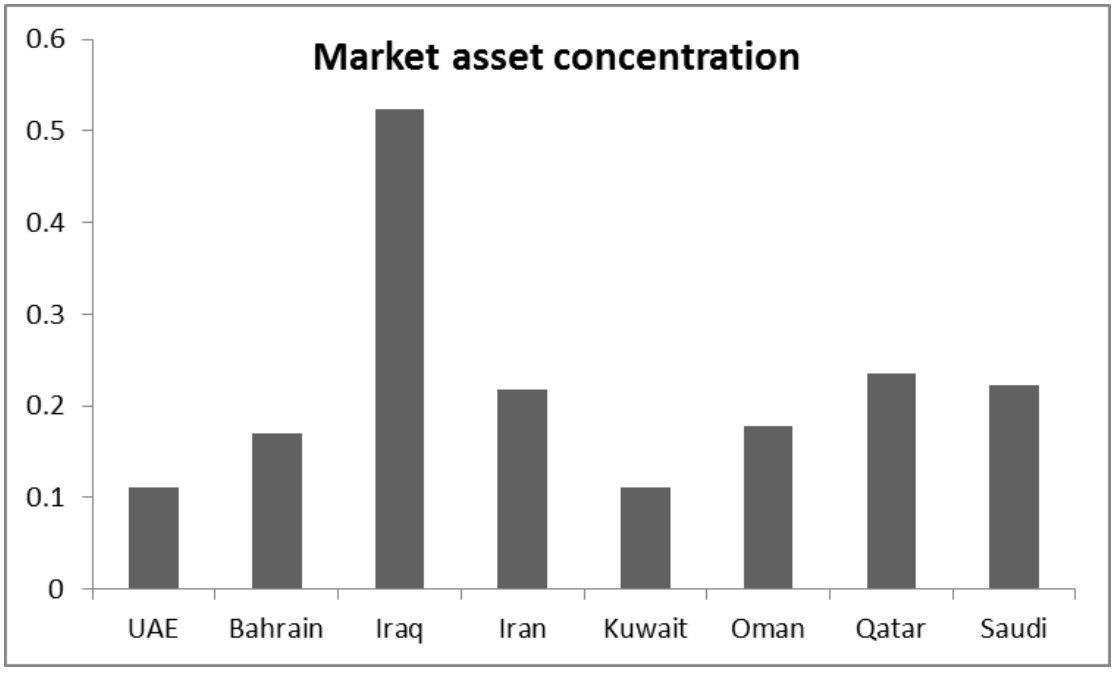


Figure 5-16) Mean of market asset concentration variable of banking industry of MEOE countries

After presenting a descriptive analysis of input and out variables which leads to obtaining the dependent variable (efficiency), descriptive analysis, bank-specific and

country-specific variables, the main variable of the research and descriptive analysis regarding this variable will be discussed in the followings section.

5.4 Main research variable (oil price movement)

Two groups of variables have been used in this research to analyse the impact of oil price changes on the performance of banks. The first category is oil price changes which include real oil price increase, positive and negative oil price shocks and positive and negative oil price volatility. The second group consists of only one variable, oil revenue which been proxy because of the dependency of a country on oil income.

The oil price is defined as the ratio of the simple average of three crude oil price measures- UK Brent (EUCRBREN), Dubai (PGCRDUBAI) and West Texas Intermediate (USCRWTS) in the US dollar per barrel to the US GDP deflator. In the context of the methodology followed here, the definition of real price represents a common shock to all countries. The dependent variable and environmental variables used in this research are yearly based data, thus yearly oil price data are obtained from the Bloomberg database. Table (5.6) demonstrates three crude yearly oil price measures- UK Brent (EUCRBREN), Dubai (PGCRDUBAI) and West Texas Intermediate (USCRWTS) in the US dollar per barrel and simple average of them and US GDP Deflator.

Table 5-6) Three crude yearly oil price and oil price measure

Date	PGCRDUBAI Index	EUCRBREN Index	USCRWTSM Index	Average of 3 Indices	US GDP DEF	Oil Price measure
29/12/1999	23.280	27.540	24.080	24.967	86.843	0.287
29/12/2000	20.070	23.430	24.100	22.533	88.722	0.254
29/12/2001	18.280	16.220	18.290	17.597	90.727	0.194
29/12/2002	26.240	28.960	30.150	28.450	92.196	0.309
29/12/2003	27.900	30.480	30.270	29.550	94.135	0.314
29/12/2004	33.110	40.240	38.700	37.350	96.786	0.386
29/12/2005	53.190	58.870	55.940	56.000	100.000	0.560
29/12/2006	56.710	60.280	56.620	57.870	103.231	0.561
29/12/2007	89.060	94.500	91.870	91.810	106.227	0.864
29/12/2008	37.020	41.710	43.400	40.710	108.583	0.375
29/12/2009	78.290	77.500	77.360	77.717	109.529	0.710
29/12/2010	88.540	95.500	88.680	90.907	110.993	0.819
29/12/2011	104.840	108.680	97.480	103.667	113.359	0.914

Source: Bloomberg 2013

Figure (5.17) illustrates three crude yearly oil price measures- UK Brent (EUCRBREN), Dubai (PGCRDUBAI) and West Texas Intermediate (USCRWTS) in the US dollar per barrel over period 1999-2012.

As discussed in section 3.2.1, the details of Figure (5.17) and Table (5.6) illustrate that in 2001 there was a decrease in the price of oil. In 2002 and 2003 the oil production of Venezuela, and later Iraq, decreased thus the oil price experienced an increase. Although in 2004, OPEC increased its production, on the other hand, global economic growth was impressive and there was a high demand for oil. Thus, as it is shown in figure 4.1 there was a smooth increase in the price of oil during 2001-2006. A decrease in Saudi Arabian production by 850,000 barrels per day from 2005 alongside China's increase in consumption of oil by 840,000 barrels a day during 2005 to 2007 resulted in a sharp increase in the price of oil in 2007. Speculation in the crude oil futures market was exceptionally strong. While on 3rd July, 2008, trading on NYMEX closed at a record USD145.29, for the rest of the year because of falling petroleum demand the price fell throughout the remainder of the year to below USD40 in December. In 2009 OPEC cut production by 4.2 million barrels per day and the oil price rose steadily. At the beginning of 2011, as a consequence of the loss of Libyan oil exports, prices jumped again.

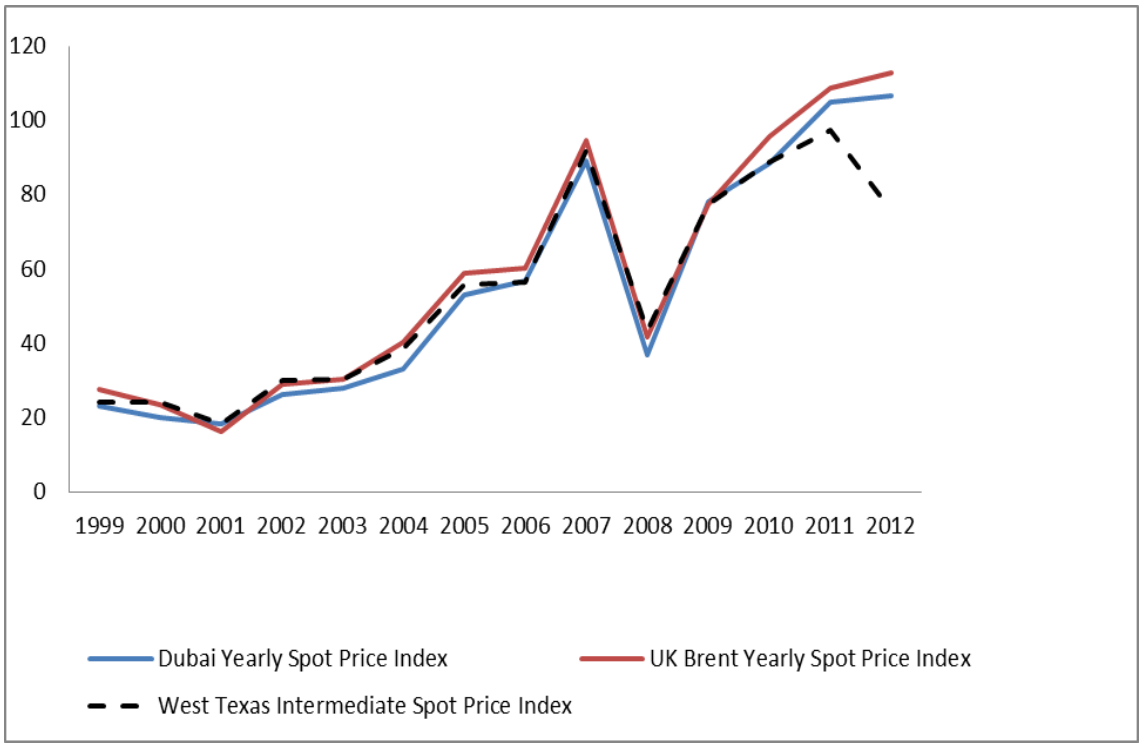


Figure 5-17) Crude yearly oil price 3 different indices at the end of the year over period 1999-2012 (USD)

As explained in section 4.2 main research variable which is oil price movement has been consisted of two different categories the first is oil revenue and the second is oil price changes. In the following sections the descriptive analysis of these two categories will be explored.

Oil revenue

Table (5.7) shows the value of this variable for eight Middle Eastern oil exporting countries during the period 2000-2012. As it is illustrated in this table, the data for Iraq was not available for the years before 2005. The Descriptive Statistics for this variable for countries in the sample over the period of research has been provided in Table (5.8).

Table 5-7) Oil revenue values for MEOX countries over 2000-2011

	Bahrain	Iran	Iraq	Kuwait	Oman	Qatar	Saudi Arabia	UAE
2000	0.59	0.25	n/a	0.48	0.48	0.60	0.37	0.26
2001	0.46	0.17	n/a	0.43	0.46	0.56	0.33	0.23
2002	0.47	0.20	n/a	0.37	0.43	0.51	0.34	0.21
2003	0.48	0.20	n/a	0.41	0.43	0.52	0.38	0.23
2004	0.49	0.22	n/a	0.45	0.44	0.51	0.44	0.26
2005	0.58	0.29	0.72	0.53	0.51	0.53	0.51	0.30
2006	0.58	0.28	0.65	0.52	0.47	0.52	0.53	0.32
2007	0.58	0.29	0.65	0.52	0.45	0.49	0.53	0.29
2008	0.62	0.25	0.71	0.56	0.47	0.56	0.59	0.33
2009	0.46	0.19	0.59	0.43	0.39	0.43	0.43	0.25
2010	0.49	0.20	0.61	0.45	0.43	0.47	0.46	0.26
2011	0.57	0.23	0.65	0.51	0.50	0.55	0.56	0.30

Source: IMF

Table 5-8) Descriptive analysis of oil revenue variable

	Bahrain	Iran	Iraq	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Mean	0.531	0.230	0.653	0.470	0.455	0.522	0.457	0.270
Median	0.533	0.226	0.652	0.466	0.452	0.516	0.453	0.261
St. Dev.	0.061	0.040	0.047	0.057	0.035	0.045	0.089	0.037
Minimum	0.462	0.168	0.587	0.369	0.386	0.431	0.326	0.208
Maximum	0.623	0.286	0.717	0.555	0.509	0.599	0.590	0.327

Author's estimations

As it is illustrated in Tables (5.7) and (5.8), Iraq has the highest average of OED which means 65 per cent of GDP is obtained from oil export revenue. This ratio for Bahrain and Qatar is 53 per cent and 52 per cent respectively. However, Iran and UAE are countries which experienced the lowest dependency on oil export revenue. Table (5.7)

shows more precisely that for all countries in the sample, except Iran in 2008, there was an increase in the value of the oil export dependency variable which is consistent with an historic increase in the price of oil in the first half of that year. Although oil price reached its highest value in July 2008, however the decreasing trend in price of oil in the remaining of year 2008 results in small difference in level of OED of these countries in 2007 and 2008. This difference is more considerable between years 2008 and 2009.

Oil price changes

Table (5.9) shows positive and negative values of oil price shock, positive and negative values of oil price volatility and NET oil price increase value for the period 2000-2011. The descriptive analysis of values of these variables has been illustrated in Table (5.10).

Table 5-9) Oil price changes variables over 2000-2011

year	Δln(OP)	ROILPt+	ROILPt-	OILVOL+	OILVOL-
2000	-0.091	0.000	-0.091	0.000	-0.257
2001	-0.211	0.000	-0.211	0.000	-0.578
2002	0.417	0.417	0.000	1.131	0.000
2003	0.026	0.026	0.000	0.070	0.000
2004	0.206	0.206	0.000	0.524	0.000
2005	0.372	0.372	0.000	0.894	0.000
2006	0.001	0.001	0.000	0.002	0.000
2007	0.433	0.433	0.000	0.930	0.000
2008	-0.835	0.000	-0.835	0.000	-1.748
2009	0.638	0.638	0.000	2.435	0.000
2010	0.143	0.143	0.000	1.546	0.000
2011	0.110	0.110	0.000	1.238	0.000

Table (5.9) illustrates the value of three oil price change variables. Values of real oil price proxy (ΔLn(OP)) show a decrease in price of oil over years 2000, 2001 and 2008. Asymmetric specification proxies also represent a negative change in the price of oil in the same years. According to Scale Specifications which demonstrate the volatility in the price of oil in the years 2000, 2001 and 2008 show negative changes. Moreover, 2009 and 2010 experienced the biggest positive changes in the price of oil during 2000-2011. Table (5.10) demonstrates the description of oil price proxies.

Table 5-10) Descriptive Statistics for oil price changes proxies, 2000-2011

Oil Price Proxy	Mean	Median	Maximum	Minimum	Std. Dev.
Δln(OP)	0.101	0.127	0.638	-0.835	0.383
ROILPt+	0.196	0.127	0.638	0.000	0.218
ROILPt-	-0.095	0.000	0.000	-0.835	0.242
OILVOL+	0.731	0.709	2.435	0.000	0.778
OILVOL-	-0.215	0.000	0.000	-1.748	0.513

Table (5.10) illustrates that while the real oil price increase has the smallest standard variation; oil price volatility has the largest variation from average for oil price changes over the period of research.

5.5 Chapter Summary

In order to investigate the impact of oil price changes on bank performance in oil exporting countries, Middle East banking industries were targeted. After applying appropriate criteria, 899 banks in eight countries were chosen. Since efficiency has been used in this research as a measure of banks' performance and as a dependent variable, input and output variables resulting in an efficiency score were discussed in detail. The input variables are defined as deposit, fixed asset and equity while the output variables are total loan and net income.

To answer the main question of this research which is how oil price impacts on the efficiency of banks, the oil price variable has been explained under two headings: oil revenue and oil price changes. With the main variable, two groups of contextual variables were also used: bank-specific variables and country-specific variables. Bank-specific variables consist of liquidity, capitalization, credit risk and size while country-specific variables are growth of GDP, inflation and concentration of banks-assets. These variables were discussed and analysed in this chapter.

Chapter 6 FINDINGS AND DISCUSSION

The previous two chapters detailed the methodology and data which have been used to answer the research questions. This chapter consists of three sections in which each section has its own research questions and the questions will be answered separately in each section. The first section will answer the question of measuring performance of banks operating in MEOE countries. Second and third sections will answer the questions ‘’whether oil revenue of a country impacts performance of banks operating in MEOE country’’ and ‘’whether oil price changes impact performance of bank operating in MEOE countries’’ respectively.

In the first section of this chapter, four different efficiency measures which proxy the performance of banks operating in MEOE countries over the period 2000-2001 will be discussed. The performance of banks operating under different operational styles will be assessed and the best performing banks will be recognized. In addition each country’s banking sector performance will be analysed.

In the second section, the impact of oil revenue on the performance of banks will be investigated. The oil export dependency of a country has been used to proxy oil revenue. This section will answer the question, “does the oil revenue of an oil exporting country impacts performance of its banks or not, and if it does, is this impact a direct one, or an indirect one?”. Another question that will be discussed is, “in case oil revenue is related to the performance of banks, which banks have been affected mostly: commercial banks, Islamic banks or investment banks?”

Two groups of oil price movement proxies which were introduced in chapter four and five will be used in section three of this chapter in order to investigate the impact of oil price movement on the performance of banks in MEOE countries. As with section two, the study answers the question, “do oil price movement impact the performance of banks, or not, and if so, is this impact a direct impact or an indirect impact through macroeconomic channels?” The next question to be answered is:’’ banks operating under which operational style have been most affected by oil price movement over period 2000-2011 in MEOE countries’’.

6.1 Bank efficiency in MEOE banking industries

In the first section of chapter six, efficiency scores of MEOE banking sectors are empirically analysed for the years 2000 to 2011 using the methodology explained in chapter two. This section is set out as follows: section 6.1.1 discusses the results of efficiency scores, which have been obtained by applying non-parametric DEA. The following two sections (6.1.2 and 6.1.3) will analyse the efficiency scores across the years of research, the banks' operational style and the country. Section 6.1.4 reports the most efficient DMUs in the MEOE banking industry where the operations of other DMUs have been compared to these banks. The relative performance of banks in each of the oil exporting countries will be individually investigated in section 6.1.5. Section 6.1.6 summarizes the findings of the first section of chapter six and investigates which of these efficiency scores are most suitable to be the response variable for the analysis of the impact of oil price movement on the performance of banks in MEOE countries.

Consequently, in calculating the efficiency for each bank in a given year, a 'common frontier' has been built by pooling the observations from 11 years instead of a 'year specific' best-practice frontier. By pooling the data across years, it has been assumed that all banks operate in the same environment during the study period. However, one may argue that since the banks operate in different years, their performances could be affected by the macroeconomic indicators existing in those years. The impact of these environmental variables on efficiency have been analysed in the second stage of research. By creating a pooled frontier, it is possible to measure and compare each of the 899 observations for the 2001-2011 annual periods relative to the same frontier by treating each bank in each period as a different entity. Furthermore, a 'common frontier' approach can provide a trend in the efficiency of a bank, which would not be available if a 'year specific frontier' approach had been applied. Therefore, the 'common frontier' approach provides variations in the efficiency of banks over both time and space. This comparison across time and countries is applied on the same principle as the use of global frontier in Portela and Thanassoulis (2010).

Inter correlations of the inputs and outputs of the DEA model have been measured in order to certify that inputs and outputs are isotonic. According to Avkiran (2006) a high correlation is preferred. Table (6.1) shows correlation coefficients between an input and an output pair.

Table 6-1) Correlation coefficient between inputs and outputs

	Deposit	Fixed Asset	Equity	Net Income	Loans
Deposit	1.000				
Fixed Asset	0.630	1.000			
Equity	0.877	0.573	1.000		
Net Income	0.724	0.550	0.796	1.000	
Loans	0.959	0.615	0.876	0.706	1.000

Table (6.1) shows that the correlation coefficients between an input and an output pair are more than 0.55 for all pairs. These figures cannot be considered as a low correlation therefore it can be claimed that the variables pass the isotonicity test.

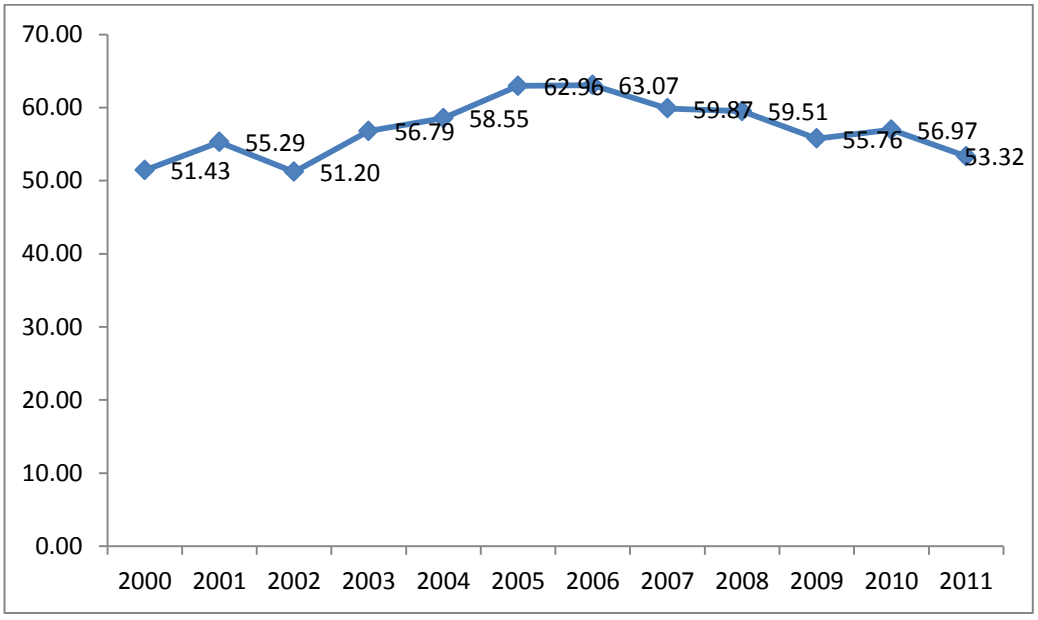


Figure 6-1) Mean Efficiency scores of MEOE banks over period of study

The efficiency score shows the ability level of a bank to produce a given set of outputs with minimal inputs compared to other banks. To see how efficiency scores of MEOE banks change over the period of the study, Figure (6.1) shows a time series of the efficiency score, on an average, for each year during the period 2000-2011.

Figure 19 shows how the average efficiency score fluctuated between 51% and 56.5% during 2000-2003. After this period there was an improvement and it climbed to 58.55% in 2004. In the next year it climbed to 62.96% and over the subsequent year (2006) it experienced a steady increase to 63.07%, which is the highest figure it reached during 2000-2011. In 2007, the trend shows a fall and the average efficiency score dropped to 59.87% and in 2008 it shows a gradual decrease to 59.51% and then it

plummeted to a low of 55.76% in 2009. In the following year the trend experienced a smooth increase and in 2011 again it dropped to 53.32%. Therefore efficiency score experienced the lowest and highest figure, by average, in 2002 and 2006 respectively. The average efficiency score experienced a sharp fall in 2002 and a considerable increase for the next two years (58.55%). This can be explained by the fact of the Persian Gulf crisis and the injection of more money into the financial market (banks) by the government of countries such as United Arab Emirates, Kuwait and Saudi Arabia (Anouzs, 2009).

To have a better understanding of the bank pure technical efficiency of MEOE countries Table (6.2) summarizes the results for each country in each year, on average

Table 6-2) Efficiency of MEOE banking sectors over 2000-2011

	Bahrain (N=21)	Iran (N=8)	Iraq (N=9)	Kuwait (N=9)	Oman (N=6)	Qatar (N=9)	Saudi Arabia (N=13)	United Arab Emirates (N=23)
2000	42.48	87.98	-	49.45	62.37	60.92	46.38	46.99
2001	36.12	78.67	-	52.55	62.24	63.80	46.41	47.22
2002	32.03	55.52	-	55.12	62.08	58.60	48.87	46.21
2003	44.51	85.73	-	57.54	57.56	56.24	49.93	46.02
2004	42.85	81.59	-	61.68	59.76	52.92	58.76	52.29
2005	58.00	81.29	54.00	56.18	58.59	66.19	68.21	61.20
2006	59.89	67.24	51.52	57.90	65.16	67.00	75.71	60.15
2007	54.80	64.97	42.45	63.73	60.51	66.42	67.12	58.99
2008	45.63	68.21	34.94	65.88	65.80	67.38	65.37	62.90
2009	33.65	71.55	30.23	61.83	64.57	61.33	61.32	61.59
2010	38.91	78.11	32.08	59.40	61.31	64.18	60.59	61.23
2011	38.85	-	27.33	59.76	65.37	59.94	65.06	56.94
Efficiency Score average per country	43.98	73.29	38.93	58.42	62.11	62.08	59.48	55.14

Table (6.2) shows that the Iranian banks have the highest overall efficiency score. Between the years 2000 and 2011, the Iranian banks experienced the highest overall efficiency in 2000 when the overall efficiency score was 85.73%. The next two countries which have better performance on average compared to other MEOE countries during the research period are Oman and Qatar with average efficiency of

62.11% and 62.08% respectively. Iraq has the lowest average efficiency score and Iraqi banks in 2011 have the lowest average performance compared to all banks operating in these countries during 2000-2011. The average efficiency score for half of the banks reached its highest in 2006 and for Iran in 2003 which was before the impact of financial sanctions on this country. For Qatar and United Arab Emirates the highest level was experienced in 2008 and for Iraq in 2005 the first year in which data was available for this country.

The overall average of the efficiency score was 56.67% for 899 observations which suggests that, by adopting best practices, MEOE banks can, on average, with the same level of inputs increase their outputs by 43.33%. However, the potential increment in output from adopting best practices varies from bank to bank. Moreover MEOE banks have the possibility of producing 1.76 times ($\frac{1}{0.567}$) as much outputs from the same level of inputs.

The result of efficiency measures presented in this research is lower than what was reported in earlier studies. The average efficiency measure by Anous (2010) was more than 80% for all six GCC banking industries (Bahrain, UAE, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates) in the period 1998-2007. Said (2013) reported an average PTE of nearly 75.9% for Islamic MENA banks (32 banks) in the period 2006-2009. Ftiti (2013) measured efficiency of GCC (Bahrain, UAE, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates) over the period of 2005-2009 at 84%. This can be attributed to a discrepancy in the larger sample of banks analysed in this research. This research sample consists of 98 banks which contain 899 observations for a period of 12 years. This period covers two crises, first 2003 Persian Gulf Crisis and second 2008 oil shock crisis. Moreover, the results of the efficiency score are not comparable with other studies because the frontier is not the same. For instance Anous (2010) evaluated the average of efficiency of GCC banks in 2006 and 2007 81.2% and 79.3% respectively while Said (2013) measured efficiency of GCC banks in 2006 and 2007 88% and 82.8% respectively. The first author used a data sample from over ten years while the second one used the data over only four years. This research includes Iranian banks and Iraqi banks and Iranian banks have large fixed asset values which impact their efficiency measurements. The efficiency of the other banks are measured in comparison to best practice banks.

6.1.1 Comparison of Different Efficiency Types in MEOE Banking Sector

Table (6.6) illustrates the descriptive analysis of efficiency scores of the MEOE banking sectors over 2000-2011.

Table 6-3) Descriptive Analysis of efficiency scores of MEOE banking sectors over 2000-2011

Efficiency Measures	Minimum	Maximum	Mean	Std. Dev.
Panel A: MEOE banks 2000 (N=52)				
Pure Technical Efficiency	15.77	100	52.83	22.53
Panel B: MEOE banks 2001(N=54)				
Pure Technical Efficiency	6.93	100	52.05	23.48
Panel C: MEOE banks 2002(N=56)				
Pure Technical Efficiency	5.4	100	51.5	20.08
Panel D: MEOE banks 2003(N=60)				
Pure Technical Efficiency	3.9	100	54	20.41
Panel E: MEOE banks 2004(N=63)				
Pure Technical Efficiency	13.24	100	56.33	20.29
Panel F: MEOE banks 2005(N=77)				
Pure Technical Efficiency	15.15	100	61.15	23.36
Panel G: MEOE banks 2006(N=83)				
Pure Technical Efficiency	15.84	100	61.78	23.76
Panel H: MEOE banks 2007(N=96)				
Pure Technical Efficiency	7.03	100	59.87	24.5
Panel I: MEOE banks 2008(N=96)	2.66	100	45.8	22.37
Pure Technical Efficiency	2.7	100	59.6	27.77
Panel J: MEOE banks 2009(N=94)				
Pure Technical Efficiency	2.91	100	55.05	26
Panel K: MEOE banks 2010(N=91)				
Pure Technical Efficiency	3.17	100	56.28	26.83
Panel L: MEOE banks 2011(N=77)				
Pure Technical Efficiency	2.7	100	52.96	25.84

Banks operating in 2005 have the lowest score of overall technical inefficiency on average while banks working in 2011 have the highest score of overall technical inefficiency. The annual average of inefficiency of MEOE banks not only in 2011 but in all the years over the research period is attributed to pure technical inefficiency rather than scale inefficiency. This fact suggests that MEOE banks' efficiency level could be increased by improving pure technical efficiency rather than scale efficiency. A relatively pure technical efficiency level indicates that MEOE banks were faced more

with mis-allocation of inputs and outputs in their banking operations rather than not operating at the fittest scale. Therefore, management strategies should have been re-evaluated in order to make improvements in banking operations. The highest average of SE score (86.61%) in year 2002 suggests that banks operating in that year were operating at the best possible scale compared to their operations in the other years of this research, on average.

6.1.2 Comparison of Efficiencies of Islamic, Commercial and Investment Banks

The Middle East banking sector is the home of Islamic banking. All banking sectors operating in MEOE in this research have at least one Islamic bank except Oman. In this research, banks have been categorized under three different operational styles: commercial banks, Islamic banks and investment banks. Many banking efficiency studies in the literature (Mohammad et al., 2008; Bader et al., 2008; Hassan, 2009; Srairi, 2010) investigate the difference in efficiency between Islamic banks and conventional banks. To the author's best knowledge this study is the first to categorize banks into three different groups and compare their efficiency scores. The reason for the selection of three operational styles, rather than two, is the considerable number of investment banks operating in the Middle East region.

Since all the other studies consider two operational styles of banks (Islamic banks and conventional banks) in different periods of study and different countries with Islamic banks, it is not possible to compare the results of differences between Islamic banks and conventional banks across different studies due to differences in reference sets and frontier.

The time series of the mean of Efficiency score for commercial, Islamic and investment banks have been presented in Figure (6.5). Figure (6.5) illustrates that investment banks have the lowest mean of Efficiency score compared to the other two groups except for 2006 in which Islamic banks' have a lower Efficiency score. This results implies that investment banks operating in the MEOE banking sector are generally less scale and technically efficient than Islamic banks and commercial banks. Moreover, one can observe from Figure (6.5) that the commercial and investment banking sectors reached their highest Efficiency score value in 2006 while Islamic banks experienced the highest Efficiency score in 2000. It is noticeable that the commercial banks' mean of Efficiency score is higher than the Islamic banks' except for the period 2000-2004. In 2003 investment banks had the lowest mean of Efficiency score while this value for Islamic

banks was considerably higher. Efficiency score fluctuates less in the commercial banking sector in comparison to the Islamic and investment banking sectors.

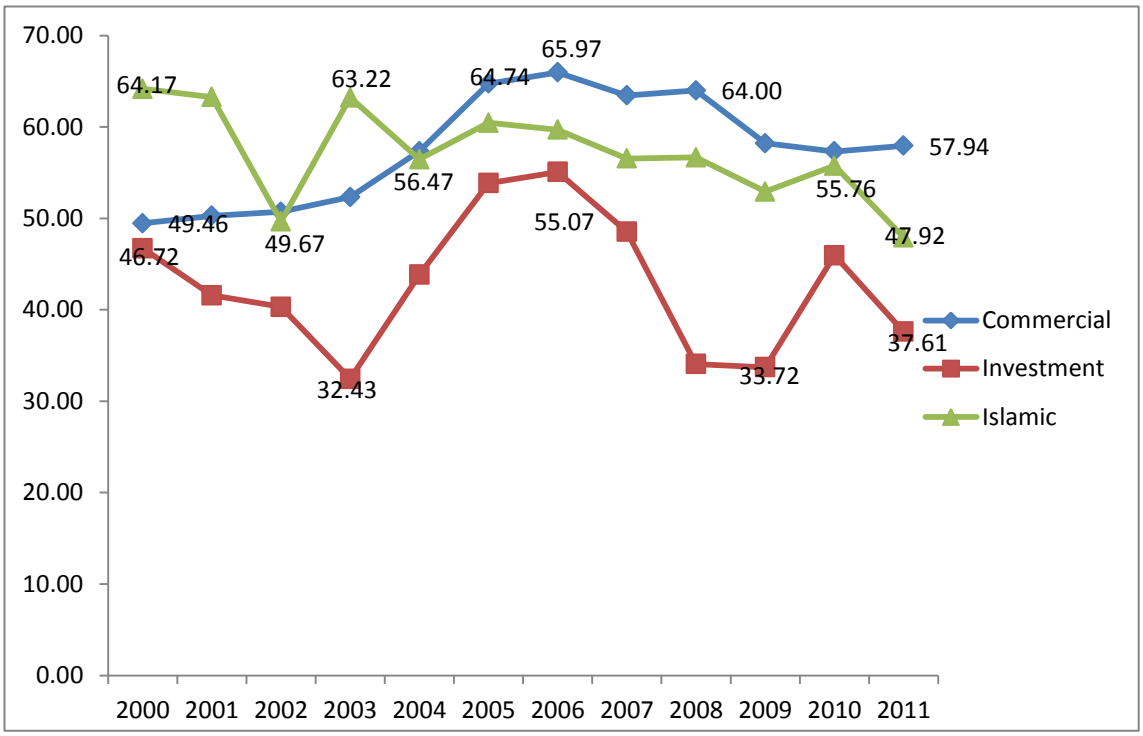


Figure 6-2) Comparison between efficiency of Islamic, Commercial and investment banks of MEOE over 2000-2011

In the period 2004-2006 all three types of banks experienced increasing efficiency scores. The better performance of banks in this period may have been affected by an environmental variable. Reviewing the oil price in this period, it can be suggested that oil price movement as an exogenous factor which influences the economy of oil dependent countries and could affect performance of these banks for the better. Moreover, the decrease in the overall efficiency of banks in the period 2007-2009 could be affected by an overall decrease in the price of oil from 2007 to 2009. This motivates the researcher to investigate if there is such a relationship between changes in the price of oil and the performance of banks in oil exporting countries.

6.1.3 Full Efficient DMUs

In order to fully rank efficient DMUs operating in the MEOE banking sector, the most efficient DMUs have been reported in Table (6.7).

It is worth mentioning that 60% of efficient (27 out of 45) DMUs in the MEOE banking industry are operating an Islamic banking structure. While this proportion for commercial and investment DMUs is 33.3% and 6.7% respectively. This fact may demonstrate that leading banks in MEOE are mostly the banks operating an Islamic

structure. Considering the countries' pure technical efficient DMUs which they are operating in, one third of efficient DMUs operate in United Arab Emirates while the Kuwaiti and Omani banking sectors do not contribute to the reference set of most efficient DMUs. In the other words, no full technical efficient banks are operating in either the Kuwaiti or Omani banking industries.

Table 6-4) Full efficient DUMs under four different efficiency model

	DMU	year	operational style	Country	Efficiency Score
1	Masraf Al Rayan (Q.S.C.)	2010	Islamic	Qatar	100
2	ABC Islamic Bank (E.C.)	2011	Islamic	Bahrain	100
3	ABC Islamic Bank (E.C.)	2008	Islamic	Bahrain	100
4	ABC Islamic Bank (E.C.)	2007	Islamic	Bahrain	100
5	Bank Saderat Iran	2000	Islamic	Iran	100
6	Karafarin Bank	2006	Islamic	Iran	100
7	ABC Islamic Bank (E.C.)	2005	Islamic	Bahrain	100
8	Masraf Al Rayan (Q.S.C.)	2008	Islamic	Qatar	100
9	Trade Bank of Iraq	2007	commercial	Iraq	100
10	Qatar International Islamic Bank	2005	Islamic	Qatar	100
11	Gulf International Bank BSC	2005	commercial	Bahrain	100
12	Bank Maskan	2010	Islamic	Iran	100
13	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2006	Investment	Bahrain	100
14	Bank Saderat Iran	2002	Islamic	Iran	100
15	Masraf Al Rayan (Q.S.C.)	2011	Islamic	Qatar	100
16	Masraf Al Rayan (Q.S.C.)	2007	Islamic	Qatar	100
17	Trade Bank of Iraq	2008	commercial	Iraq	100
18	Bank Sepah	2001	Islamic	Iran	100
19	National Bank of Abu Dhabi	2005	commercial	UAE	100

	DMU	year	operational style	Country	Efficiency Score
20	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2005	Islamic	Saudi Arabia	100
21	Bank Mellat	2003	Islamic	Iran	100
22	Parsian Bank	2004	Islamic	Iran	100
23	Parsian Bank	2005	Islamic	Iran	100
24	Bank Sepah	2000	Islamic	Iran	100
25	Saudi British Bank (The)	2008	commercial	Saudi Arabia	100
26	Emirates Investment Bank PJSC	2000	Investment	UAE	100
27	Emirates NBD PJSC	2006	commercial	UAE	100
28	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2006	Islamic	Saudi Arabia	100
29	Qatar National Bank	2008	Islamic	Qatar	100
30	Abu Dhabi Commercial Bank	2007	commercial	UAE	100
31	Abu Dhabi Commercial Bank	2008	commercial	UAE	100
32	Qatar National Bank	2010	Islamic	Qatar	100
33	Emirates Investment Bank PJSC	2002	Investment	UAE	100
34	Emirates NBD PJSC	2008	commercial	UAE	100
35	Bank Mellat	2010	Islamic	Iran	100
36	Emirates Investment Bank PJSC	2003	Investment	UAE	100
37	Emirates NBD PJSC	2009	commercial	UAE	100
38	Abu Dhabi Commercial Bank	2009	commercial	UAE	100

	DMU	year	operational style	Country	Efficiency Score
39	Abu Dhabi Commercial Bank	2011	commercial	UAE	100
40	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2009	Islamic	Saudi Arabia	100
41	First Gulf Bank	2008	commercial	UAE	100
42	First Gulf Bank	2009	commercial	UAE	100
43	First Gulf Bank	2010	commercial	UAE	100
44	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2011	Islamic	Saudi Arabia	100
45	Gulf International Bank BSC	2000	commercial	Bahrain	100
46	Parsian Bank	2003	Islamic	Iran	75.64
47	Trade Bank of Iraq	2005	commercial	Iraq	66.93

6.1.4 MEOE Banking Industry Efficiency

In the previous section the four different types of efficiency scores in the MEOE banking sector as a whole has been presented and analysed. Comparison between these efficiency types over each year of research period has been investigated also. Different banks operate in the Middle East, commercial banks, Islamic banks and investment banks and comparison of the efficiency values of these banks has been discussed and the most efficient units have been identified. After examining the banking sector in MEOE countries as a whole, each country's banking sector efficiency will be studied individually in this section. Therefore, in this section the efficiency of banks operating in each country has been presented.

6.1.4.1 Bahraini banks' efficiency

Efficiency for Bahraini banks have been shown in Table (6.9). There are six DMUs with an efficiency value of 100 (ABC Islamic Bank 2005, 2007, 2008, 2011; Investment Bank-Bahrain Middle East Banks 2006; Gulf International Bank 2005).

It is interesting to look at the trend of efficiency changes in some of Bahraini banks which have a considerable variation in their efficiency score. Investment Bank-Bahrain Middle East Bank is one of the banks with significant variation. The efficiency score of this bank in 2006 and 2007 is 100% and 82.88 and this suddenly falsl to 5.21% and 7.42% in 2008 and 2009. One later efficiency score reaches 58.92%. In order to make a clear analysis Table (6.8) has been provides and illustrated the values of inputs and outputs of this bank (Table has been taken from Appendix (B)).

Table 6-5) Input and outputs of Investment Bank-Bahrain Middle East Bank over 2005-2011

	Inputs			Outputs	
Year	Deposit	Fixed Asset	Equity	Net Income	Loans
2005	57,900.00	11,100.00	27,200.00	7,800.00	7,700.00
2006	51,300.00	12,800.00	46,400.00	21,100.00	3,200.00
2007	50,300.00	300.00	71,400.00	24,600.00	1,000.00
2008	27,300.00	500.00	43,000.00	-14,300.00	900.00
2009	23,900.00	500.00	23,700.00	-33,500.00	900.00
2010	20,200.00	400.00	25,200.00	6,400.00	900.00
2011	18,000.00	300.00	29,000.00	3,700.00	9,200.00

Table (6.8) illustrates that the negative value of net income in 2008 and 2009 is in addition to a 45% and 40% drop in deposit and equity values in 2008 compare to 2007. Although this bank has a better performance in 2010 and net income value increases

considerably in comparison to 2009 however there is again a fall in value of this output which results in a lower efficiency score in 2011 compared to 2010.

The same trend occurred for Investment Arcapita Bank. Arcapita Bank B.S.C. is one the banks where the efficiency score dropped from 53.60% in 2008 to 5.87% and 6.50% in 2009 and 2010 respectively. On examination of the inputs and output of this bank (Appendix (B)) it is clear that Arcapita Bank experienced loss profit in 2009 and 2010 which results in a sudden decrease in its efficiency level in 2009 and 2010.

Table 6-6) Efficiency scores of banks operating in Bahrain

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**ABC Islamic Bank (E.C.)**	Islamic													
	Efficiency							100	90.42	100	100	77.52	79.93	100	92.55
2	**Albaraka Bankinh Group B.S.C.**														
	Efficiency					39.8	41.04	47.67	47.78	56.49	64.36				49.52
3	**Alubaf Arab International Bank**	Commercial													
	Efficiency									45.5	19.85	18.87	19.82	28.42	26.49
4	**Arab Banking Corporation BSC**	Commercial													
	Efficiency		54.46	54.46	58.68	58.38	74.07	44.72	52.01	68.06	59.85	55.3	49.84	53.06	56.91
5	**Arcapita Bank B.S.C**	**Islamic**													
	Efficiency									69.79	72.04	7.28	8.41	14.89	34.48
6	**Bahrain Islamic Bank B.S.C**	Islamic													
	Efficiency						15.92	21.91	32.19	34.45	35.36	37.23			29.51
7	**BBK B.S.C.**	commercial													
	Efficiency		39.07	36.08	44.56	52.01	53.94	52.47	57.66	57.1	68.45	58.15	57.5	57.48	52.87
8	**Investment Bank-Bahrain Middle East Bank B.S.C.**	Investment													
	Efficiency							83.45	100	89.04	10.21	23.18	96.36	61.98	66.32
9	**BMI Bank BSC**	**Commercial**													
	Pure Technical Efficiency							77.97	91.86	71.73	45.01	38.77	33.83	37.38	56.65
10	**Capivest**	Islamic													
	Pure Technical Efficiency							52.67	17.92	23.59	13.65	3.64	3.57	30.84	20.84
11	**First energy bank**	Islamic													
	Pure Technical Efficiency									7.03	8.05	5.51	8.2	14.7	8.7
12	**Future Bank B.S.C.**	Commercial													

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
	Pure Technical Efficiency								39.24	32.71	36.46	26.57	27.11	23.05	30.86
13	**Gulf Finance House BSC**	Islamic													
	Pure Technical Efficiency									100	87.53	78.83	71.24	74.21	82.36
14	**Gulf International Bank BSC**	Commercial													
	Pure Technical Efficiency		100	88.05	42.32	47.89	64.77	100	87.54	100	98.53	91.25	89.45	79.87	82.47
15	**Investcorp Bank BSC**	Investment													
	Pure Technical Efficiency		25.06	17.43	21.05	25.03	33	37.34	79.23	39.02	36.07	34.36	43.74	21.89	34.44
16	**Investors Bank BSC**	Islamic													
	Pure Technical Efficiency					56.23	50.87	41.24	37.12	14.7	9.09	11.42	16.81	26.18	29.3
17	**Ithmaar Bank B.S.C.**	Investment													
	Pure Technical Efficiency							44.86	53.79	45.51	28.86	28.29	31.22	36.05	38.37
18	**Khaligi Commercial Banks**	**Islamic**													
	Pure Technical Efficiency								42.41	41.32	45.39	22.22	23.75	23.05	33.02
19	**National Bank of Bahrain**	Commercial													
	Pure Technical Efficiency		35.69	34.24	38.04	41.57	45.14	42.09	47.1	51.37	56.54	58.07	48.69	49.18	45.64

6.1.4.2 Iranian banks' efficiency

Table (6.11) shows different efficiency scores obtained for Iranian banks. A brief look at the results demonstrated in the Table (6.11), shows that Bank Sarmayeh has the least overall efficiency score level compared to the other banks. Among banks performing in Iran, which all are Islamic banks, Bank Saderat Iran in 2000, Bank Maskan in 2005 and Bank Saderat Iran in 2002 experienced the highest super efficiency values respectively. Ten Banks have a efficiency value of 100% (Bank Maskan 2010; Bank Mellat 2003; Bank Saderat Iran 2000, 2002, 2005; Bank Sepah 2000, 2001; Parsian Bank 2004, 2005; Karafarin Bank 2006) which constitute nearly 16.5% of all DMUs in Iran. This proportion compared to other countries indicates that a greater proportion of Iranian banks perform more technically efficiently. The results of the efficiency scores of the Parsian Bank shows that after 2004, this bank was less scale efficient than technically efficient and managers of this bank had misallocated resources in order to produce outputs. Bank Maskan in 2010, Bank Saderat Iran in 2000 and 2002, Karafarin Bank 2005 are the only four DMUs with an efficiency value of 100%. The efficiency levels of banks in Iran over the research period show great variation. This variation can be justified by comparing changes in fixed assets, deposits, equity, net income and loans figures of these banks during 2000-2011 which have been provided in Appendix (B). For instance the efficiency of Karafarin Bank drops dramatically from 100% in 2006 to 59.44% in 2005. Table (6.10) illustrates the inputs and outputs of this bank for 2005 and 2006.

Table 6-7) Input and output values of Karafarin Bank in 2005- 2006

	Inputs			Outputs	
Year	**Deposit**	**Fixed Asset**	**Equity**	**Net Income**	**Loans**
2005	200,761.00	54091.00	223841.00	78092.00	1763098.00
2006	2538086.58	66477.72	203761.00	80417.72	1893219.39

It can be observed from Table (6.10) that deposits in 2006 grow to more than 12 times its value in 2005. Fixed assets increase slightly while equity decreases slightly. It can easily be suggested that the considerable increase in the deposit level only results in a significant increase in output levels. However Table (6.10) shows that net income and loans are only 1.03 and 1.07 times more in 2006 in comparison to 2005 respectively. Therefore, it is apparent that Karafarin Bank did not operate as efficiently in 2006 as it did in 2005. Table (6.11) shows the efficiency scores of Iranian banks.

Table 6-8) Efficiency scores of banks operating in Iran

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**Bank Maskan**	Islamic													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	79.42	72.59	74.61	80.4	100	N/A	81.4
2	**Bank Mellat**	Islamic													
	Efficiency		N/A	N/A	65.99	100	58.74	56.75	61.11	68.21	68.64	77.29	100	N/A	72.97
3	**Bank Saderat Iran**	Islamic													
	Efficiency		100	86.35	100	91.01	92.69	100	65.3	69.28	69.32	70.56	91.66	N/A	85.11
4	**Bank Sarmaye**	Islamic													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	33.75	34.43	43.25	53.17	60.21	N/A	44.96
5	**Bank Sepah**	**Islamic**													
	Efficiency		100	100	83.04	76.13	82.6	68.47	48.89	61.81	68.68	63.82	63.48	N/A	74.27
6	**Bank Tejarat**	Islamic													
	Efficiency		63.94	54.7	29.28	85.88	73.9	81.24	67.48	56.84	68.69	62.95	38.61	N/A	62.14
7	**Karafarin Bank**	Islamic													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	100	63.73	72.12	73.86	79.37	N/A	77.82
8	**Parsian Bank**	Islamic													
	Efficiency		N/A	40.08	65.95	75.64	100	100	81.95	92.86	80.4	90.32	91.53	N/A	81.87

6.1.4.3 Iraqi banks' efficiency

Iraqi Banks examined in this research consist of five commercial banks, two Islamic banks and two investment banks. The Trade Bank of Iraq, which is a commercial bank, has the highest efficiency level among Iraqi banks, over the research period. The second best performing bank in Iraq is Investment Bank of Iraq SA (although this bank has specifically the word '' investment'' in its name, it has been categorized as a commercial bank by BankScope) with an overall technical efficiency value of over 49% during 2005-2008 which is the period when data is available for this bank.

Although Iraqi banks in general perform less efficiently than other countries' banks, Trade Bank of Iraq SA is a fully efficient bank with a super efficiency value of 116.89. Only 1.8% ($\frac{1}{53}$) of DMUs operating in Iraq are fully efficient.

Iraqi banks' efficiency experienced a great variation over the research period. Appendix (B) illustrates the inputs and outputs changes of each bank over 2005-2011 which clarifies the variation in the efficiency scores during that period.

Table 6-9) Efficiency scores of banks operating in Iraq

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**Al-Bilad Islamic Bank for Investments & Financing**	Islamic													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	40.74	15.18	15.23	8.12	14.87	18.83
2	**Bank of Baghdad**	Commercial													
	Efficiency		N/A	N/A	N/A	N/A	N/A	26.44	29.72	42.09	42.16	27.41	21.71	30.74	31.47
3	**Dijlah & Furat Bank**	Investment													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	18.52	20.56	9.42	23.51	19.41	25.82	19.54
4	**Investment Bank of Iraq SA Co**	Commercial													
	Efficiency		N/A	N/A	N/A	N/A	N/A	77.12	84.18	87.96	92.61	95.13	95.88	97.82	90.1
5	**Kurdistan International Bank for Investment and Development**	Islamic													
	Efficiency		N/A	N/A	N/A	N/A	N/A	25.12	39.99	39.63	16.48	30.31	N/A	N/A	30.31
6	**National Bank of Iraq**	Commercial													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	36.35	34.94	7.67	17.06	11.93	11.93	19.98
7	**North Bank**	Commercial													
	Efficiency		N/A	N/A	N/A	N/A	N/A	38.47	34.41	31.48	26.57	29.72	33.24	36.47	32.91
8	**Trade Bank of Iraq**	Commercial													
	Efficiency		N/A	N/A	N/A	N/A	N/A	66.93	76.98	100	100	84.6	79.15	N/A	84.61
9	**United Bank for Investment**	Investment													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	13.57	26.99	33.43	52.19	48.9	35.02

6.1.4.4 Kuwaiti banks' efficiency

Out of nine Kuwaiti banks included in this research, six are commercial banks and the other three are Islamic banks. An overall view of the efficiency level of banks operating in Kuwait, shows that all four types of efficiency scores have been distributed more normally compared to the efficiency distribution of banks operating in Bahrain, Iran or Iraq.

Gulf Bank KSC has the highest average of overall technical efficiency among all the Kuwaiti banks over the research period. The operation of this bank in 2008 is observed as the only fully efficient DMU in Kuwait with a super efficiency value of 118.87%. No other technical or scale efficient bank can be observed among all Kuwaiti DMUs. Only 1.5% ($\frac{1}{67}$) of DMUs operating in Kuwait are fully efficient.

Looking for the least efficient banks, Table (6.13) shows that Boubyan Bank KSC and Kuwait International Bank have the smallest average efficiency values (33.22% and 38.95% respectively). These two banks are both Islamic banks.

Table 6-10) Efficiency scores of banks operating in Kuwait

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**Ahli United Bank KSC**	Commercial													
	Efficiency		30.82	35.36	42.03	46.7	53.64	52.75	52.59	54.02	59.89	56.04	56.25	N/A	49.1
2	**Al Ahli Bank of Kuwait (KSC)**	Commercial													
	Efficiency		N/A	N/A	N/A	N/A	N/A	73.89	81.78	72.93	68.27	60.99	60.34	N/A	69.7
3	**Boubyan Bank KSC**	Islamic													
	Efficiency		N/A	N/A	N/A	N/A	N/A	15.15	19.67	34.79	45.71	56.55	52.68	59.62	40.6
4	**Burgan Bank SAK**	Commercial													
	Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	64.65	63	58.72	47.97	50.66	57
5	**Commercial Bank of Kuwait**	Commercial													
	Efficiency		47.21	55.9	60.06	59.29	63.25	60.69	61.69	68.56	69.41	66.93	65.44	54.73	61.1
6	**Gulf Bank KSC**	Commercial													
	Efficiency		57.1	62.26	62.27	68.38	82.64	84.37	87.68	92.78	86.15	83.12	85.19	87.32	78.27
7	**Kuwait Finance House**	Islamic													
	Efficiency		63.43	58.83	63.71	64.8	59.67	55.42	59.93	76.07	66.92	65.03	64.37	65.05	63.6
8	**Kuwait International Bank**	Islamic													
	Efficiency		44.34	47.13	46.59	49.21	44.88	41.22	41.95	46.01	53.85	47.29	42.96	41.18	45.55
9	**National Bank of Kuwait**	Commercial													
	Efficiency		53.82	55.8	56.06	62.01	66	65.95	N/A	N/A	N/A	N/A	N/A	N/A	59.94

6.1.4.5 Omani banks' efficiency

Oman has the smallest number of banks over the study period. All the banks operating in Oman are commercial banks. Table (6.14) illustrates that the average of efficiency score of all Omani banks is over 40%. Omani banks are the same as Kuwaiti and Iraqi banks in that they do not contribute to the reference. Bank Muscat SAOG and HSBC Bank Oman has the highest and lowest level of efficiency score over research period. This fact indicates that the inefficiency of Omani banks is mostly caused by mistakes in management decisions or the execution of a proper policy towards the planned objectives of bank.

Table 6-11) Efficiency scores of banks operating in Oman

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**Bank Dhofar SAOG**	Commercial													
	Pure Technical Efficiency		52.42	54.53	53.42	60.15	61.72	65.12	74.66	78.14	74.85	79.35	74.12	79.94	67.37
2	**Bank Muscat SAOG**	Commercial													
	Pure Technical Efficiency		86.35	87.42	87.45	80.11	81.35	71.02	78.08	69.09	79.28	75.87	66.11	71.55	77.81
3	**Bank Sohar SAOG**	Commercial													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	52.23	57.02	65.03	67.14	69.64	62.21
4	**HSBC Bank Oman**	Commercial													
	Pure Technical Efficiency		53.71	49.68	52.9	44.56	49.09	54.38	55.95	42.33	46.44	42.38	41.38	39.16	47.66
5	**National Bank of Oman**	Commercial													
	Pure Technical Efficiency		62.47	66.16	65.13	51.94	55.56	48.68	61.53	67.43	75.37	69.39	63.18	71.61	63.2
6	**Oman Arab Bank SAOG**	Commercial													
	Pure Technical Efficiency		56.88	53.41	51.49	51.05	51.08	53.76	55.57	53.84	61.83	55.4	55.93	60.33	55.05

6.1.4.6 Qatari banks' efficiency

Nine Qatari banks have been examined in this research of which four of them are Islamic banks while 5 are commercial banks. Masraf Al Rayan, which is an Islamic bank, has the highest average efficiency score. Among the commercial banks Doha Bank and Ahi Bank QSC have the highest average efficiency score. Table (6.15) illustrates five fully technical efficient DMUs in Qatar over the study period (Masraf Al Rayan 2007, 2008, 2010; Qatar International Islamic Bank 2005; Qatar National Bank 2008, 2010).

The lowest average efficiency score for Qatari banks in this study belongs to a commercial bank, Al kalij which is a commercial bank. Table (6.15) shows which Islamic banks that operate in Qatar have a higher overall, technical and scale efficient value than commercial banks.

Table 6-12) Efficiency scores of banks operating in Qatar

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**Ahli Bank QSC**	Commercial													
	Pure Technical Efficiency		50.06	29.99	41.52	57.4	69.56	74.11	70.47	63.9	63.48	N/A	N/A	N/A	57.83
2	**Al Khalij Commercial Bank**	Commercial													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	27.69	29.6	31.75	31.57	41.3	32.38
3	**Commercial Bank of Qatar**	Commercial													
	Pure Technical Efficiency		39.36	43	49.91	45.02	40.26	42.93	52.09	62.76	55.3	57.34	57.71	64.75	50.87
4	**Doha Bank**	Commercial													
	Pure Technical Efficiency		45.53	42.22	49.34	50.95	57.94	78.25	75.21	73.29	64.52	58.61	56.43	58.01	59.19
5	**International Bank of Qatar**	Commercial													
	Pure Technical Efficiency		N/A	99.42	99.66	63.86	37.56	32.75	41.77	51.08	60.64	57.47	65.72	60.54	60.95
6	**Masraf Al Rayan (Q.S.C.)**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	100	100	83.32	100	100	96.66
7	**Qatar International Islamic Bank**	Islamic													
	Pure Technical Efficiency		95.76	85.67	44.92	50.88	52.07	100	85.08	58.73	53.61	47.49	45.26	44.94	63.7
8	**Qatar Islamic Bank SAQ**	Islamic													
	Pure Technical Efficiency		78.19	75.92	51.88	55.61	55.36	72.05	65.89	83.02	79.29	56.42	56.71	50.07	65.03
9	**Qatar National Bank**	Islamic													
	Pure Technical Efficiency		56.59	70.4	72.94	69.97	57.66	63.25	78.52	77.34	100	98.2	100	N/A	76.81

6.1.4.7 Saudi Arabian banks' efficiency

Table (6.16) shows the different types of efficiency of Saudi Arabian bank during 2000-2011. One can identify no fully efficient bank among all the 134 DUMs performing in this country. The best overall efficient DMU is Bank Al-Jazira in 2006 and the least overall efficient DMU is Arab Investment Company SAA with values of 92.83% and 12.48% respectively. Six DMUs out of 134 DMUs are efficient (Al Rajhi Banking & Investment Corporation-Al Rajhi Bank 2005, 2006, 2009, 2011; Bank Al-Jazira 2006 and Saudi British Bank 2006). These banks constitute nearly 4.5% of all the DMUs in Saudi Arabia.

Arab Petroleum Investments Corporation and Bank AlBilad have the least average efficiency score (29.92% and 34.33% respectively) while Saudi British Bank and Banque Saudi Fransi have the highest level of efficiency score (56.46% and 55.90% respectively).

One can observe from Table (6.16) that there is no fully efficient DMU among Saudi Arabian banks operating during the research period. This fact suggests that Saudi Arabian DMUs do not contribute to the reference set and best performing frontier.

Table 6-13) Efficiency scores of banks operating in Saudi Arabia

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**Al Rajhi Banking & Investment Corporation-Al Rajhi Bank**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	91.47	100	100	97.29	97.14	100	97.44	100	97.92
2	**Alinma Bank**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	67.49	68.82	46.15	37.65	50.86	54.19
3	**Arab Investment Company SAA**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	29.28	34.48	37.51	41.48	40.15	27.41	23.46	19.62	15.19	29.84
4	**Arab National Bank**	Commercial													
	Pure Technical Efficiency		39.56	39.49	45.25	49.58	69.29	83.81	89.56	82.43	81.46	67.13	62.01	66.86	64.7
5	**Arab Petroleum Investments Corporation - APICORP**	Investment													
	Pure Technical Efficiency		N/A	N/A	N/A	29.75	29	38.44	28.51	36.51	45.62	45.83	43.31	44.14	37.9
6	**Bank AlBilad**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	31.29	46.23	53.02	32.35	43.84	45.49	47.84	42.87
7	**Bank Al-Jazira**	Commercial													
	Pure Technical Efficiency		25.82	24.32	25.26	39.97	36.55	64.04	57.41	45.17	41.83	39.52	46.11	55.92	41.83
8	**Banque Saudi Fransi**	Commercial													
	Pure Technical Efficiency		48.05	49.11	53.96	63.99	76.28	88.46	93.86	84.84	91.1	83.39	86.71	92.02	75.98
9	**National Commercial Bank**	Commercial													
	Pure Technical Efficiency		69.59	69.98	66.18	62.86	67.5	78.05	92.93	88.64	57.95	71.36	81.7	94.65	75.12
10	**Riyad Bank**	Commercial													
	Pure Technical Efficiency		32.9	34.34	38.01	40.85	50.59	63.83	61.99	70.09	71.69	73.02	72.91	75.39	57.13

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
11	**Saudi British Bank (The)**	Commercial													
	Pure Technical Efficiency		46.92	47.37	53.67	66.09	71.87	88.53	94.46	89.76	100	84.74	76.82	91.14	75.95
12	**Saudi Hollandi Bank**	Commercial													
	Pure Technical Efficiency		54.45	56.83	57.44	59.89	63.94	79.27	74.83	66.44	79.8	67.7	68.32	69.25	66.51
13	**Saudi Investment Bank**	Investment													
	Pure Technical Efficiency		53.72	49.81	51.2	57.07	55.34	65.33	84.68	50.72	54.58	50.96	49.54	42.53	55.46

6.1.4.8 United Arab Emirates banks' efficiency

Table (6.17) shows that there are 23 banks operating in United Arab Emirates of which 15 are commercial, two are investment and six are Islamic banks. Although UAE has the highest number of DMUs in this research (236 out of 899) and United Arab Banks constitute ($\frac{27}{98}$) 27.5% of banks in this study, no fully efficient DMU has been observed for this country over the study period.

On the other hand, 13 DMUs (Abu Dhabi Commercial Bank 2007, 2008, 2009, 2011; Commercial Bank of Dubai 2006, 2008, 2009; Emirates NBD PJSC 2006, 2008, 2009; First Gulf Bank 2008, 2009, 2010) are full technically efficient banks which constitute 5.5 % of all the DMUs in United Arab Emirates

The higher belong to National Bank of Abu Dhabi (64.39%) and this DMU, by adopting best practise, could produce (100%-64.39%) 35.61% extra outputs than it actually did produce from the same level of inputs. Abu Dhabi Investment Company and Arab Bank for Investment & Foreign Trade-Al Masraf are the least overall efficient banks among United Arab Emirates banks with an overall technical efficiency value of 20.14% and 22.09% respectively.

Table 6-14) Efficiency scores of banks operating in United Arab Emirates

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
1	**Abu Dhabi Commercial Bank**	Commercial													
	Pure Technical Efficiency		71.94	65.72	62.58	64.17	74.04	85.08	93.96	100	100	100	94.56	100	84.34
2	**Abu Dhabi Investment Company**	Investment													
	Pure Technical Efficiency		35.38	33.74	33.63	32.95	23.9	27.29	15.84	18.57	15.34	20.58	9.98	10.38	23.13
3	**Abu Dhabi Islamic Bank - Public Joint Stock**	Islamic													
	Pure Technical Efficiency		15.77	27.7	33.04	56.13	60.62	70.36	77.61	62.09	78.07	72.08	74.93	68.32	58.06
4	**Al Hilal Bank PJSC**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.55	21.57	44.46	52.64	52.84	36.61
5	**Amlak Finance PJSC**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	31.19	44.63	52.1	66.07	84.32	82.24	99.75	N/A	65.76
6	**Arab Bank for Investment & Foreign Trade-Al Masraf**	Commercial													
	Pure Technical Efficiency		20.12	13.53	14.38	17.39	22.76	28.37	31.02	32.19	35.23	41.82	36.81	27.58	26.77
7	**Bank of Sharjah**	Commercial													
	Pure Technical Efficiency		47.44	42.19	43.76	33.38	43.09	77.99	61.28	54.14	46.28	47.99	44.73	43.6	48.82
8	**Commercial Bank International**	Commercial													
	Pure Technical Efficiency		49.22	49.74	50.87	50.46	49.46	73.47	48.37	66.21	59.2	51	51.67	51.09	54.23
9	**Commercial Bank of Dubai**	Commercial													
	Pure Technical Efficiency		47.06	44.13	41.69	44.79	49.89	52.13	52.88	64.53	75.75	69.26	62.67	63.63	55.7
10	**Emirates Investment Bank PJSC**	Investment													
	Pure Technical Efficiency		86.45	84.23	81.54	79.12	85.22	96.42	65.47	76.6	79.35	80.28	83.96	82.49	81.76
11	**Emirates Islamic Bank PJSC**	Islamic													

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	38.79	64.56	64.16	70.25	49.09	34.82	29.98	50.24
12	**Emirates NBD PJSC**	Commercial													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	100	91.54	100	100	91.84	94.65	96.34
13	**First Gulf Bank**	Commercial													
	Pure Technical Efficiency		35.55	31.57	38.31	54.96	44.24	54.43	62.97	84.28	100	100	100	62.59	64.08
14	**Invest Bank**	Commercial													
	Pure Technical Efficiency		28.97	38.64	30.12	28.34	28.27	60.26	33.48	31.93	31.26	29.13	30.61	27.07	33.17
15	**Mashreqbank**	Commercial													
	Pure Technical Efficiency		53.53	57.1	59.92	66.56	71.42	74.41	77.18	55.01	50.66	49.04	N/A	N/A	61.48
16	**National Bank of Abu Dhabi**	Commercial													
	Pure Technical Efficiency		69.81	73.06	70.91	76.77	83.94	100	91.31	N/A	N/A	N/A	N/A	N/A	80.83
17	**National Bank of Fujairah**	Commercial													
	Pure Technical Efficiency		34.12	35.56	36.93	36.53	42.7	42.43	53.4	59.4	65.97	60.39	63.01	69.74	50.02
18	**National Bank of Ras Al-Khaimah**	Commercial													
	Pure Technical Efficiency		38.98	39.59	40.48	43.4	51.13	60.51	70.17	73.57	73.55	67.9	70.56	70.16	58.33
19	**National Bank of Umm Al-Qaiwain**	Commercial													
	Pure Technical Efficiency		35.4	34.87	38.96	40.76	47.36	51.19	44.98	52.83	57.02	49.5	45.68	40.92	44.96
20	**Noor Islamic Bank**	Islamic													
	Pure Technical Efficiency		N/A	N/A	N/A	N/A	N/A	N/A	N/A	31.52	45.02	32.53	27.48	39.16	35.14
21	**Sharjah Islamic Bank**	Commercial													
	Pure Technical Efficiency		N/A	N/A	42.07	45.23	49.04	41.55	38.15	41.53	37.31	35.67	33.29	35.4	39.92

		Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
22	**Union National Bank**	Commercial													
	Pure Technical Efficiency		59.58	59.66	59.54	62.93	81.75	78.71	73.52	82.63	92.8	74.25	77.78	78.02	73.43
23	**United Arab Bank PJSC**	Commercial													
	Pure Technical Efficiency		55.95	55.95	53.08	55.94	53.48	55.81	54.8	53.94	64.86	54.85	55.63	N/A	55.84

6.1.5 Conclusion Section

The first section of this findings and discussion chapter endeavours to evaluate the extent of overall technical, pure technical, scale and super efficiency in MEOE banking sectors using cross-sectional data for 98 banks during 2000-2011. This study follows an intermediation approach to select input and output variables. The input vector contains fixed assets, deposits and equity while output vector contains loans and net income. The results of efficiency scores have been reported through different countries and different operational styles in tables (6.9) to (6.17).

6.2 Bank Performance and Oil Revenue

In the second section of chapter six the impact of the oil revenue of a country on the performance of its banks will be investigated. The variable used to proxy oil revenue is Oil Export Dependency (OED) which is the ratio of oil income to GDP (More details about this variable have been provided in sections 4.2.1 and 5.4. This investigation is applied to panel data of 98 banks during 2000-2011. There are two popular statistical models for meta-analysis of panel data, the fixed-effect model and the random-effect model. Although these two models employ similar sets of formulas to compute statistics, these two models are fundamentally different. The selection of an appropriate model is decided by running Hausman's (1978) test. Hausman's test evaluates the significance of an estimator versus an alternative estimator. In panel data, it is being used to distinguish between a fixed effects models and a random effects model. The Hausman test checks a more efficient model against a less efficient; however, the more efficient model should also give consistent results. In this study Fixed Effects (FE) is preferred due to higher efficiency, while the alternative Random Effects (RE) is least consistent and thus not preferred.

To find out if oil revenue impacts the performance of banks and, if it does, whether it is a direct impact or indirect. Firstly, only bank-specific and OED variables were included in a fixed effect regression model. If the impact of OED on the performance of the banks is insignificant then it will be concluded that the degree of dependency of an economy on its oil revenue is not related to bank performance. Otherwise, if the OED turns out to be significant, the next step is to distinguish between the direct and indirect impact. Therefore, country-specific variables are to be included in the regression model. If OED remains significant after including macro-variables, it can be concluded that the dependency of an economy on its oil revenue has a direct impact on bank performance, otherwise it will be concluded that the impact of OED on bank performance is indirect and channelled through country-specific variables.

6.2.1 The Impact of Oil Revenue on Bank Performance

In order to analysis the effect of oil revenue on the efficiency of banks, first only bank-specific and oil export dependency variables are included in the model. If the impact of oil revenue is insignificant, then it will be concluded that oil revenue is not related to bank efficiency. Otherwise, if the impact of oil revenue is significant, then it should be found out that if this effect is direct or indirect. In the case of an indirect impact,

macroeconomic factors must play a mediating role. For this reason, country-specific variables will be introduced into the model. These variables are proxies for possible transmission channels of oil prices. If after entering country-specific variables, the impact of oil exports dependency still remains significant, then it can be concluded that oil export dependency impacts bank performance directly. Otherwise it will be concluded that oil export dependency impacts bank performance through country-specific variables. It is important to mention that causality runs from oil export dependency to country-specific variables but not vice versa. The reason is the share of oil exporting countries in the global economy is not so large as to drive world oil prices (Heiko and Poghosyan, 2009).

In banking studies which apply profitability variables such as return on assets, (ROE) or return on equity (ROE), because of the persistency nature of dependent variable the system Generalized Method of Moments (GMM) estimator proposed by Blundell and Bond (1998) has been used to analyse the relationship between bank performance and the independent variables. In this model the lagged value of the dependent variable will be included in the regression as an independent variable. However, after reviewing bank efficiency studies in the literature which applied a two-stage DEA technique, a panel static technique has been applied in this research.

6.2.2 Does Economic Dependency of a Country to oil Revenue Impact Performance of its Banks?

In order to abstract the impact of oil revenue on the efficiency of banks, two different models were used. In model (1) the bank-specific determinants and the oil export dependency variable are contemporaneous. In model (2) one period lagged value of bank-specific variables has been used to account for simultaneity of the bank-specific variables.

To the best of author's knowledge in the two-stage DEA technique, this is the first study in which the lagged values of the environmental variables have been included in the model to investigate their impact on the efficiency of banks and the first study to include environmental variables in two stages. Therefore, there is not enough evidence in the literature to compare the result of these models, including lagged values of banks-specific variables in this study, with them.

In order to provide a better approximation of the potential impact of bank-specific independent variables on efficiency at time t, one set of period lagged values of bank-specific variables have been included in model (2). Moreover since the value of bank-specific variables at time t are not separated from their value at time t-1 and followed by ideas of Albertazzi and Gambacorta (2009) who include the lagged value of some of the environmental variables in the static panel model to investigate their impact on profitability of banks, the idea of including lagged values of bank-specific variables arises. In this study the result from two models will be compared.

In the first model in which we use contemporaneous variables, we have 899 observations along with 98 banks while in the next model the number of observations is reduced to 801 as the result of using lag values. In this study the significance level has been set as 5% as it has been set in similar studies. Therefore, any significance at 10% will be considered as insignificant. The results of two models are indicated in Table (6.18).

Table 6-15) Oil revenue and bank efficiency (Only bank-specific variables)

VARIABLES	Model(1)	Model(2)
EQTA	-0.107**	-0.288**
	(0.221)	(0.140)
LATD	-0.0159	-0.0247
	(0.0133)	(0.0156)
LLR	-0.330*	-0.318**
	(0.183)	(0.132)
SIZE	3.244**	1.347*
	(1.446)	(1.403)
OED	0.542***	0.678***
	(0.151)	(0.140)
Constant	-15.30	16.32
	(21.80)	(21.09)
Observations	899	801
R-squared	0.311	0.337
Number of id	98	98

The dependent variable is the bank efficiency measure. Explanatory variables in model (1) are contemporaneous values of bank specific variables and OED (oil export to GDP ratio). In model (2), we use one period lagged value of bank specific variables to account for simultaneity of bank specific variables. Models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.
* Coefficients are statistically significant at the 10% level.
** Coefficients are statistically significant at the 5% level.
*** Coefficients are statistically significant at the 1% level.

Table (6.18) demonstrates a significant positive relationship between the OED of a country and the efficiency of its banks. Our results show that the OED remains robust in terms of direction under two models. For both models the OED is statistically significant and the coefficient of OED is larger under model (2). Therefore, it can be concluded that there is positive significant relationship between oil revenue injected to

an economy of an oil exporting country and the efficiency of banks operating in that country.

In terms of capitalization Table (6.18) demonstrates a negative statistically significant relationship between efficiency and EQTA for both models (2). This means that both the contemporaneous and lagged value of EQTA impacts the efficiency of banks negatively. Although EQTA is a ratio which demonstrates health and long-term profitability of the bank, the negative relationship between of EQTA and the efficiency of banks is not surprising. This negative relationship result is consistent with the findings of Akhigbe and McnNulty (2005) and Sufian (2009). These findings imply that the more efficient banks use more leverage (less equity) compared to their peers. This suggests that the less efficient banks could be involved in processes which tend to hold more equity (Sufian, 2009). Hermes and Nhung (2010) claim that low capital ratios (capital to asset) encourage banks to undertake risky business by investing in highly profitable projects and report a negative relationship between efficiency and capital ratio.

However, Pasiouras (2008) shows a positive relationship between capital and efficiency This finding is in contrast with Berger (1995), Dermiguc-Kunt and Huizinga (1999), Staikouras and Wood (2003), Goddard et al. (2004), Pasiouras and Kosmidou (2007), and Kosmidou (2008) who claim that well capitalized banks decrease their cost of funding and the cost of going bankrupt is less for them compared to less well capitalized banks. In addition they argue that a strong capital structure for banks operating in developing countries is crucial. The reason for such an argument is that these banks need additional strength to withstand financial crises and increased safety for depositors during unstable macroeconomic conditions.

The liquid to deposit ratio reveals an insignificant relationship between bank efficiency and liquidity for both models. Altunbas and Marques (2008) and Molyneux and Thornton (1992) that imply that maintaining a generous liquidity ratio is expensive and that liquidity holdings impose a cost on the bank. Sufian and Habibullah (2009) indicate a negative relationship between bank efficiency and the level of liquid assets.

For credit risk, as expected, LLRTL has a significant negative impact on bank efficiency for both models. The results demonstrate that banks which hold lower ratios of loan loss reserves to total assets are more efficient. The loan loss reserve reflects anticipated losses by bank managers and a larger ratio of loans loss reserve to total loans

shows that banks have put aside a portion of their assets for possible defaults in loan repayments. Therefore, a larger loan loss reserve to total assets ratio reflects that a larger proportion of assets has been put aside and there has been no interference in bank activities. Hence, banks with the larger LLRTA ratio are less efficient because they have a larger proportion of assets kept back for possible losses. These results are consistent with the findings of Poghosyan and Hesse (2009) and Kosmidou et al. (2005) which show that LLRTL has a negative impact on the profitability of banks. Moreover, Moussawi and Obeid (2011) and Al-Muharrami (2007) demonstrate a negative relationship between efficiency and credit risk.

In terms of size, these results reveal that there is a significant positive relationship between bank efficiency and the size of bank in model (1) and (2). The results indicate that the larger the assets of a bank, the better the efficiency score of that bank. Olson and Zoubi (2012) state that there could be potential explanations for the positive impact of size on bank performance. Larger banks are better equipped to adjust their optimal mix and scale of outputs and hence increase their efficiency. The positive relationship between size and efficiency in models (1) and (2) supports the results of Sufian and Habibollah (2009), Kosmidou (2008), Hauner (2005) and Spathis et al. (2002).

However, Stavarek (2004), Altunbas et al. (2007), Yilidirim and Philippatos (2007), Chortareas et al. (2012) and Sufian and Abdul Majid (2007), all reveal a statistically negative significant sign for the size coefficient. They state that larger banks have a more complex organisational structure and moral hazard behaviour. The results of Table (6.18) have been summarized in Table (6.19).

Table 6-16) Significance and Size OED and bank-specific variables for all models

		Model (1)	Model (2)
OED	Significance	Y	Y
	Relationship	+	+
EQTA	Significance	Y	Y
	Relationship	-	_
LATD	Significance	N	N
	Relationship	_	_
LLRTL	Significance	N	Y
	Relationship	_	_
SIZE	Significance	Y	Y
	Relationship	+	+

Y: Yes Significant relationship (significance level has been set as 5%)
N: No significant relationship (significance level has been set as 5%)
+: Positive relationship
-: Negative relationship

From Table (6.19) it can be concluded that model (2) gives better results in terms of the number of significant variables and a significant coefficient of the OED variable. As illustrated in Table (6.18) and Table (6.19) the relationship between OED and the efficiency of banks is positive and statistically significant. Therefore, the oil revenue of the country impacts positively on the performance of its banks. EQTA impacts efficiency negatively and is statistically significant when lagged values of bank-specific variables are included in the model. The results show a negative insignificant relationship between LATD and efficiency in both models. While the coefficient of the LLRTL variable is significant and negative, the coefficient of the size variable is significant with a positive sign in both two models.

6.2.3 Does the Economic Dependency of a Country on Oil Revenue Impact the Performance of its Bank Directly or Indirectly?

Country-specific variables have been included in the model to investigate if the impact of oil revenue is direct or indirect. Similar to previous steps, two model regressions were run by including contemporaneous and one period lagged values of bank-specific variables.

In model (1) contemporaneous values of all variables have been used. In model (2) one period lagged values of bank-specific variables and contemporaneous values of country-specific variables and OED have been included. The results of these two models are illustrated in Table (6.20).

Table 6-17) Oil export dependency and bank efficiency (Bank-specific and country-specific variables)

Variables	Model (1)	Model (2)
EQTA	0.0675**	-0.353**
	(0.219)	(0.137)
LATD	-0.0192	-0.0290*
	(0.0120)	(0.0156)
LLRTL	-0.249	-0.254*
	(0.199)	(0.128)
SIZE	3.422**	1.434*
	(1.475)	(1.410)
INFLATION	0.323**	0.286***
	(0.133)	(0.101)
GDPGROWTH	0.0525**	0.0862**
	(0.129)	(0.106)
CONCENTRATION	-0.269*	-0.434**
	(0.143)	(0.126)
OED	0.573***	0.667***
	(0.166)	(0.157)
Constant	-14.01	22.01
	(21.91)	(21.34)
Observations	899	801
R-squared	0.336	0.374
Number of id	98	98

The dependent variable is the bank efficiency measure. Explanatory variables in model (1) are contemporaneous values of bank specific variables and OED (oil export to GDP ratio). In model (2), one period lagged value of bank specific variables to account for simultaneity of bank specific variables have been used. Models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.
* Coefficients are statistically significant at the 10% level.
** Coefficients are statistically significant at the 5% level.
*** Coefficients are statistically significant at the 1% level.

Table (6.20) illustrates that the OED coefficient is positive in both models which indicates a positive statistically significant impact of OED on bank efficiency after including country-specific variables. Similar to the results of Table (6.17) the OED variable is statistically significant at the 1% level and its coefficient has improved in model (2) which supports the idea that oil revenue impacts efficiency directly.

The results of Table (6.20) in both models support the idea that oil revenue impacts bank efficiency directly. The reason could be because the domination by the vast oil wealth of Sovereign Wealth Funds (SWF) that account for approximately 32.6 percent of the global SWF assets (this figure is for only six countries of MEOE region, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates). According to the SWF Institute, Saudi Arabia's Monetary Agency (SAMA) holds the prime position in the volume of assets, with an estimated USD 675.9bn followed by UAE's Abu Dhabi Investment Authority at USD 627bn; and subsequently Kuwait's Investment Authority at USD 386bn; Qatar's Investment Authority at USD 115bn; Bahrain's Mumtalakat Holding at USD11bn; and Oman's State General Reserve Fund at USD 8.2bn (World Finance, 2012). The origin of all these funds emanates from oil revenues which create a

national boom for the local financial services sector and the banks of these economies. The banks of these countries take advantage of healthy domestic conditions to deploy their assets toward lending, notably on corporate and infrastructure projects and, therefore, improving their performance.

Huge loan growth followed by rapid economic expansion and large capital investments results in an increase in the total loans of the MEOE countries over the period 2000-2011 of 470 %. (Total loans of MEOE banks in 2000 was thousand USD 161, 547,916 and this figure increased to thousand USD 924,204,925)[10] in 2011. The total assets of the banks grew significantly due to huge loan growth. The total assets of banks operating in MEOE countries increased 550% over the period 2001-2011 (thousand USD 456,708,794 in 2010 and thousand USD 2,960,238,207 in 2011)[11]. Lending and asset growth has also been supported by strong growth in the deposit base. The total deposit of the banking sector in the MEOE region in 2001 was thousand USD 310,535,755 and reached thousand USD 2,127,467,721 in 2011. This strong credit growth covers the private and public sectors which is a consequence of economic growth, increasing private consumption and large allocations in government spending for major development projects (IMF, 2012).

With respect to country-specific variables, Perry (1992) stated that the impact of inflation on bank performance depends on whether inflation is anticipated or unanticipated. In the unanticipated case, banks may be deliberate in modifying their interest rates which results in a faster rise of bank costs than bank revenues and consequently negatively affects bank performance. In anticipated cases, the banks increase their deposit interest rate at a lower rate than those on loans. Therefore, in the anticipated case, inflation causes revenues to increase faster than costs subsequently positive having an impact on bank performance. Espinoza and Prasad (2012) state that GCC policy makers conduct monetary policy and manage short-term and long-term liquidity conditions, and macroprudential instruments, in order to manage liquidity conditions and inflation. In other words, interest rates in these economies are adjusted, therefore, the impact of inflation is considered as anticipated. The results shown in Table (6.20) show a positive significant relationship between efficiency and inflation

[10] - BankScope
[11] - BankScope

which supports this statement. Moussawi and Obeid (2010) suggest similar results for Islamic banks operating in GCC countries.

GDP growth rate, which is a proxy for the overall economic development of a country, has a significant positive relationship with efficiency in both models. Gardener et al. (2010) and Grigorian and Manole (2006) find a positive significant relationship between economic growth and efficiency. Hermes and Nhung (2010) find that banks operating in more economically developed countries are more efficient because of the higher quality of financial institutions. Lensink et al. (2008) suggest that there is a positive impact of economic growth on efficiency since countries which are less wealthy have worse access to new technology. Yildirim and Philippatos (2006) claim that the more favourable the economic conditions the more supply and demand in the banking service which impacts positively bank efficiency. However, Thoraneenitiyan and Avkiran (2009) claim that the overall level of economic development is negatively associated with bank efficiency. The results of this study indicate that banks operating in economies with a higher level of economic development are more efficient due to the corresponding quality and skills of financial institutions.

The Herfidinhal Index which used in this research as a proxy for concentration shows the market share of the largest three banks in the whole banking system of a country. The results shown in Table (6.20) indicate a negative significant relationship between efficiency and market concentration. The result is in line with previous studies which demonstrate that imperfect competition may cause market power and lax market discipline in concentrated markets causes a negative association between market share with efficiency (Chortareas et al., 2012; Yildirim and Philippatos, 2007; Berger and Hannan, 1998). On the other hand, Olson and Zoubi (2012), Figueira (2009) and Figueira et al. (2011) report a positive statistically significant relationship between efficiency and concentration. Sufian and Habibollah (2009) state that there is a different sign of concentration coefficient when using an intermediation, production and profit approach. Table (6.21) summarises the results of Table (6.20) regarding the sign and significance of the variables in each of the two models.

In model (1), in which all contextual variables are contemporaneous, it can be seen that there is a positive significant relationship between OED and efficiency. It demonstrates that the more the share of oil revenue in GDP of an economy, the better the performance of banks in that economy. Table (6.20) shows insignificant relationships between bank

performance with LATD and LLRTL. The only two bank-specific variables which its contemporaneous value has with significant impact on the performance of banks are EQTA and SIZE. These results demonstrate that the larger banks are better performing and that well-capitalized banks are not necessarily the best performing banks. With respect to country-specific variables, there is a positive statistically significant relationship between INFL and efficiency while this relationship for CONCENTRATION is significant and negative. In other words, annual percentage of change in the Consumer Price Index (CPI) impacts efficiency positively while the Herfidenhal Index asset base impacts efficiency negatively. GDP growth influences the efficiency of banks positively.

The results of Model (2) indicate that when lagged values of bank-specific variables along with contemporaneous values of both country-specific variables and OED have been used in a regression model, OED has a statistically significant relationship with an efficiency similar to model (1). There is statistically significant negative relationship between lagged values of ETA, LATD and LLRTL which means that one period lagged values of capital, liquidity and credit risk impact negatively and significantly the efficiency of banks while lagged value of size of the bank does not impact bank efficiency. These significant results demonstrate that one period lagged values impact of efficiency in the current period. This may be explained as the cumulative nature of bank-specific variables.

Comparing the results of model (1) of Tables (6.18) and (6.20) shows that, after including country-specific variables, the LLRTL variable which was significant in Table (6.18) is no longer significant. It can be suggested that including macroeconomic variables in the model negates the impact of credit risk when all the variables have their contemporaneous values. For model (2) the results of Tables (6.18) and (6.20) illustrate that, after including country-specific variables, LATD changes to become insignificant. The coefficient of the SIZE variable which was significant in Table (6.18) changes to insignificance demonstrating that, after including macroeconomic variables, if the lagged valued of bank-specific variables are applied in the model, size does not impact the performance of banks.

Table 6-18) Significance and sign of OED, bank-specific and country specific variables for all models

		Model (1)	Model (2)
OED	Significance	Y	Y
	Relationship	+	+
EQTA	Significance	Y	Y
	Relationship	-	_
LATD	Significance	N	Y
	Relationship	_	_
LLR	Significance	N	Y
	Relationship	_	_
SIZE	Significance	Y	N
	Relationship	+	+
INFL	Significance	Y	Y
	Relationship	+	+
GDPGROWTH	Significance	Y	Y
	Relationship	+	+
CONCENTRATION	Significance	Y	Y
	Relationship	-	-

Y: Yes Significant relationship (significance level has been set as 5%)
N: No significant relationship (significance level has been set as 5%)
+: Positive relationship
-: Negative relationship

The results of this section of the research demonstrate that the impact of oil revenue measured as the ratio of oil income to GDP on bank performance after including country-specific variables remains significant which supports the idea that oil revenue impacts bank efficiency directly and indirectly. In other words, although oil revenue impacts the performance of banks significantly and directly, oil revenue may impact the performance of bank indirectly and through inflation and economic growth as well.

Considering the different operational styles which banks in the MEOE region are operating under, a question that the researcher is interested to answer is about which type of bank (commercial, investment or Islamic) has been affected most by oil revenue. This question will be answered in the following section.

6.2.4 Banks under Which Operational Styles are Most Affected?

To differentiate the impact of oil revenue on banks having different organisational structure, the interaction terms for oil export dependency with commercial, Islamic, and investment banks have been introduced. Interaction terms are defined as the product of OED and the operational style dummy variable, where each operational style has a dummy variable. Dummy1 takes a value of one if the bank operates under the

commercial style and zero otherwise. Dummy2 takes a value of one if the bank operates under the investment style and zero otherwise. Dummy3 takes a value of one if the bank operates under the Islamic style and zero otherwise.

Interaction term=OED*oil export dependency

Adding the statistical interaction term to the model helps to investigate possible disparities of the impact of oil revenue on banks operating with different organisational styles. Table (6.22) illustrates the result of regression for the two models.

The results of the significance of the capitalisation variable for the two models under Table (6.20) and Table (6.22) are similar. Equity to total asset ratio is statistically significant for model (2) with a negative coefficient, while it is insignificant for model (1). Liquidity and credit risk are both insignificant under both models. Table (6.22) illustrates that the size of the bank impacts the efficiency of the bank significantly and positively when all bank-specific variables have their contemporaneous values. Including operational style dummy variables in regression models does not change the significance, level of significance and sign of inflation and GDP growth variables in both models.

The results from Table (6.22) demonstrate that oil revenue in oil exporting countries does not impact the performance of investment and Islamic banks. There is no significant relationship between the efficiency of banks and investment and the Islamic dummy variable. However, oil revenue impacts the efficiency of commercial banks positively and significantly in both models. Overall, it can be concluded that oil revenue income does not impact the performance of investment and Islamic banks while it has significant impact on the performance of commercial banks.

Table 6-19) Oil revenue and efficiency of banks operating under different operational styles

Variables	Model (1)	Model (2)
EQTA	-0.0683**	-0.346**
	(0.219)	(0.143)
LITA	-0.0204*	-0.0289*
	(0.0116)	(0.0149)
LLRTL	-0.249	-0.238*
	(0.200)	(0.126)
SIZE	3.300**	1.435
	(1.478)	(1.409)
INFL	0.308**	0.276***
	(0.131)	(0.0955)
GDPGROWTH	0.0447**	0.100**
	(0.128)	(0.105)
CONSENTRATION	-0.244	-0.427***
	(0.150)	(0.129)
Islamic	0.317	0. 319
	(0.273)	(0.258)
Commercial	0.437**	0.554**
	(0.312)	(0.294)
Investment	-0.306	-0.350
	(0.454)	(0.581)
Constant	-11.87	23.06
	(21.70)	(21.14)
Observations	899	801
R-squared	0.346	0.387
Number of id	98	98

The dependent variable is the bank efficiency measure. Explanatory variables in model (1) are contemporaneous values of bank specific variables and OED (oil export to GDP ratio). In model (2), we use one period lagged value of bank specific variables to account for simultaneity of bank specific variables. Models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.
Interaction term result of multiplying dummy variables in OED; Dummy1 takes value of one if the bank operates under commercial style and zero otherwise. Dummy2 takes value of one if the bank operates under investment style and zero otherwise. Dummy3 takes value of one if the bank operates under Islamic style and zero otherwise.
* Coefficients are statistically significant at the 10% level.
** Coefficients are statistically significant at the 5% level.
*** Coefficients are statistically significant at the 1% level.

Fiscal expansion in MEOE economies followed by an increase in the price of oil injects oil revenue in to the economy, and our results demonstrate oil revenue impacts more significantly on commercial banks than the other two types of banks. Since commercial banks do not follow Sharia-law this creates more suitable opportunities for policy makers and government bodies while Islamic banks are eligible to participate only in those economic activities which are according Sharia-law. Therefore, Islamic banks are not preferable finance resources for all the economic development plans in MEOE countries. Moreover, although the Middle East is the origin of Islamic banking, the largest and most popular banks in some of these countries are not Islamic ones. For instance Qatar National Bank (QNB) which is a commercial bank was ranked as the World's Strongest Bank in 2012, ranking with 78 other banks. QNB is the only bank from MENA, according Bloomberg, which is ranked in 2012 (QNB report, 2012). National Commercial bank and Emirate NDB are the largest asset-based banks

operating in Saudi Arabia and United Arab Emirates respectively which are both commercial banks.

With the existence of these strong commercial banks most development economic plans which are designed and are being operated as a consequence of increasing oil revenue, are being financed through these banks not Islamic banks. Some of these strong commercial banks provide an array of investment banking services through their subsidiaries to corporate, government and institutional clients within their own countries and globally. Good examples of this kind of activities holding by commercial banks are QNB Capital (Qatar National bank's subsidiary), Emirate NBD securities LLC (Emirates NBD's subsidiary) and National Investors Group Holdings Limited (National Bank of Kuwait's subsidiary). It can be suggested that the performance of such an investment subsidiary and financial services group is so vast that it overwhelms the performance of investment banks and if oil revenue impacts positively and significantly on the investment banking services, this impact cannot be proved while strong commercial banks with investment services exist.

6.2.5 Section Conclusion

In this section the OED variable was used as a proxy of oil revenue to investigate the impact of oil revenue of a country on the performance of its banks. An un-balanced panel dataset consisting of 899 observations over period 2000-2011 was applied. Efficiency scores obtained from section 6.1 were used as a proxy for the performance of the banks. Firstly, to investigate whether oil revenue impacts bank performance or not, only OED and bank-specific variables were included in the model. The impact of oil revenue on the performance of banks was found to be significant. Next to see if this impact is direct or indirect, macro-economic variables were included in the model. The results show that the OED variable remains significant in both models. Therefore, it was concluded that oil revenue impacts the performance of banks directly. The increased share of the oil sector in GDP leads to a national boom for local banking and finance industries. Larger capital investment, business activities, private consumption, major development projects and larger allocation in government spending results in huge growth in loans, deposits and the assets of the banks all of which lead to improvement in bank efficiency.

The findings of this section give guidelines for managers of top banks to control for impact of environmental factors and, significantly, injected oil income on the

performance of their banks. Being aware of the relationship between injected oil income in economy and the performance of their banks, managers can structure better strategies by taking opportunities when the economy of the country benefits from surplus oil income and evading risks when it suffers from oil income deficit.

To answer the question about the performance of which banks were mostly affected by oil revenue, an interaction term was introduced as the product of the operational style dummy variable and the OED variable. The results show that the performance of commercial banks is mostly affected by oil revenue rather than the performance of investment and Islamic banks.

6.3 Bank Performance and Oil Price Changes

In Section 6.2 the impact of oil revenue on the performance of banks was investigated and in this section the impact of oil price changes on the performance of banks operating in MEOE countries will be examined. Oil price change variables have been identified in section 4.2. Using three proxies; real oil price increase, oil price shock and oil price volatility which for the last two proxies' negative and positive movement had been identified separately. Where ΔLn (OP) is the real oil price increase at time t, $ROILP^{+}$ is a positive oil price shock, $ROILP_t^{-}$ is a negative oil price shock, $OILVOL_t^{+}$ is positive volatility and $OILVOL_t^{-}$ is negative volatility in the price of oil. In order to investigate whether oil price changes impact efficiency or not, and if they do, whether this impact is direct or indirect, the same methodology which was applied in section 6.2 has been applied in this section. Two models have been conducted in this section. The first model applies contemporaneous values of bank-specific variables and the second model applies lagged-values of bank-specific variables.

6.3.1 Do Oil Price Changes Impact Bank Performance?

Table (6.23) illustrates the first model. Five types of price change proxies with contemporaneous values of bank-specific variables have been included in a regression. The results of Table (6.23) suggest that positive oil price shock, positive oil price volatility and real oil price increase impacts the performance of banks significantly while negative oil price shock and negative oil price volatility do not have any significant impact on the performance of banks. Significant results are consistent with the results of section 6.2 which demonstrate a positive relationship between oil revenue and bank performance.

Comparing Table (6.23) with Table (6.18) suggests that the results of model (1) of Table (6.18) for bank-specific variables are similar to the results of Table (6.23) for bank-specific variables for all five oil price changes variables. Since in section 6.2.2 the relationship between each bank-specific variable and bank efficiency has been discussed in detail and the findings of other scholars (Sufian, 2009; Pasiouras, 2008; Hermes and Nhung, 2008; Lozano-Vivas et al., 2002) have been explained, in this section there has been a brief discussion of this subject.

Table 6-20) Oil price changes and bank efficiency (contemporaneous value of bank-specific variables)

VARIABLES	Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
EQTA	-0.166**	-0.163**	-0.164**	-0.179**	-0.164**
	(0.222)	(0.222)	(0.221)	(0.222)	(0.221)
LATD	-0.0227	-0.0231	-0.0228	-0.0220	-0.0229
	(0.0138)	(0.0140)	(0.0137)	(0.0146)	(0.0138)
LLRTL	-0.361*	-0.365*	-0.358*	-0.333*	-0.359*
	(0.185)	(0.186)	(0.183)	(0.179)	(0.184)
SIZE	4.468***	4.505***	4.323***	5.778***	4.364***
	(1.451)	(1.446)	(1.437)	(1.494)	(1.440)
Δln (OP)	1.675**				
	(0.824)				
ROILP+		3.124*			
		(1.767)			
ROILP-			1.354		
			(1.411)		
OILVOLt+				2.651***	
				(0.663)	
OILVOLt-					1.343
					(0.829)
Constant	-13.99	-14.35	-12.27	-32.26	-12.87
	(22.88)	(22.79)	(22.72)	(23.51)	(22.78)
Observations	899	899	899	899	899
R-squared	0.287	0.285	0.288	0.301	0.387
Number of id	98	98	98	98	98

The dependent variable is the bank efficiency. ΔLn(OP) is the real price of oil at time t, $ROILP^{+}$ is a positive oil price shock, $ROILP_t^{-}$ is a negative oil price shock. $OILVOL_t^{+}$ is positive volatility and $OILVOL_t^{-}$ is negative volatility in price of oil. All models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.
* Coefficients are statistically significant at the 10% level.
** Coefficients are statistically significant at the 5% level.
*** Coefficients are statistically significant at the 1% level.

Table (6.23) illustrates that the coefficient of EQTA is negative and insignificant. This result supports the findings of Pasiouras (2008) in Greece, Isik and Hassan (2003a) in Turkey, Casu and Girardone (2004) in Italy and Rao (2005) in the United Arab Emirates. In terms of the liquid assets to deposit ratio, the negative relationship between the efficiency of a bank and LATD is consistent with the findings of Sufian and Habibullah (2009) and Altunbas and Marques (2008). Table (6.23) shows a negative significant impact of LLRTL on bank efficiency which is in line with the findings of

Moussawi and Obeid (2011) and Al-Muharrami (2007). The last bank-specific variable, size, has a significant positive impact on the performance of banks which is similar to the findings of Kosmidou (2008), Olson and Zoubi (212), Hauner (2005) and Sufian and Habibullah (2009).

The results of Table (6.23) have been summarized in Table (6.24). While liquidity and credit risk do not have statistically significant impact on efficiency, equity impacts efficiency significantly and negatively. The size of the bank impacts significantly and positively the bank's efficiency. In other words, the results suggest that less efficient banks may be involved in a process which tends to hold more equity while they have a relatively lower level of assets.

Table 6-21) Significance and Sign of oil price changes proxies and contemporaneous value of bank-specific variables

		Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
EQTA	Significance	Y	Y	Y	Y	Y
	Relationship	-	-	-	-	-
LATD	Significance	N	N	N	N	N
	Relationship	-	-	-	-	-
LLRTL	Significance	N	N	N	N	N
	Relationship	-	-	-	-	-
SIZE	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+
Oil price change proxy	Significance	Y	Y	N	Y	N
	Relationship	+	+	+	+	+

Y: Yes Significant relationship (significance level has been set as 5%)
N: No significant relationship (significance level has been set as 5%)
+: Positive relationship
-: Negative relationship

As Table (6.24) illustrates there is only a significant relationship between positive oil price changes, real oil price increase and the efficiency of banks. No significant relationship can be reported between negative oil price changes and efficiency in model (1).

In model (2), in order to provide a better approximation of the potential impact of independent variables on efficiency at time t, one period lagged value of bank-specific variables has been replaced in the regression. Table (6.25) shows that after replacing lagged values of bank-specific variables in the regression instead of contemporaneous values, all five oil price changes become statistically significant and the level of

significance of Δln (PO), ROILP+ and OILVOLt+ which were significant as shown in Table (6.23) have been improved.

These robust results suggest that regardless of the definition of oil price changes, there is a positive significant relationship between the efficiency of banks and oil price changes. Therefore, it can be claimed that while positive oil price changes relate to higher efficiency of banks, negative oil price changes relates to less efficiency of banks. In other words, when there is a positive oil price shock, oil price volatility and oil price increase, banks operating in the MEOE countries have a higher level of efficiency while when there is a negative oil price shock, oil price volatility and oil price increase banks have a lower level of efficiency.

In model (2), for all five oil price proxies there is a negative and significant relationship between the value of EQTA in period t-1 and efficiency. In terms of lag value of LATD, the results shown in Table (6.25) demonstrate that there is an insignificant relationship between bank efficiency and liquidity. As for credit risk, the results show that by applying one period lagged value of this variable, results in a significant positive relationship between the ratio of loan loss reserve to total loans and the efficiency of banks. The lagged value of size along with the contemporaneous value of size, both have significant positive relationship with the efficiency of banks.

The results shown in Table (6.25) have been summarized in Table (6.26) which makes a comparison between the two models more understandable. Table (6.26) shows that in Model (2) when all bank-specific variables are lagged, all variables are significant, except Liquidity. These results demonstrate that ratio of lagged values of equity to total asset and the ratio of loan loss reserve to total loans impact the efficiency of banks negatively while the lagged value of total asset of banks impacts efficiency positively. In other words, the capital, degree of credit risk and size of a bank in period t-1 influence the efficiency of the bank in period t. One reason which can explain this is the cumulative nature of elements of financial statements. However, the ratio of lagged value of liquid asset to deposit which represents the liquidity of the bank in period t-1, surprisingly, does not impact significantly the efficiency of banks in period t.

Table 6-22) Oil price changes and bank efficiency (lagged value of bank-specific variables)

VARIABLES	Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
L.EQTA	-0.209**	-0.195**	-0.219**	-0.194**	-0.215**
	(0.135)	(0.137)	(0.135)	(0.132)	(0.135)
L.LATD	-0.0325*	-0.0319*	-0.0323*	-0.0330*	-0.0323*
	(0.0166)	(0.0162)	(0.0169)	(0.0177)	(0.0168)
L.LLRTL	-0.346**	-0.346**	-0.339**	-0.333**	-0.339**
	(0.138)	(0.141)	(0.133)	(0.139)	(0.134)
L.SIZE	2.890**	3.069**	2.678**	4.378***	2.743**
	(1.347)	(1.350)	(1.343)	(1.423)	(1.345)
Δln (PO)	3.021***				
	(1.040)				
ROILP+		5.422***			
		(1.935)			
ROILP-			2.744**		
			(1.353)		
OILVOLt+				2.872***	
				(0.672)	
OILVOLt-					2.346**
					(0.907)
Constant	17.81	15.10	20.21	-2.742	19.18
	(21.26)	(21.30)	(21.24)	(22.22)	(21.26)
Observations	801	801	801	801	801
R-squared	0.296	0.289	0.299	0.311	0.297
Number of id	98	98	98	98	98

The dependent variable is the bank efficiency. ΔLn(OP) is the real price of oil at time t, $ROILP^{+}$ is a positive oil price shock, $ROILP_t^{-}$ is a negative oil price shock. $OILVOL_t^{+}$ is positive volatility and $OILVOL_t^{-}$ is negative volatility in price of oil. One period lagged values of bank specific variables to account for simultaneity of bank specific variables have been used. All models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.

* Coefficients are statistically significant at the 10% level.

** Coefficients are statistically significant at the 5% level.

*** Coefficients are statistically significant at the 1% level.

Since there is not enough evidence in the literature on the investigation of the impact of lagged values of bank-specific variables on the efficiency of banks in time t, the researcher cannot compare the results with any other findings. Therefore, other scholars in future may do more research to investigate the impact of lagged values of bank-specific variables on efficiency.

Table 6-23) Significance and Sign of oil price changes proxies and lagged values of bank-specific variables

		Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
L.EQTA	Significance	Y	Y	Y	Y	Y
	Relationship	-	-	-	-	-
L.LATD	Significance	N	N	N	N	N
	Relationship	-	-	-	-	-
L.LLRTL	Significance	Y	Y	Y	Y	Y
	Relationship	-	-	-	-	-
L.SIZE	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+
Oil price change proxy	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+

Y: Yes Significant relationship (significance level has been set as 5%)
N: No significant relationship (significance level has been set as 5%)
+: Positive relationship
-: Negative relationship

After finding that oil price change variables impact bank efficiency, next step is to investigate whether this impact is direct or indirect. Therefore, in the next section, similar to section 6.2.3, country-specific variables will be included in both models.

6.3.2 Do Oil Price Changes Impact Bank Performance Directly or Indirectly?

To investigate if the impact of oil price variables on bank efficiency IS direct or indirect, country-specific variables have been included in the model as suggested by Heiko and Poghosyan (2009). In model (1) contemporaneous values of all variables have been used. In model (2), one period lagged value of bank-specific variables has been used. The results of these two models have been illustrated in Table (6.27) and Table (6.28).

The results of the regression model after including country-specific variables have been shown in Table (6.27). Among five different definitions of oil price change variables, it can be claimed that no significant relationship could be reported between oil price change definitions and bank performance. The results of Table (6.27) show that after including country-specific variables in Model (1), no changes in the significance and sign of the relationship between bank-specific variables and efficiency can be reported.

Table 6-24) Oil price changes and bank efficiency (country-specific variables and contemporaneous bank-specific)

VARIABLES	Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
EQTA	-0.116**	-0.114**	-0.115**	-0.150**	-0.115**
	(0.219)	(0.219)	(0.219)	(0.219)	(0.219)
LATD	-0.0250*	-0.0251*	-0.0249*	-0.0245*	-0.0250*
	(0.0128)	(0.0128)	(0.0127)	(0.0134)	(0.0127)
LLRTL	-0.276	-0.276	-0.276	-0.269	-0.276
	(0.203)	(0.204)	(0.202)	(0.197)	(0.203)
SIZE	4.714***	4.720***	4.680***	5.815***	4.693***
	(1.515)	(1.511)	(1.506)	(1.532)	(1.509)
INFL	0.377***	0.381***	0.373**	0.314**	0.375***
	(0.138)	(0.132)	(0.143)	(0.141)	(0.143)
GDPGROWTH	0.0419**	0.0461**	0.0480**	0.121*	0.0487**
	(0.130)	(0.143)	(0.124)	(0.140)	(0.124)
CONSENTRATION	-0.124**	-0.125**	-0.121	-0.126**	-0.122
	(0.148)	(0.148)	(0.147)	(0.151)	(0.147)
Δln (PO)	0.375				
	(1.043)				
ROILP+		0.763			
		(2.076)			
ROILP-			0.195		
			(1.850)		
OILVOLt+				2.302*	
				(0.877)	
OILVOLt-					0.275
					(0.972)
Constant	-16.47	-16.54	-16.14	-30.74	-16.31
	(23.18)	(23.12)	(23.12)	(23.26)	(23.15)
Observations	899	899	899	899	899
R-squared	0.309	0.309	0.309	0.318	0.309
Number of id	98	98	98	98	98

The dependent variable is the bank efficiency. ΔLn(OP) is the real price of oil at time t, $ROILP^{+}$ is a positive oil price growth rate, $ROILP_t^{-}$ is a negative oil price growth. $OILVOL_t^{+}$ is positive volatility and $OILVOL_t^{-}$ is negative volatility in price of oil. All models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.

* Coefficients are statistically significant at the 10% level.

** Coefficients are statistically significant at the 5% level.

*** Coefficients are statistically significant at the 1% level

Before concluding about the direct and indirect impact of this variable on the performance of banks and analysing the impact of country-specific variables on bank performance, the results of Model (2) will be reported. In model (2) contemporaneous values of bank-specific variables have been replaced by their lagged values. The results of this regression model under all five different definitions of the oil price change variable are shown in Table (6.28)

Table 6-25) Oil price changes and bank efficiency (country-specific variables and contemporaneous bank-specific)

VARIABLES	Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
L.EQTA	-0.276**	-0.275**	-0.282**	-0.256**	-0.280**
	(0.137)	(0.138)	(0.136)	(0.136)	(0.136)
L.LATD	-0.0352**	-0.0349**	-0.0350**	-0.0356**	-0.0351**
	(0.0166)	(0.0165)	(0.0168)	(0.0173)	(0.0168)
L.LLRTL	-0.261*	-0.252*	-0.262*	-0.266*	-0.261*
	(0.141)	(0.142)	(0.137)	(0.141)	(0.138)
L.SIZE	3.122**	3.195**	2.995**	3.983**	3.035**
	(1.406)	(1.417)	(1.406)	(1.517)	(1.408)
INFL	0.363***	0.388***	0.343***	0.318***	0.349***
	(0.113)	(0.107)	(0.115)	(0.109)	(0.114)
GDPGROWTH	0.210***	0.232***	0.230**	0.105***	0.232**
	(0.113)	(0.123)	(0.110)	(0.129)	(0.110)
CONSENTRATION	-0.299**	-0.303**	-0.287**	-0.294**	-0.290**
	(0.128)	(0.129)	(0.127)	(0.132)	(0.128)
Δln (PO)	1.147				
	(1.205)				
ROILP+		2.695			
		(2.179)			
ROILP-			0.000247		
			(1.717)		
OILVOLt+				1.878*	
				(0.861)	
OILVOLt-					1.135
					(1.015)
Constant	16.58	15.13	17.92	5.443	17.32
	(22.00)	(22.10)	(22.04)	(23.22)	(22.06)
Observations	801	801	801	801	801
R-squared	0.334	0.333	0.335	0.340	0.335
Number of id	98	98	98	98	98

The dependent variable is the bank efficiency. ΔLn(OP) is the real price of oil at time t, $ROILP^{+}$ is a positive oil price shock, $ROILP_t^{-}$ is a negative oil price shock. $OILVOL_t^{+}$ is positive volatility and $OILVOL_t^{-}$ is negative volatility in price of oil. One period of lagged values of bank specific variables to account for simultaneity of bank specific variables have been used. All models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.

* Coefficients are statistically significant at the 10% level.

** Coefficients are statistically significant at the 5% level.

*** Coefficients are statistically significant at the 1% level.

Table (6.28) shows that even by replacing lagged values of bank-specific variables by their contemporaneous values, no changes in significance of the five definitions can be reported. Therefore, it can be claimed that the impact of oil price shock on the performance of banks is an indirect impact and changes in the price of oil impacst bank performance indirectly.

The significant coefficient of macroeconomic variables may explain the indirect impact of changes in oil price on bank performance. Kandil (2011) stated that inflationary pressure is being reinforced by oil revenue in GCC countries after 2003, through higher government spending, higher growth of credit and aggregate spending and increase in public spending on capital. Bourke (1989), Moluneux and Thornton (1992) and Heiko. and Poghosyan (2009) stated that there is a link between bank profitability and the

interest rate. Fama (1975) suggested that banks adjust their interest rates according to inflation. He states that a predictable portion of the inflation rate integrates into nominal interest rate which has been adjusted by the banks. Therefore, oil income injected through the economy impacts inflation which affects the adjusted interest rate of banks which may result in better performance of the banks.

However, the significant and positive impact of GDP growth explains why any changes in price of oil in oil exporting countries in the Middle East region reflects on the economic growth of the particular country. The MEOE countries have experienced a period of rapid economic growth resulting in increasing GDP growth over the last decade. Expansion of government oil revenue in oil export dependent economies has driven expansion across the whole economy (Oslon and Zoubi, 2012). A key mechanism in the MEOE countries is fiscal expansion which injects oil revenue into the economy. Since oil upstream activities in the oil sector of these countries are controlled by state oil companies, oil revenues accrue directly and completely to the government. Government use the oil revenues firstly, via public expenditure (Capital and Current) which consequently increases the income of private households and corporate profits and this is followed by an increase in assets and deposits in the banking system. Secondly, the part of oil revenues that has not been converted into domestic currency will increase the foreign assets in the Central Bank or Sovereign Wealth Fund (Strum et al. 2009). The rising price of oil in last decade caused the economic growth of MEOE countries. The oil industry in these countries is mostly controlled by state-oil companies, therefore, oil revenues accrue directly and completely to the government.

Heiko and Poghosyan (2009) explained two reasons why an oil price shock could impact indirectly performance of banks. Firstly, an increase in the price of oil affects overall business sentiment and leads to higher domestic demand, higher bank confidence, lending and repayment rates. Secondly, on the aggregate supply side, a high oil price fuelled new public and private investment in oil exporting countries which pushed growth rates further and resulted in the expansion of productive capacity of all industries in these countries.

These results support the findings obtained in section 6.2 which reported the direct impact of oil revenue on the performance of banks. The findings are consistent with the report of Heiko and Poghosyan (2009) who suggested an indirect impact of oil price

shock on the profitability of banks in MENA. The results of Tables (6.27) and (6.28) have been summarized in Table (6.29) and (6.30).

Table 6-26) Significance and sign of oil price changes, country-specific variables and contemporaneous bank-specific

		Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
EQTA	Significance	Y	Y	Y	Y	Y
	Relationship	-	-	-	-	-
LATD	Significance	N	N	N	N	N
	Relationship	_	_	_	_	_
LLR	Significance	N	N	N	N	N
	Relationship	_	_	_	_	_
SIZE	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+
INFL	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+
GDPGROWTH	Significance	Y	Y	Y	N	Y
	Relationship	+	+	+	+	+
CONCENTRATION	Significance	Y	Y	N	Y	N
	Relationship	_	_	_	_	_
Oil price change proxy	Significance	N	N	N	N	N
	Relationship	+	+	+	+	+

Y: Yes Significant relationship,
N: No significant relationship
+: Positive relationship
-: Negative relationship

Table (6.29) shows that EQTA and Size of bank have significant impact on efficiency negatively and positively respectively, after including country-specific variables. Inflation and GDP growth impact the performance of banks positively while the asset concentration of banks influences the performance of banks negatively.

Table 6-27) Significance and sign of oil price changes, country-specific variables and lagged bank-specific

		Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
L.EQTA	Significance	Y	Y	Y	Y	Y
	Relationship	_	_	_	_	_
L.LATD	Significance	Y	Y	Y	Y	Y
	Relationship	_	_	_	_	_
L.LLRTL	Significance	N	N	N	N	N
	Relationship	_	_	_	_	_
L.SIZE	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+
INFL	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+
GDPGROWTH	Significance	Y	Y	Y	Y	Y
	Relationship	+	+	+	+	+
CONCENTRATION	Significance	Y	Y	Y	Y	Y
	Relationship	_	_	_	_	_
Oil price change proxy	Significance	N	N	N	N	N
	Relationship	+	+	+	+	+

Y: Yes Significant relationship
N: No significant relationship
+: Positive relationship
-: Negative relationship

Table (6.30) illustrates that when lagged values of bank-specific variables have been included in the model, EQTA, LATD and Size impact significantly the efficiency of banks while LLRTL does not impact the efficiency of banks. Moreover, inflation and GDP growth impact efficiency significantly and positively while concentration impacts negatively under both models.

6.3.3 Banks under Which Operational Styles are Most Affected?

In the section 6.2.4 the researcher presented an interaction term which was the product of the operational style dummy and oil export dependency in order to differentiate the impact of oil revenue on banks having different organisational structures. In this section the same interaction term has been applied but the oil revenue variable has been replaced by five different variables for oil price changes. Table (6.31) illustrates the results of including the interaction term in the regression model.

Regarding the interaction term, the findings demonstrate that dummy variables for Islamic and investment banks are not significant for any of the five definitions of oil price change variables. However, the commercial banks' dummy is significant for both

positive oil price shock and volatility. Therefore, it can be claimed that when there is a positive change in price of oil and when oil price changes have been measured as Δln (PO), it is only the performance of commercial banks in MEOE countries that have been affected by the changes in the price of oil. The performance of banks operating under two other operational styles does not relate to the changes in the price of oil in MEOE countries.

Table 6-28) Oil price changes and efficiency of banks operating under different operational styles

VARIABLES	Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
EQTA	0.113	0.110	0.112	0.111	0.112
	(0.218)	(0.218)	(0.218)	(0.221)	(0.218)
LATD	-0.0241*	-0.0236*	-0.0246*	-0.0203	-0.0246*
	(0.0126)	(0.0130)	(0.0125)	(0.0146)	(0.0125)
LLRTL	-0.273	-0.270	-0.279	-0.252	-0.279
	(0.201)	(0.205)	(0.199)	(0.196)	(0.199)
SIZE	4.703***	4.689***	4.612***	5.563***	4.631***
	(1.520)	(1.512)	(1.522)	(1.524)	(1.523)
INFL	0.380***	0.383***	0.364**	0.319**	0.368**
	(0.138)	(0.131)	(0.142)	(0.134)	(0.141)
GDPGROWTH	0.0428**	0.0533**	0.0495*	0.0995**	0.0498*
	(0.130)	(0.143)	(0.123)	(0.138)	(0.122)
CONSENTRATION	-0.120**	-0.130**	-0.126*	-0.128**	-0.125*
	(0.148)	(0.147)	(0.147)	(0.149)	(0.148)
Islamic	3.052	5.197	3.908	3.587	1.929
	(1.760)	(3.749)	(3.815)	(1.845)	(1.805)
Commercial	3.875**	8.632**	3.322	2.921**	1.868
	(1.857)	(4.039)	(4.132)	(1.942)	(1.943)
Investment	2.682	3.113	8.957	3.398	4.146
	(4.487)	(4.935)	(9.939)	(3.044)	(4.574)
Constant	-16.40	-15.98	-14.93	-26.54	-15.23
	(23.24)	(23.12)	(23.34)	(23.10)	(23.34)
Observations	899	899	899	899	899
R-squared	0.311	0.314	0.312	0.331	0.312
Number of id	98	98	98	98	98

The dependent variable is the bank efficiency. ΔLn(OP) is the real price of oil at time t, $ROILP^{+}$ is a positive oil price growth rate, $ROILP_t^{-}$ is a negative oil price growth. $OILVOL_t^{+}$ is positive volatility and $OILVOL_t^{-}$ is negative volatility in price of oil. All models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.
Interaction term result of multiplying dummy variables in oil price changes variables; Dummy1 takes the value of one if the bank operates under commercial style and zero otherwise. Dummy2 takes value of one if the bank operates under investment style and zero otherwise. Dummy3 takes value of one if the bank operates under Islamic style and zero otherwise
* Coefficients are statistically significant at the 10% level.
** Coefficients are statistically significant at the 5% level.
*** Coefficients are statistically significant at the 1% level

Before explaining and analysing the reasons behind the significant role of oil price changes in the performance only of commercial banks in MEOE countries, the contemporaneous values of bank-specific variables will be replaced by one period of lagged values of these variables and the regression models will be run again. This will be done in order to find out if there is any relationship between the changes in the price

of oil and the performance of banks operating under any of the other operational styles, other than the commercial one. Table (6.32) shows the results of the same regression model by replacing the lagged value of bank-specific variables with their contemporaneous values.

Table 6-29) Oil price changes and efficiency of banks operating under different operational styles (lagged value of bank-specific variables)

VARIABLES	Δln (PO)	ROILP+	ROILP-	OILVOLt+	OILVOLt-
L.EQTA	-0.275*	-0.277**	-0.271*	-0.290**	-0.271*
	(0.140)	(0.139)	(0.141)	(0.134)	(0.141)
L.LATD	-0.0363**	-0.0355**	-0.0363**	-0.0333*	-0.0364**
	(0.0170)	(0.0162)	(0.0174)	(0.0176)	(0.0175)
L.LLRTL	-0.266*	-0.255*	-0.267**	-0.255*	-0.266*
	(0.138)	(0.142)	(0.134)	(0.144)	(0.134)
L.SIZE	3.125**	3.168**	3.000**	3.636**	3.038**
	(1.403)	(1.415)	(1.406)	(1.523)	(1.407)
INFL	0.362***	0.389***	0.334***	0.335***	0.341***
	(0.112)	(0.106)	(0.112)	(0.108)	(0.112)
GDPGROWTH	0.206**	0.232**	0.227**	0.122**	0.228**
	(0.113)	(0.123)	(0.108)	(0.128)	(0.108)
CONSENTRATION	-0.295**	-0.307**	-0.290**	-0.299**	-0.291**
	(0.128)	(0.130)	(0.128)	(0.131)	(0.129)
Islamic	5.064	6.314	7.803	3.053	3.739
	(2.745)	(3.633)	(4.559)	(1.690)	(2.153)
Commercial	5.314*	9.681**	6.071	2.845*	3.179
	(2.795)	(3.727)	(4.781)	(1.670)	(2.259)
investment	5.285	1.577	11.52	3.413	5.407
	(4.988)	(4.859)	(9.952)	(2.889)	(4.599)
Constant	16.54	15.72	17.87	11.03	17.30
	(21.99)	(22.08)	(22.08)	(23.32)	(22.09)
Observations	801	801	801	801	801
R-squared	0.339	0.338	0.341	0.355	0.340
Number of id	98	98	98	98	98

The dependent variable is the bank efficiency measure defined as input VSR. ΔLn(OP) is the real price of oil at time t, $ROILP^{+}$ is a positive oil price growth rate, $ROILP_t^{-}$ is a negative oil price growth. $OILVOL_t^{+}$ is positive volatility and $OILVOL_t^{-}$ is negative volatility in price of oil. All models are estimated using fixed-effect estimators and p-values are calculated from Huber–White robust standard errors to control for clustering at individual banks.
Interaction term result of multiplying dummy variables in oil price changes variables; Dummy1 takes a value of one if the bank operates under commercial style and zero otherwise. Dummy2 takes a value of one if the bank operates under investment style and zero otherwise. Dummy3 takes value of one if the bank operates under Islamic style and zero otherwise
* Coefficients are statistically significant at the 10% level.
** Coefficients are statistically significant at the 5% level.
*** Coefficients are statistically significant at the 1% level

The relationship between the performance of banks operating under three different operation styles and oil price change proxies has been reported in Table (6.41). The findings show that it is only the performance of the commercial banks which has been affected by changes in oil price. This effect is significant only when oil price changes have been identified by Δln (PO), ROILP+ and OILVOLt+.

Therefore, comparing the results of Table (6.31) and (6.32) indicates that no matter whether the contemporaneous value or the lagged value of bank-specific variables has been included in the regression model, oil price changes impact the performance of commercial banks only. This finding supports the findings in section (6.2.4) which show that oil revenue in the MEOE countries impacts significantly the performance of commercial banks. However, Heiko and Poghosyan (2009) suggested that it is investment banks which been affected by oil price shocks in MENA countries during the period 1994-2008. They suggested that a boost in economic activities which are triggered by positive oil price shock impacts mostly the investment banks rather than the commercial banks and Islamic banks. The difference between the results of this research and the work of Heiko and Poghosyan (2009) may be due to different target samples and periods. Heiko and Poghosyan (2009) targeted eleven MENA banking industries of which four are located in North Africa. In addition the period of their investigation started in 1994 when many large commercial banks in the Middle East had not yet open investment activities windows or subsidiaries to be involved in investment activities. However, the main reason behind the difference could be that, as has been shown in this research, that commercial banks are more efficient banks than investment and Islamic banks in MEOE, while Heiko and Poghosyan (2009) claimed that investment banks were more profitable banks than the other two types of banks.

The results of Table 6.22 in section 6.2.4 illustrates that it is commercial banks' performance which has been affected by oil revenue. Positive changes in the price of oil leads to an increased oil revenue for the MEOE countries. It was claimed in section 6.3.3 that oil price changes impact performance of banks indirectly and through macroeconomic channels and inflation is one of these channels. An increased inflation rate leads to a higher adjusted interest rate in banks. However, Islamic banks are interest free banks and are not affected by the inflation rate which is a macroeconomic channel. Moreover, since Islamic banks fund themselves through Sukuk and Sharia-compliant deposits, they are not suitable options for economic development projects and governmental spending.

On the other hand, as it was explained in section 6.2.4 the existence of an array of investment banking services through large commercial banks in the MEOE countries, overwhelms the role of investment banks. Therefore, if oil price changes have any impact on investment banking activities, this impact is significant in commercial banks. Although Heiko. H and Poghosyan T. (2009) suggested that it is the profitability of

investment banks which has been affected by oil price shocks rather than commercial banks' profitability, the difference could be explained by the difference in the sample by means of which the hypothesis was examined. Heiko and Poghosyan (2009) selected their data from MENA countries and identified profitability as simply the ROA ratio, while in this research no banks from North African countries have been included and the efficiency score obtained through multi inputs and outputs have been identified as the performance of these banks.

6.3.4 Section Conclusion

In this section three different proxies for changes in the price of oil were introduced: Real increase in the price of oil, ΔLn(OP), positive and negative growth in the price of oil, $ROILP^{+}$ and $ROILP_t^{-}$, positive and negative volatility in the price of oil $OILVOL_t^{+}$ and $OILVOL_t^{-}$. The impacts of these five different proxies on the performance of MEOE countries were investigated. The methodology applied in section 6.2 was applied in this section as well.

The results demonstrate that the only positive oil price changes ($ROILP^{+}$ and $OILVOL_t^{+}$) and real increase in price of oil (ΔLn (OP)) impact the performance of banks operating in the MEOE region. Moreover, this impact is an indirect one which affects the performance of banks through macroeconomic channels. Funds injected into the economy as a result of an increase in the price of oil, leads to higher government spending, higher growth of credit and aggregate spending and increase in public spending on capital, which all cause inflation to increase. Banks adjust the interest rate to inflationary pressure which may result in higher revenue and profit.

The oil sector in MEOE countries is mostly composed of state-owned companies and oil revenue is accrued directly to government; therefore, any increase in the price of oil results in fiscal expansion and leads economic growth in all industries of these countries. In addition, positive oil price changes affect overall business sentiment and lead to higher domestic demand, higher bank confidence and lending and repayment rates. In the comparison of the impact of oil price changes on banks operating with different operational styles, it is the commercial banks which have been affected the most.

6.3.5 Chapter Summary

This chapter consist of three sections, the first section measures the performance of MEOE banks over the period 2000-2011, the second section investigates the impact of oil revenue on the performance of banks and the third section examines the impact of oil

The second section examines the impact of oil revenue on the performance of banks. Oil revenue has been measured by the ratio of oil income to GDP in each single year. This proxy also represents the independency of an economy to oil income. It is claimed that oil revenue influences the operation of banks directly. The increased share of the oil sector in GDP leads to a national boom for local banking and finance industries. Larger capital investment, business activities, private consumption, major development projects and larger allocation in government spending results in a huge growth in loans, deposits and assets of the banks, all of which tend to improve bank efficiency.

The third section, investigates the impact of oil price changes on the performance of banks. Five different proxies were applied as a measure of changes in the price of oil: real oil price increase, positive and negative oil price shock, positive and negative oil price volatility. The findings showed that positive oil price changes and real oil price increases affect the performance of banks indirectly and positively through macroeconomic channels, which are inflation and economic development. Oil income injected into the economy causes improvement in inflation which results in an increase in the interest rate which the banks adjust. Thus, the more interest gained from issuing loans leads to more revenue and income for the banks. Moreover, the increase in the price of oil results in fiscal expansion and causes economic development of all industries in oil exporting countries.

The last two sections control for the impact of oil price movement on the operation of different type of bank. It was concluded that commercial banks had been mostly affected by the movement of oil price rather than investment and Islamic banks.

Chapter 7 CONTRIBUTION TO KNOWLEDGE

In this chapter the contributions that this research has made to knowledge are discussed in detail in four sections. In the last section of this chapter a brief summary of all the contributions made to knowledge by this study is presented.

In this research three different aspects of contribution to knowledge have been made by evaluating the impact of oil price changes on the performance of banks. The three aspects are contribution to literature, implication and methodology. The first aspect is divided to two parts, the contribution to the Middle East Bank performance literature and the contribution to the oil price changes literature. In the following sections each of these aspects will be reviewed in detail.

7.1 Contribution to Literature

This study contributes to the literature from two different perspectives. The first perspective, which mostly was discussed in sections 2.3 and 6.1, contributes to the literature of banking performance studies of Middle East region. The second perspective fill the literature gap in oil price changes studies and links the performance of banks to oil price changes. In the following sections these two perspectives are discussed.

7.1.1 Contributions to Middle East Bank Performance Literature

This thesis adds several contributions to the Middle East banking performance studies especially those parametric and non-parametric OR techniques have been used to evaluate the performance of banks. First of all, this thesis fills the gap in banking efficiency studies that have mainly focus on banking industries in the Middle Eastern countries. Earlier studies of banks' performance in this region discussed the performance of banks operating in GCC countries) or MENA countries (Taufigh et al., 2009; Shamsher et al., 2008; Mostafa 2009; Emrouznejad and Anouz, 2010) or a single Middle Eastern country (Alkhatlan, 2011; Avkiran, 2009). This study is the first study which investigates the performance of banks operating in MEOE countries, which consist of GCC countries along with Iran and Iraq.

Second, this thesis studies three of the most important characteristics of MEOE banking industries in detail. Asset-size, concentration based on the assets of the five largest banks and ownership structure of the banking industry of each country, along with the operational styles that these banks operate under are analyzed with most updated data.

Third, to the best of the researcher's knowledge it is the first study among Middle East banking efficiency studies which compares the performance of banks operating under the three different styles: commercial banks, investment banks and Islamic banks. Although there are banking efficiency studies applying individual and cross- country data, only two styles have been applied in these studies: conventional banks and Islamic banks. (Sufian, 2009; Al-muharrami, 2008). The findings of this research demonstrate that investment banks operating in MEOE banking industries are overall less scale and technically efficient than commercial and Islamic banks.

7.1.2 Contribution to Oil Price Changes Literature

Another contribution of this thesis to the literature relates to oil price movement studies. Several studies have analyzed the relationship between oil price shock and economic activities, inflation, unemployment, stock market, monetary system, fiscal expansion, exchange rate and interest rate (Berument et al., 2013; Cunado and Perez de Gracia, 2005; Park and Ratti, 2008; Kilian, 2009; Hamilton, 2003; Chen et al., 2010). To the best of the researcher's knowledge this is the first research since the study of Hesse, and Poghosyan (2009) which links the performance of banks to oil price changes. However, there are four significant differences between the study of Hesse and Poghosyan (2009) and this study. First of all, Hesse, and Poghosyan apply only the ROA ratio as a proxy for measuring the profitably of banks while in this study the performance of banks has been measured through the carefull selection of inputs and outputs and by applying the DEA technique in order to obtain an efficiency score. Secondly, because of the persistent nature of the ROA ratio they employed a dynamic panel data technique while in this research a static panel data technique is employed. Thirdly, only oil price shock variables were included in the framework developed by Hesse, and Poghosyan (2009). However, in this thesis two groups of oil price variable have been included in the developed framework: oil price changes and oil revenue variables. Fourthly, in this research data are collected from MEOE countries for the period of 2000-2011, while in Hesse, and Poghosyan's (2009) study data was collected from eleven countries in MENA. Thus, this research extends the literature of oil price movement by including the bank efficiency score and oil revenue with existing oil price shock, oil price volatility and net oil price increase which has not been done before.

7.2 Contribution to Banking Efficiency Implications

This thesis also contributes to the literature of banking efficiency. In earlier studies the impact of many bank-specific and country-specific variables on the efficiency of banks has been investigated. Fethi and Pasiouras (2010) stated a list of environmental variables from which their impact on efficiency of banks was evaluated. In more recent studies some other bank-specific and country-specific variables have been added to the literature of banking efficiency, such as non-traditional activities and acquisition.

This study, for the first time, by applying two groups of oil price changes, oil price measurement proxies and oil export dependency variables, introduces a new application of efficiency measurement studies which are applicable in economic studies.

No study measuring efficiency by any parametric or non-parametric techniques has examined the impact of oil price changes or oil revenue as the main, or environmental variable, on the efficiency of banks. Oil price movements affect macroeconomic events which influences cash flows significantly in the finance and banking industry. This impact on economies which are dependent on oil income is more significant. In the literature there is only one study which links the changes in the price of oil to the performance of banks. Hesse, and Poghosyan (2009) studied the impact of oil price shock on the profitability of banks in MENA countries. They used a simple ROA ratio as measure of profitability.

7.3 Contribution to Two-Stage DEA Methodology

This thesis has three main methodological contributions. First of all, this is the first two-stage DEA study which includes contextual variables in two different steps in a second stage (regression model) and investigates the impact of contextual variables separately in each stage. In the literature many studies have applied a DEA two-stage technique to analyze the impact of different bank-specific and macroeconomic variables on efficiency. In all these studies contextual variables have been included in the regression model at the same time. However, in this study the banks-specific variables have been included and their impact on efficiency has been analyzed. In the next step macroeconomic variables have been included along with bank-specific variables and their impact on efficiency has been analyzed. The results of each step has been compared and discussed.

Another methodological contribution of the thesis is the adaption of including lagged values of bank-specific variables. To the best of the researcher's knowledge, it is the first banking efficiency study in which different models of values of contextual variables at different periods of time have been identified. This study, for the first time, evaluates the impact of one-period lagged value of bank-specific variables on the efficiency of banks along with contemporaneous values of bank-specific variables. Both types of variable were examined with and without out inclusion of macroeconomic variables.

Unlike, most studies on banking efficiency which apply a cross-sectional DEA frontier approach, in this thesis the panel data DEA frontier approach for 12 years has been applied and this study systematically analyzes time-invariant and time-varying fixed- and random-effect models.

7.4 Chapter Summary

In this chapter the contributions of this study were discussed. These contributions were categorized to three different aspects. First aspect explains how this thesis fills the gap from two different perspectives. The literature of Middle East bank performance studies and the literature on oil price changes studies. The first perspective includes an expansion of the banking efficiency literature to eight oil exporting countries in Middle East, investigation of banking industry characteristics in these countries and exploration of banking efficiency studies regarding three different operational styles, rather than two. The second aspect represents two new contextual variable groups which impact on the performance of banks operating in oil exporting countries. The third aspect develops a new framework for including bank-specific and country-specific variables in the two-stage DEA technique.

Chapter 8 CONCLSION

The thesis has developed a methodology to measure the performance of banks and then has analysed the impact of oil revenue and oil price movement on the performance of banks operating in MEOE countries. Banks provide range of financial services from services such as the primary intermediary role between lenders and borrowers of money to such sophisticated tools concerned with credit and liquidity provision, risk management and remittance of funds. Many studies have argued that the banking industry's performance may affect economic growth or may cause systematic crises (Fethi and Pasiouras, 2009). Thus, measuring the performance of banks and identifying the factors which may affect it, is an task of major interest for regulators, policy makers, stakeholders, investors and the general public. One significant factor in the economic context of oil exporting countries, and more significantly the economies which are dependent on oil revenue, is oil price movement. The study originated from the observation that there is only one study in the literature which detects the impact of oil price shock on the performance of banks. This chapter provides a summary of the findings of the thesis.

This chapter begins with overviewing the techniques which are applied to measure the performance of banks and the developed framework used to assess the impact of oil price movement on the performance of banks. A summary of the findings of this research and answers to the research questions are presented followed by an explanation of the policy implications of the research, stating the limitations and suggesting future researches.

8.1 Overview of the Research

The research has concentrated its efforts on finding out whether oil price movement impacts the performance of banks operating in oil exporting countries or not and, if so, if this impact is a direct or an indirect one. Findings in the theoretical literature search show that there is only one study which links bank performance to oil price movement (Hesse and Poghosyan, 2009). In that study, the performance of banks has been measured by the simple financial ratio ROA and the methodology used was dynamic panel technique because of the persistent nature of the dependent variable. In this thesis the performance of banks has been measured using the concept of efficiency and a static

panel technique has replaced dynamic panel technique followed by a review of the two-stage DEA technique in the literature.

In the efficiency literature, a set of best practice banks shape a frontier and performance for other banks will be identified by measuring the distance every bank's performance is away from that frontier. Thanks to the founding work of Farrell (1957), who first presented the economic efficiency idea, different efficiency measurement techniques have been applied in the past sixty years. In this research by adopting a non-parametric DEA technique four different efficiency measurements are obtained: PTE, SE, OTE and Super efficiency.

Before adopting the DEA-technique, identification of inputs and outputs are important. In the literature of banking efficiency, different approaches have been utilized to identify selections of inputs and outputs. In this research after reviewing the literature, an intermediation approach was selected. Under this approach banks are mediator agents between the demand for, and the supply of funds. Fixed assets, deposit, and equity compose the input vector while loans and net income shape the output vector in this study.

No matter what approach or what inputs and outputs are being used, the existing banking literature for the Middle East has mainly focused on banks operating in the GCC. This research, for the first time, introduces the new term "MEOE" countries which are Oil Exporting countries in the Middle East. Since the economies of these countries are dependent on oil production and oil exports, identifying the impact of oil income and changes in the price of oil on the performance of the banking industry, which is one of the most significant industries, is unavoidable. This study examines and analyses this impact for the first time by using an efficiency measure as a proxy of banks' performance.

Two groups of oil price proxies are applied in this research: first oil revenue, and second oil price changes. Oil revenue was measured by the ratio annual oil export revenue to GDP while the oil price changes group consists of three different proxies: oil price shock, oil price volatility and net oil price increase. To capture the impact of the environmental factors two groups of contextual variables were included in the model: firstly the bank-specific variables capitalization, liquidity and loan loss reserves and secondly, the country-specific variables inflation, economic growth and market concentration.

In order to find out if oil price impacts the performance of banks or not, and if so, whether this impact is direct or indirect, firstly bank-specific variables were included in the regression model and if the oil variable was significant, it was concluded that the oil variable impacts the performance of banks, otherwise there was no relationship between banks' performance and the oil variable. In the case that the oil variable was significant, in the next step country-specific variables were added to the model to investigate if the impact of the oil variable is direct or indirect. If the oil variable remained significant then it was suggested that the oil variable impacts the performance of banks directly and if not it was argued that the oil variable impacts the performance of banks indirectly and through macroeconomic variables.

To have a better analysis the bank-specific variables mentioned in the works of Albertazzi and Gambacorta (2009), Pasiouras et al., (2011), Fonseca and González (2008), were included in the model separately by two values, contemporaneous values and one period lagged values. Therefore, in total, 24 regressions were run up to this stage and the results were summarized in Tables (6.18) and (6.20), (6.23), (6.25), (6.27), (6.28). Twelve more regressions were run in order to examine the impact of oil variables on banks operating under three different operational styles (commercial, investment and Islamic banks). The results of these regressions are presented in Tables (6.22), (6.31) and (6.32).

In the following section of the research the conclusions about the efficiency measurement of banks operating in MEOE countries during the period of 2000-2011 using four different scores, which were presented in Section 6.1, are summarized. Moreover, the answers to the main research questions, which were asked in section 1.2 and were discussed and analysed in section 6.2 and 6.3, are presented.

8.2 Summary of Findings

This section summarizes the findings of this thesis which were presented and discussed in chapter six in three different sections. The first section analyses the efficiency of the MEOE banking industry through different perspectives. The second section discusses the impact of oil revenue on the efficiency of banks and the third section argues that the impact oil price changes the efficiency of banks.

The findings indicate that oil revenue affects the performance of banks in oil exporting countries significantly and directly. The increased share of the oil sector in GDP leads

to a national boom for local banking and finance industries. Larger capital investment, business activities, private consumption, major development projects and larger allocation in government spending results in a huge growth of loans, deposits and assets of banks which all lead to improvement in bank efficiency.

On the other hand, the results of analysing the impact of oil price movement variables on the performance of banks are not significant for all oil price movement proxies. The results suggest that only positive oil price movement ($ROILP^{+}$and $OILVOL_t^{+}$) and real increase in price of oil ($\Delta Ln(OP)$) impact the performance of banks operating in oil exporting countries while negative changes in the price of oil do not significantly influence the performance of banks. Another finding argues that $ROILP^{+}$, $OILVOL_t^{+}$ and $\Delta Ln(OP)$ affects the performance of banks through macroeconomic channels. It was claimed in section 6.3.3 that oil price changes impact the performance of banks indirectly and through macroeconomic channels and the most significant one of these channels is inflation. An increased inflation rate leads to a higher adjusted interest rate for banks. The oil sector in MEOE countries mostly consists of state-owned companies and oil revenue accrued directly by government, therefore any increase in the price of oil results in fiscal expansion and leads to the economic growth of all industries of these countries. In addition, positive oil price movement affects overall business sentiment and leads to higher domestic demand, higher bank confidence, lending and repayment rates.

Another finding of this thesis follows from investigating the impact of movement in price of oil on performance of banks operating under different styles. The results show that among three different types of banks operating in MEOE countries it is the commercial banks which have been affected the most. It can be argued that a positive movement in the price of oil significantly relates to the oil income of MEOE countries since most of the oil companies are state-owned organizations. Commercial banks in these countries which do not follow Sharia-law are better performing financial institutions than Islamic banks for policy makers and government bodies for being involved in economic development plans in MEOE countries. On the other hand, most of the large commercial banks have subsidiaries which offer corporate investment banking services.

8.3 Implication

This thesis consists of two parts; the results of the first part demonstrate efficiency scores while the results of the second part show the impact of the movement in price of oil on the performance of banks. This section provides recommendations for managers of banks to improve the performance of their banks and policy implications for policy makers to investigate how the banking industry of oil exporting countries can get benefit from economic booms as a consequence of increases in the price of oil.

8.3.1 Policy Implication

From the policy makers' perspective, our findings show that the oil income injected into the economy of MEOE countries, impacts the performance of banks through macroeconomic variables. Since this study is the first study to investigate the relationship between the oil income of oil exporting countries and their banks' performance and the findings show a significant relationship, the regulators of oil exporting countries should consider this new contextual variable in evaluating the performance of their banking industry. In addition, for policy makers of countries like Qatar, United Arab Emirates and Saudi Arabia which are looking to play the role of international financial hub in the region, the results of this study give them some insight into manipulating macroeconomic factors to improve the performance of their banks. For instance, although an increase in inflation generally has negative economic effects, however, our results suggest that one of the macroeconomic channels that positively relates to the performance of banks is inflation. Another policy consideration is that the movement in the price of oil and oil revenue could be applied for financial regulators with the aim of monitoring the performance of the whole banking industry of oil exporting countries.

8.3.2 Managerial Implications

From the managerial perspective, the determination of relative performance of banks operating under the three different operational styles will encourage managers to improve the performance of their banks. By measuring the relative performance of four different types of efficiencies gives a comprehensive view for the managers of top banks so as to have a better understating of how well their banks operate technically (in using inputs to produce outputs) and how well the banks perform at optimal scale.

For managers of banks, the study shows that bank-specific variables play a significant role in explaining efficiency distribution between banks. After controlling for bank-specific variables, at the global level managers of banks should also control for macroeconomic variables in measuring the performance of their banks.

Moreover, the results of this study will help top level managers of banks to be aware of the relationship between oil price movements and the performance of their banks and will help them in formulating better policies and strategies in taking on opportunities and avoiding possible risks which this movement may bring about.

8.3.3 Limitations

The findings of this thesis have certain limitations, but these shortcomings are motivation for future research. The first limitation of this study is that this study only focuses on profit efficiency, which is based on profit maximisation, however, if price data were available on a such a global dataset, measuring the cost-efficiency of banks operating in MEOE countries and investigating the impact of the movement in price of oil on the cost-efficiency of these banks would provide some insights for policy makers evaluating the robustness of empirically estimated efficiency levels.

The other limitation of this study is the number of observations included in dataset sample. The number investment banks compared to the number of Islamic banks and commercial banks is relatively small. For instance, Iran, Iraq and Oman do not have any investment banks participating in the dataset. Moreover, since only banks with consecutive observations for at least five years were considered in this study, a large number of banks which were missing one year of data in a period of five consecutive years were omitted from the dataset.

Another key limitation of the study is the unavailability of data for some countries. For instance, for banks operating in Iraq, data is available after 2004 and Bankscope does not provide data for Iranian banks after 2010. Although the techniques applied in this research for measuring the performance of banks is valid, however, the results of this application are specific to the used data. Different dataset (input and output variables, banks and time period) could produce different efficiency scores. Therefore, the other limitation of this study is the availability of data used to produce the efficiency score.

8.4 Recommendations for Further Research

Based on limitations, there are a number of potential possibilities for future research. This study sets out to evaluate the performance of banks by applying non-parametric

techniques. However, by applying parametric techniques such as the stochastic frontier approach could provide support to the results of this research and could lead to some insight into the advantages and disadvantages of different techniques.

In this study the impact of oil price movement and oil revenue on the performance of banks with different operational styles was assessed. Future research may investigate the impact of oil price movement and oil revenue on banks operating under different ownership structures (foreign and private ownership).

The researcher's approach to this study was to in vestige the impact of oil price on the performance of banks operating in oil exporting countries. This research could be set out from the perspective of oil importing countries. Further research could be exploring the effects of the movement in the price of oil on the performance of banks operating in oil importing countries.

Moreover, it may be useful in future research to distinguish between the impact of movement in the price of oil on the performance of banks operating in countries which are a member of OPEC and those which are not member.

Oil companies of the countries which were investigated in this research, are mostly state owned companies and the income from oil exports accrues directly to the government. In future research, data could be examined from oil exporting countries where a part of the oil industry is governed by the private sector as well.

In addition to all above the mentioned possible future studies, the framework used in this thesis could be applied to investigating the relationship between the movement in the price of oil and the performance of other related industries.

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Appendix (A) Unbalanced panel data set of banks in MEOE countries operating under different style, 2000-2011

	Bank	Country	Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1	ABC Islamic Bank (E.C.)	Bahrain	Islamic												
2	Albaraka Banking Group B.S.C.	Bahrain	Islamic												
3	Alubaf Arab International Bank	Bahrain	Commercial												
4	Arab Banking Corporation BSC	Bahrain	Commercial												
5	Arcapita Bank B.S.C.	Bahrain	Islamic												
6	Bahrain Islamic Bank B.S.C.	Bahrain	Islamic												
7	BBK B.S.C.	Bahrain	Commercial												
8	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	Bahrain	Investment												
9	BMI Bank BSC	Bahrain	Commercial												
10	Capivest	Bahrain	Islamic												
11	First energy bank	Bahrain	Islamic												
12	Future Bank B.S.C.	Bahrain	Commercial												
13	Gulf Finance House BSC	Bahrain	Islamic												
14	Gulf International Bank BSC	Bahrain	Commercial												
15	Investcorp Bank BSC	Bahrain	Investment												
16	Investors Bank BSC	Bahrain	Islamic												
17	Ithmaar Bank B.S.C.	Bahrain	Investment												
18	Khaleeji Commercial Bank	Bahrain	Islamic												
19	National Bank of Bahrain	Bahrain	Commercial												
20	TAIB Bank B.S.C.	Bahrain	Islamic												
21	United Gulf Bank (BSC) EC	Bahrain	Investment												
22	Bank Maskan	Iran	Islamic												
23	Bank Mellat	Iran	Islamic												
24	Bank Saderat Iran	Iran	Islamic												
25	Bank Sarmaye	Iran	Islamic												
26	Bank Sepah	Iran	Islamic												
27	Bank Tejarat	Iran	Islamic												
28	Karafarin Bank	Iran	Islamic												

	Bank	Country	Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
29	Parsian Bank	Iran	Islamic												
30	Al-Bilad Islamic Bank for Investments & Financing	Iraq	Islamic												
31	Bank of Baghdad	Iraq	Commercial												
32	Dijlah & Furat Bank for Development and Investment Joint Stock Company	Iraq	Investment												
33	Investment Bank of Iraq SA Co	Iraq	Commercial												
34	Kurdistan International Bank for Investment and Development	Iraq	Islamic												
35	National Bank of Iraq	Iraq	Commercial												
36	North Bank	Iraq	Commercial												
37	Trade Bank of Iraq	Iraq	Commercial												
38	United Bank for Investment	Iraq	Investment												
39	Ahli United Bank KSC	Kuwait	Commercial												
40	Al Ahli Bank of Kuwait (KSC)	Kuwait	Commercial												
41	Boubyan Bank KSC	Kuwait	Islamic												
42	Burgan Bank SAK	Kuwait	Commercial												
43	Commercial Bank of Kuwait SAK (The)	Kuwait	Commercial												
44	Gulf Bank KSC (The)	Kuwait	Commercial												
45	Kuwait Finance House	Kuwait	Islamic												
46	Kuwait International Bank	Kuwait	Islamic												
47	National Bank of Kuwait S.A.K.	Kuwait	Commercial												
48	Bank Dhofar SAOG	Oman	Commercial												
49	Bank Muscat SAOG	Oman	Commercial												
50	Bank Sohar SAOG	Oman	Commercial												
51	HSBC Bank Oman	Oman	Commercial												
52	National Bank of Oman (SAOG)	Oman	Commercial												
53	Oman Arab Bank SAOG	Oman	Commercial												
54	Ahli Bank QSC	Qatar	Commercial												

	Bank	Country	Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
55	Al Khalij Commercial Bank	Qatar	Commercial												
	Bank	**Country**	**Operational Style**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
56	Commercial Bank of Qatar (The) QSC	Qatar	Commercial												
57	Doha Bank	Qatar	Commercial												
58	International Bank of Qatar Q.S.C.	Qatar	Commercial												
59	Masraf Al Rayan (Q.S.C.)	Qatar	Islamic												
60	Qatar International Islamic Bank	Qatar	Islamic												
61	Qatar Islamic Bank SAQ	Qatar	Islamic												
62	Qatar National Bank	Qatar	Islamic												
63	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	Saudi Arabia	Islamic												
64	Alinma Bank	Saudi Arabia	Islamic												
65	Arab Investment Company SAA (The)	Saudi Arabia	Islamic												
66	Arab National Bank	Saudi Arabia	Commercial												
67	Arab Petroleum Investments Corporation - APICORP	Saudi Arabia	Investment												
68	Bank AlBilad	Saudi Arabia	Islamic												
69	Bank Al-Jazira	Saudi Arabia	Commercial												
70	Banque Saudi Fransi	Saudi Arabia	Commercial												
71	National Commercial Bank (The)	Saudi Arabia	Commercial												
72	Riyad Bank	Saudi Arabia	Commercial												
73	Saudi British Bank (The)	Saudi Arabia	Commercial												
74	Saudi Hollandi Bank	Saudi Arabia	Commercial												

	Bank	Country	Operational Style	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
75	Saudi Investment Bank (The)	Saudi Arabia	Investment												
76	Abu Dhabi Commercial Bank	UAE	Commercial												
77	Abu Dhabi Investment Company	UAE	Investment												
78	Abu Dhabi Islamic Bank - Public Joint Stock Co.	UAE	Islamic												
79	Al Hilal Bank PJSC	UAE	Islamic												
80	Amlak Finance PJSC	UAE	Islamic												
81	Arab Bank for Investment & Foreign Trade-Al Masraf	UAE	Commercial												
82	Bank of Sharjah	UAE	Commercial												
83	Commercial Bank International P.S.C.	UAE	Commercial												
84	Commercial Bank of Dubai P.S.C.	UAE	Commercial												
85	Emirates Investment Bank PJSC	UAE	Investment												
86	Emirates Islamic Bank PJSC	UAE	Islamic												
87	Emirates NBD PJSC	UAE	Commercial												
88	First Gulf Bank	UAE	Commercial												
89	Invest Bank	UAE	Commercial												
90	Mashreqbank	UAE	Commercial												
91	National Bank of Abu Dhabi	UAE	Commercial												
92	National Bank of Fujairah	UAE	Commercial												
93	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	UAE	Commercial												
94	National Bank of Umm Al-Qaiwain	UAE	Commercial												
95	Noor Islamic Bank	UAE	Islamic												
96	Sharjah Islamic Bank	UAE	Commercial												
97	Union National Bank	UAE	Commercial												
98	United Arab Bank PJSC	UAE	Commercial												

Appendix (B) Input and output values for banks in MEOE countries

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
1	ABC Islamic Bank (E.C.)	2005	233900	100	55700	3700	464700
2	ABC Islamic Bank (E.C.)	2006	138400	100	102900	5300	546400
3	ABC Islamic Bank (E.C.)	2007	177400	100	219100	50900	997600
4	ABC Islamic Bank (E.C.)	2008	257200	100	153000	25600	1126200
5	ABC Islamic Bank (E.C.)	2009	269400	400	176500	10100	945400
6	ABC Islamic Bank (E.C.)	2010	192900	200	219800	2100	844100
7	ABC Islamic Bank (E.C.)	2011	104700	200	227700	8100	764500
8	Albaraka Banking Group B.S.C.	2003	3459700	99700	490500	39300	2121800
9	Albaraka Banking Group B.S.C.	2004	4281200	111900	565900	54100	2517100
10	Albaraka Banking Group B.S.C.	2005	5330100	115300	767100	102900	3418300
11	Albaraka Banking Group B.S.C.	2006	6146700	131000	1211100	123700	4537700
12	Albaraka Banking Group B.S.C.	2007	8084400	163800	1569600	200800	6677800
13	Albaraka Banking Group B.S.C.	2008	8872400	160400	1550200	201000	7921600
14	Alubaf Arab International Bank	2007	203000	200	44400	4000	81900
15	Alubaf Arab International Bank	2008	407000	4400	102500	8200	106300
16	Alubaf Arab International Bank	2009	619700	6300	110700	8200	157800
17	Alubaf Arab International Bank	2010	848600	9500	224600	15400	278500
18	Alubaf Arab International Bank	2011	755200	11600	240600	26000	345871
19	Arab Banking Corporation BSC	2000	22126000	440000	2256000	163000	14039000
20	Arab Banking Corporation BSC	2001	21544000	406000	2306000	137000	14225000
21	Arab Banking Corporation BSC	2002	23159000	451000	1834000	-11000	14981000
22	Arab Banking Corporation BSC	2003	24789000	484000	2097000	123000	15921000
23	Arab Banking Corporation BSC	2004	10681000	143000	1892000	583000	6012000
24	Arab Banking Corporation BSC	2005	13491000	129000	1973000	135000	6833000
25	Arab Banking Corporation BSC	2006	16799000	127000	2118000	205000	8622000
26	Arab Banking Corporation BSC	2007	26867000	130000	2157000	149000	12329000
27	Arab Banking Corporation BSC	2008	22790000	114000	2088000	-836000	11931000
28	Arab Banking Corporation BSC	2009	20246000	123000	2581000	154000	10949000
29	Arab Banking Corporation BSC	2010	21218000	122000	3860000	199000	12186000
30	Arab Banking Corporation BSC	2011	18736000	121000	4019000	270000	11985000
31	Arcapita Bank B.S.C.	2007	1541100	204900	1067100	285700	179200
32	Arcapita Bank B.S.C.	2008	2491300	261500	1429800	362200	291200
33	Arcapita Bank B.S.C.	2009	1571200	32900	1598600	-87900	537300

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
34	Arcapita Bank B.S.C.	2010	1266600	66200	1060200	-559400	464300
35	Arcapita Bank B.S.C.	2011	1440100	80600	1117500	50200	512000
36	Bahrain Islamic Bank B.S.C.	2004	529787	27128	140426	9840	182447
37	Bahrain Islamic Bank B.S.C.	2005	652128	47872	191223	19681	288298
38	Bahrain Islamic Bank B.S.C.	2006	945479	60638	199202	34840	322340
39	Bahrain Islamic Bank B.S.C.	2007	1234574	51862	497872	66489	787500
40	Bahrain Islamic Bank B.S.C.	2008	1844681	207181	442553	59309	1298138
41	Bahrain Islamic Bank B.S.C.	2009	2021277	305851	373670	-51596	1594149
42	BBK B.S.C.	2000	2252128	36170	281383	34840	1147872
43	BBK B.S.C.	2001	2322606	40957	299202	43883	1082713
44	BBK B.S.C.	2002	2618351	42819	306383	53191	1427926
45	BBK B.S.C.	2003	2828723	40957	331117	61968	1752926
46	BBK B.S.C.	2004	3046543	38830	419681	68351	2033777
47	BBK B.S.C.	2005	3201064	44681	461170	77926	2114362
48	BBK B.S.C.	2006	3308777	50266	500000	87234	2494681
49	BBK B.S.C.	2007	3947872	52926	631117	79521	2998936
50	BBK B.S.C.	2008	4221011	56117	556649	71809	3596543
51	BBK B.S.C.	2009	4671543	74468	614362	93085	3373936
52	BBK B.S.C.	2010	4762766	77394	639628	103989	3394415
53	BBK B.S.C.	2011	5903458	76064	632979	84840	3741223
54	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2005	57900	11100	27200	7800	7700
55	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2006	51300	12800	46400	21100	3200
56	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2007	50300	300	71400	24600	1000
57	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2008	27300	500	43000	-14300	900
58	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2009	23900	500	23700	-33500	900
59	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2010	20200	400	25200	6400	900
60	BMB Investment Bank-Bahrain Middle East Bank B.S.C.	2011	18000	300	29000	3700	9200
61	BMI Bank BSC	2005	586170	2394	64096	10904	468883
62	BMI Bank BSC	2006	835904	3723	77128	13564	753192
63	BMI Bank BSC	2007	1079255	7447	102394	13032	870213
64	BMI Bank BSC	2008	1538564	25532	342021	-7979	1294947
65	BMI Bank BSC	2009	1221277	42021	299468	-44947	1031915
66	BMI Bank BSC	2010	1185638	47606	229787	-70479	824468
67	BMI Bank BSC	2011	1331117	44947	220479	-9043	929787

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
68	Capivest	2005	29100	600	34200	5800	24900
69	Capivest	2006	37800	1900	144500	10200	18800
70	Capivest	2007	147500	1500	163000	16100	7600
71	Capivest	2008	60800	17600	174300	9400	4500
72	Capivest	2009	36200	19300	139100	-25700	2100
73	Capivest	2010	36900	18400	90600	-46100	1385
74	Capivest	2011	24000	16500	100300	12400	19300
75	First energy bank	2007	124761	2942	987249	900	98731
76	First energy bank	2008	145621	3000	1000000	1800	123983
77	First energy bank	2009	171500	21000	1054700	14200	138500
78	First energy bank	2010	148800	14900	1039100	-10100	267200
79	First energy bank	2011	89500	11100	1042700	3500	317000
80	Future Bank B.S.C.	2006	889894	798	122340	16223	174468
81	Future Bank B.S.C.	2007	1110372	5319	154787	23670	221543
82	Future Bank B.S.C.	2008	1187234	6383	168351	28457	300798
83	Future Bank B.S.C.	2009	1121277	7979	196011	21809	314894
84	Future Bank B.S.C.	2010	986968	13298	234574	24202	403457
85	Future Bank B.S.C.	2011	990426	19415	256915	22340	375532
86	Gulf Finance House BSC	2007	1083100	3668	879600	343300	808100
87	Gulf Finance House BSC	2008	2111200	14689	966900	291900	69200
88	Gulf Finance House BSC	2009	1109500	11564	433300	-728400	29100
89	Gulf Finance House BSC	2010	704500	26505	116300	-349400	14400
90	Gulf Finance House BSC	2011	506700	25016	233400	400	26065
91	Gulf International Bank BSC	2000	5200	600	68500	7100	37400
92	Gulf International Bank BSC	2001	5600	1100	77700	9900	43200
93	Gulf International Bank BSC	2002	42600	1000	87700	13300	55100
94	Gulf International Bank BSC	2003	144600	800	105400	17100	144700
95	Gulf International Bank BSC	2004	164400	2100	250900	56700	264300
96	Gulf International Bank BSC	2005	659000	1700	352400	140400	701700
97	Gulf International Bank BSC	2006	696800	4400	667800	211900	786700
98	Gulf International Bank BSC	2007	1083100	3668	879600	343300	808100
99	Gulf International Bank BSC	2008	2111200	14689	966900	291900	69200
100	Gulf International Bank BSC	2009	1109500	11564	433300	-728400	29100
101	Gulf International Bank BSC	2010	704500	26505	116300	-349400	14400
102	Gulf International Bank BSC	2011	506700	25016	233400	400	26065
103	Investcorp Bank BSC	2000	639600	54200	805800	70000	267032
104	Investcorp Bank BSC	2001	669100	53100	876100	50100	287451
105	Investcorp Bank BSC	2002	827900	49200	1069800	75100	295300
106	Investcorp Bank BSC	2003	791300	51900	1104100	90100	333400

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
107	Investcorp Bank BSC	2004	879500	60900	869000	105400	326300
108	Investcorp Bank BSC	2005	755300	62900	1063700	130800	146800
109	Investcorp Bank BSC	2006	812400	66000	1381900	302300	146600
110	Investcorp Bank BSC	2007	943500	64900	1237200	151100	341100
111	Investcorp Bank BSC	2008	388100	74000	894700	-780600	224100
112	Investcorp Bank BSC	2009	338100	69000	994400	102100	247600
113	Investcorp Bank BSC	2010	413300	59200	1060300	140300	169800
114	Investcorp Bank BSC	2011	324600	54100	1043700	67400	188800
115	Investors Bank BSC	2003	8800	100	33000	4300	1000
116	Investors Bank BSC	2004	18400	200	42400	6000	1960
117	Investors Bank BSC	2005	7000	100	131000	52900	2500
118	Investors Bank BSC	2006	7200	100	140600	11300	4900
119	Investors Bank BSC	2007	6900	1600	129900	-10300	15200
120	Investors Bank BSC	2008	6900	1600	87700	-34900	9400
121	Investors Bank BSC	2009	6900	7100	66900	-21200	10653
122	Investors Bank BSC	2010	6900	3800	38800	-27300	6803
123	Investors Bank BSC	2011	6900	2900	35000	-4900	5871
124	Ithmaar Bank B.S.C.	2005	130300	2300	252800	37600	199562
125	Ithmaar Bank B.S.C.	2006	1976500	30700	984800	183800	1549002
126	Ithmaar Bank B.S.C.	2007	2455400	130900	1284400	188300	1987492
127	Ithmaar Bank B.S.C.	2008	3534200	124100	1149400	85200	2058000
128	Ithmaar Bank B.S.C.	2009	3926300	178500	937400	-251500	2189500
129	Ithmaar Bank B.S.C.	2010	4369000	215900	894000	-140000	2530100
130	Ithmaar Bank B.S.C.	2011	4339800	191800	809500	-61900	2775500
131	Khaleeji Commercial Bank	2006	139447	2287	113226	21239	31114
132	Khaleeji Commercial Bank	2007	341324	3668	359016	55415	200697
133	Khaleeji Commercial Bank	2008	838904	14689	366973	72617	372721
134	Khaleeji Commercial Bank	2009	905359	11564	336633	8245	510864
135	Khaleeji Commercial Bank	2010	782136	26505	314250	-17375	540452
136	Khaleeji Commercial Bank	2011	858739	25016	316285	1378	536053
137	National Bank of Bahrain	2000	2385106	40957	285904	44681	1056383
138	National Bank of Bahrain	2001	2455585	39628	350266	48404	1086436
139	National Bank of Bahrain	2002	2481649	37234	363830	51330	1226596
140	National Bank of Bahrain	2003	2818351	44681	394947	59574	1497606
141	National Bank of Bahrain	2004	3057447	48404	463564	75266	1791755
142	National Bank of Bahrain	2005	3342287	47074	580053	81383	1854787
143	National Bank of Bahrain	2006	3793351	45479	590691	98138	2085904
144	National Bank of Bahrain	2007	4362500	45479	647872	110638	2515957
145	National Bank of Bahrain	2008	4800532	44947	578191	92287	2914096
146	National Bank of Bahrain	2009	4962234	44947	642021	113830	3062234
147	National Bank of Bahrain	2010	5319947	42819	699468	114362	2528723
148	National Bank of Bahrain	2011	5593351	41755	730585	121277	2585372
149	TAIB Bank B.S.C.	2006	254500	3600	147900	15600	54300

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
150	TAIB Bank B.S.C.	2007	259500	6800	145500	10100	50700
151	TAIB Bank B.S.C.	2008	259900	10800	121100	-10600	52100
152	TAIB Bank B.S.C.	2009	185200	13700	125300	1800	24200
153	TAIB Bank B.S.C.	2010	202300	13200	143600	8500	22800
154	TAIB Bank B.S.C.	2011	260200	14800	149500	18700	14500
155	TAIB Bank B.S.C.	2012	229200	16700	169600	22400	11500
156	TAIB Bank B.S.C.	2013	224500	21200	214000	16900	19700
157	TAIB Bank B.S.C.	2014	207600	22500	133000	-65300	28400
158	TAIB Bank B.S.C.	2015	218400	21400	104100	-26100	25200
159	TAIB Bank B.S.C.	2016	175300	14800	58400	-39000	16200
160	TAIB Bank B.S.C.	2017	133300	13800	45800	-9000	15900
161	United Gulf Bank (BSC) EC	2000	385500	43500	203400	18000	54800
162	United Gulf Bank (BSC) EC	2001	443300	3800	214100	4200	78800
163	United Gulf Bank (BSC) EC	2002	495500	4100	225800	11500	121000
164	United Gulf Bank (BSC) EC	2003	647500	4800	315700	43300	76900
165	United Gulf Bank (BSC) EC	2004	768100	5800	330500	52400	163100
166	United Gulf Bank (BSC) EC	2005	737000	5500	472100	107600	178800
167	United Gulf Bank (BSC) EC	2006	1115100	7000	592900	120000	308200
168	United Gulf Bank (BSC) EC	2007	1024800	11600	804700	268300	291900
169	United Gulf Bank (BSC) EC	2008	558800	1900	815300	214600	7800
170	United Gulf Bank (BSC) EC	2009	685500	1000	572300	23800	52600
171	United Gulf Bank (BSC) EC	2010	575200	1100	600800	42400	57900
172	United Gulf Bank (BSC) EC	2011	292100	900	603200	-3000	28000
173	Bank Maskan	2006	15893402	721451	908541	365901	12984087
174	Bank Maskan	2007	16148941	753004	1098621	316867	14022909
175	Bank Maskan	2008	16695184	766833	1133845	217132	15826308
176	Bank Maskan	2009	21237454	880055	1132986	126007	20279657
177	Bank Maskan	2010	34022934	935928	1241340	176671	36543045
178	Bank Mellat	2002	11957172	235965	511983	57373	7652236
179	Bank Mellat	2003	16572265	253095	533387	62991	12468575
180	Bank Mellat	2004	15511670	1480534	553802	121066	11301532
181	Bank Mellat	2005	19067068	1437570	1739890	112731	13988232
182	Bank Mellat	2006	25602867	1418706	1943717	125857	18354322
183	Bank Mellat	2007	33559935	1458294	2014151	216337	24759272
184	Bank Mellat	2008	33990559	1285379	1797304	278154	24121242
185	Bank Mellat	2009	44097529	1397920	1977166	366650	28016599
186	Bank Mellat	2010	51185840	1544025	2183130	630458	35313808
187	Bank Saderat Iran	2000	14960205	1004896	512530	317512	18672318
188	Bank Saderat Iran	2001	3227837	275607	1113532	43290	4750436
189	Bank Saderat Iran	2002	6338605	469875	318557	244988	7865326
190	Bank Saderat Iran	2003	7598140	467477	983160	393184	8937520
191	Bank Saderat Iran	2004	9048496	568435	1224288	500687	10355638
192	Bank Saderat Iran	2005	8227715	2169091	1729819	453243	16080171

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
193	Bank Saderat Iran	2006	26765120	2051174	3325714	269393	20502002
194	Bank Saderat Iran	2007	33307283	2424239	3278048	165761	25365218
195	Bank Saderat Iran	2008	31767634	2106610	3280544	250403	24527409
196	Bank Saderat Iran	2009	40103999	2181900	2784764	245400	29440299
197	Bank Saderat Iran	2010	44457106	2233819	2705000	707679	31623612
198	Bank Sarmaye	2006	188370	24922	436524	49188	131145
199	Bank Sarmaye	2007	797158	52538	432714	50875	797717
200	Bank Sarmaye	2008	1580947	85845	447188	55742	1555563
201	Bank Sarmaye	2009	2411947	66864	420362	66833	2056993
202	Bank Sarmaye	2010	2969926	67664	445834	85206	2557106
203	Bank Sepah	2000	17003240	664806	235839	29386	10101942
204	Bank Sepah	2001	4585052	159512	633095	21450	2791697
205	Bank Sepah	2002	6392660	163255	155579	78341	4416315
206	Bank Sepah	2003	7427528	152781	391397	67587	6418458
207	Bank Sepah	2004	8758037	921550	518294	220097	6812087
208	Bank Sepah	2005	11117872	916461	1641151	2395	8549142
209	Bank Sepah	2006	17643049	946132	1527879	21681	14175755
210	Bank Sepah	2007	21112691	964113	1542529	12056	17841349
211	Bank Sepah	2008	18445184	924698	1519813	9069	15060157
212	Bank Sepah	2009	18468570	925140	1435651	9260	14887500
213	Bank Sepah	2010	20977882	958895	1293670	28322	16460810
214	Bank Tejarat	2000	11081817	615231	365921	44570	8358908
215	Bank Tejarat	2001	19148557	738440	398673	149084	7470118
216	Bank Tejarat	2002	5711387	186431	750750	55275	2404860
217	Bank Tejarat	2003	8374489	206827	166783	59539	5611277
218	Bank Tejarat	2004	9758136	230020	280650	77663	6823074
219	Bank Tejarat	2005	12018463	1293094	408693	224727	11410183
220	Bank Tejarat	2006	14441879	1277754	1749769	104933	14035798
221	Bank Tejarat	2007	17764698	1358011	1702898	119788	13380007
222	Bank Tejarat	2008	22473228	1285477	1406675	336759	17516839
223	Bank Tejarat	2009	25920617	1239339	1841575	282185	18622421
224	Bank Tejarat	2010	29190159	1187250	1941687	335370	2207800
225	Karafarin Bank	2006	200761	54091	223841	78092	1763098
226	Karafarin Bank	2007	2538087	66478	203761	80418	1893219
227	Karafarin Bank	2008	3137797	59579	223491	117379	2232783
228	Karafarin Bank	2009	3241102	87552	356927	166024	2261721
229	Karafarin Bank	2010	3270621	81683	415116	188123	2604034
230	Parsian Bank	2000	3630	1336	38951	2205	189
231	Parsian Bank	2001	118682	8553	41009	7910	74851
232	Parsian Bank	2002	775997	16004	44165	21001	617995
233	Parsian Bank	2003	2971274	50355	50004	127633	2394165
234	Parsian Bank	2004	7207153	142623	263603	198950	5629443
235	Parsian Bank	2005	10909878	185762	633490	216164	7811966

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
236	Parsian Bank	2006	15311840	279703	834361	352736	10607197
237	Parsian Bank	2007	17234714	304746	1118994	334966	11868793
238	Parsian Bank	2008	19252370	306050	1299587	392180	14930690
239	Parsian Bank	2009	22394045	443575	1521440	527633	17944390
240	Al-Bilad Islamic Bank for Investments & Financing	2007	94778	2086	23937	4363	673
241	Al-Bilad Islamic Bank for Investments & Financing	2008	306273	23915	48070	4697	3187
242	Al-Bilad Islamic Bank for Investments & Financing	2009	387964	119994	99284	8236	31942
243	Al-Bilad Islamic Bank for Investments & Financing	2010	233324	145207	103522	3373	66000
244	Al-Bilad Islamic Bank for Investments & Financing	2011	206025	150976	147286	9577	45927
245	Bank of Baghdad	2005	165519	2858	37607	1236	42395
246	Bank of Baghdad	2006	182881	3320	44898	2692	32676
247	Bank of Baghdad	2007	210267	9076	62640	13677	43345
248	Bank of Baghdad	2008	344861	10121	79643	18728	38887
249	Bank of Baghdad	2009	565486	12401	93307	15912	66344
250	Bank of Baghdad	2010	687768	25859	101528	13856	154514
251	Bank of Baghdad	2011	597751	29071	119333	21344	124494
252	Dijlah & Furat Bank for Development and Investment Joint Stock Company	2006	5117	5876	18868	-1761	700
253	Dijlah & Furat Bank for Development and Investment Joint Stock Company	2007	14569	5525	20854	556	2821
254	Dijlah & Furat Bank for Development and Investment Joint Stock Company	2008	54601	7290	42748	1692	4481
255	Dijlah & Furat Bank for Development and Investment Joint Stock Company	2009	76340	12917	47312	5208	8108
256	Dijlah & Furat Bank for Development and Investment Joint Stock Company	2010	59369	17732	46081	3751	20282
257	Dijlah & Furat Bank for Development and Investment Joint Stock Company	2011	150522	19887	49009	5345	88528
258	Investment Bank of Iraq SA Co	2005	57937	2820	20637	5003	36034
259	Investment Bank of Iraq SA Co	2006	90205	4063	23535	6318	34360
260	Investment Bank of Iraq SA Co	2007	62746	3721	32058	9452	20055
261	Investment Bank of Iraq SA Co	2008	85175	5347	40141	12362	11148

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
262	Investment Bank of Iraq SA Co	2009	101561	6741	53450	4762	21748
263	Investment Bank of Iraq SA Co	2010	118816	5511	75603	7607	64779
264	Investment Bank of Iraq SA Co	2011	160021	10411	100092	8477	105716
265	Kurdistan International Bank for Investment and Development	2005	56201	8077	45713	5014	108
266	Kurdistan International Bank for Investment and Development	2006	149481	10931	56827	11356	173
267	Kurdistan International Bank for Investment and Development	2007	216849	5200	66610	13306	270
268	Kurdistan International Bank for Investment and Development	2008	277193	17845	112808	9138	2046
269	Kurdistan International Bank for Investment and Development	2009	297103	17391	176084	24165	607
270	National Bank of Iraq	2007	23981	871	21870	2561	6093
271	National Bank of Iraq	2008	29492	1883	26527	3268	8070
272	National Bank of Iraq	2009	32340	2573	40566	-3314	11324
273	National Bank of Iraq	2010	37997	3272	42097	1493	30551
274	National Bank of Iraq	2011	51244	3270	86883	1889	41521
275	North Bank	2005	24189	573	7458	1033	7456
276	North Bank	2006	37258	6258	20321	959	21874
277	North Bank	2007	113398	4595	96124	12183	68466
278	North Bank	2008	190543	5911	100530	12262	53795
279	North Bank	2009	247972	19575	108278	15227	90834
280	North Bank	2010	404974	33721	129700	21329	180499
281	North Bank	2011	387077	101851	186111	30452	215787
282	Trade Bank of Iraq	2005	299100	3600	135900	34400	346800
283	Trade Bank of Iraq	2006	2244400	9600	235900	100000	535300
284	Trade Bank of Iraq	2007	5259100	7100	490800	254800	912500
285	Trade Bank of Iraq	2008	8765800	6800	846500	355700	1341000
286	Trade Bank of Iraq	2009	11668300	8800	1151500	305000	2392900
287	Trade Bank of Iraq	2010	13321300	26400	1512100	360600	2122600
288	United Bank for Investment	2007	34002	1094	18506	-984	670
289	United Bank for Investment	2008	29004	1833	20176	-607	710
290	United Bank for Investment	2009	208324	5706	96306	14180	93635
291	United Bank for Investment	2010	244920	8844	157254	34361	223864
292	United Bank for Investment	2011	255879	11756	211492	42059	239328
293	Ahli United Bank KSC	2000	2799345	40262	461211	50409	1144681
294	Ahli United Bank KSC	2001	2946202	39126	482556	51516	1385719
295	Ahli United Bank KSC	2002	4148549	33731	506963	37738	1959056
296	Ahli United Bank KSC	2003	4234136	24432	610112	67866	2228707
297	Ahli United Bank KSC	2004	4958602	21378	720733	93655	2790295
298	Ahli United Bank KSC	2005	4439726	57534	775685	154110	2595206

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
299	Ahli United Bank KSC	2006	5536072	69862	888497	170851	3192225
300	Ahli United Bank KSC	2007	6917216	130037	1110989	203297	4584249
301	Ahli United Bank KSC	2008	6942562	180467	985323	193876	5337561
302	Ahli United Bank KSC	2009	7652174	171418	945474	81967	5737705
303	Ahli United Bank KSC	2010	8298636	153266	987078	91529	5806533
304	Al Ahli Bank of Kuwait (KSC)	2005	7032925	49457	910286	207512	4959189
305	Al Ahli Bank of Kuwait (KSC)	2006	9398535	51282	1168864	278388	6849817
306	Al Ahli Bank of Kuwait (KSC)	2007	9568038	122486	1132089	166334	7715528
307	Al Ahli Bank of Kuwait (KSC)	2008	8988842	110879	1152371	136332	7056137
308	Al Ahli Bank of Kuwait (KSC)	2009	8622238	105132	1669993	189594	7148254
309	Al Ahli Bank of Kuwait (KSC)	2010	9064968	103733	1762024	180546	7417086
310	Boubyan Bank KSC	2005	682877	7534	366096	23630	50685
311	Boubyan Bank KSC	2006	1299716	12451	416407	35623	236564
312	Boubyan Bank KSC	2007	2179121	16117	510989	68132	729304
313	Boubyan Bank KSC	2008	2492480	17757	498279	6885	1722776
314	Boubyan Bank KSC	2009	3018480	14993	310669	-181311	2010460
315	Boubyan Bank KSC	2010	3784391	16750	855666	21383	2938703
316	Boubyan Bank KSC	2011	4599426	22254	887294	28356	3697416
317	Burgan Bank SAK	2007	8720147	65201	1286081	273993	5205495
318	Burgan Bank SAK	2008	11638340	110890	1398079	129371	7729661
319	Burgan Bank SAK	2009	11864714	127964	1520572	71827	7834379
320	Burgan Bank SAK	2010	12032787	176051	1919458	55239	7611547
321	Burgan Bank SAK	2011	13416727	176597	2030510	206748	8084350
322	Commercial Bank of Kuwait SAK	2000	3821604	71686	597381	98200	2376759
323	Commercial Bank of Kuwait SAK	2001	4284969	50864	654059	114118	2860450
324	Commercial Bank of Kuwait SAK	2002	4207661	58110	705006	129914	3225462
325	Commercial Bank of Kuwait SAK	2003	4762131	53614	1005090	191720	3409569
326	Commercial Bank of Kuwait SAK	2004	4361384	57686	960638	211401	3338310
327	Commercial Bank of Kuwait SAK	2005	5931849	76027	1288014	278082	4017466
328	Commercial Bank of Kuwait SAK	2006	8021028	83005	1675659	345853	5219271
329	Commercial Bank of Kuwait SAK	2007	13352747	101099	1930403	441026	8110623
330	Commercial Bank of Kuwait SAK	2008	13362928	111614	1802500	364921	8807393
331	Commercial Bank of Kuwait SAK	2009	10759763	91353	1536960	697	8392259
332	Commercial Bank of Kuwait SAK	2010	10972916	88026	1732359	144334	8369209
333	Commercial Bank of Kuwait SAK	2011	11272075	94042	1907394	3230	7756640
334	Gulf Bank KSC (The)	2000	4625859	32406	592799	116203	2455646
335	Gulf Bank KSC (The)	2001	5254320	32931	665471	137268	2960548

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
336	Gulf Bank KSC (The)	2002	5710851	33063	740741	152289	3120262
337	Gulf Bank KSC (The)	2003	7105192	38683	887682	164574	4111978
338	Gulf Bank KSC (The)	2004	6189684	41398	896844	253478	4541228
339	Gulf Bank KSC (The)	2005	7193836	47603	1039726	292466	5406164
340	Gulf Bank KSC (The)	2006	11898388	66750	1379954	366259	8778792
341	Gulf Bank KSC (The)	2007	15997802	85348	1797436	477656	11973626
342	Gulf Bank KSC (The)	2008	16871897	85885	137706	-1302772	12495742
343	Gulf Bank KSC (The)	2009	14498954	86820	1421897	-97978	11387029
344	Gulf Bank KSC (The)	2010	14343194	91946	1463649	68068	11337848
345	Gulf Bank KSC (The)	2011	15015793	92965	1544508	109835	11967337
346	Kuwait Finance House	2000	5089034	89689	679869	160065	3766285
347	Kuwait Finance House	2001	6055103	95533	836322	174764	4015977
348	Kuwait Finance House	2002	6644291	82824	937782	188692	4652173
349	Kuwait Finance House	2003	8021377	133695	1035629	206311	5889040
350	Kuwait Finance House	2004	9110960	244995	1286732	262301	6754326
351	Kuwait Finance House	2005	11886644	368836	2582534	442123	9272603
352	Kuwait Finance House	2006	16223628	1386871	3165594	668188	11849277
353	Kuwait Finance House	2007	23574359	1492674	5475458	1191941	18016850
354	Kuwait Finance House	2008	29299873	2142779	5793441	632723	21604276
355	Kuwait Finance House	2009	29724547	2097629	5368898	250349	22240237
356	Kuwait Finance House	2010	33935853	2675339	5594441	255880	24300072
357	Kuwait Finance House	2011	37024767	2753051	5273510	133166	26156856
358	Kuwait International Bank	2000	1341735	44517	276923	14075	1192471
359	Kuwait International Bank	2001	1405608	43365	307793	30975	1318878
360	Kuwait International Bank	2002	1409010	42414	344321	36402	1344221
361	Kuwait International Bank	2003	1633186	41059	402443	60400	1491686
362	Kuwait International Bank	2004	1771293	40719	554123	76349	1525280
363	Kuwait International Bank	2005	1942466	43151	548288	33219	1668151
364	Kuwait International Bank	2006	2076849	48074	492841	32856	1671854
365	Kuwait International Bank	2007	2826007	56044	578388	65934	2101832
366	Kuwait International Bank	2008	3259286	53995	597210	71752	2608806
367	Kuwait International Bank	2009	3297768	95188	603905	-28591	2665272
368	Kuwait International Bank	2010	3296864	99073	698860	59872	2545617
369	Kuwait International Bank	2011	3189878	92965	745154	38765	2485284
370	National Bank of Kuwait S.A.K.	2000	11458265	136498	1360065	328969	4579051
371	National Bank of Kuwait S.A.K.	2001	12503750	129442	1423215	342354	5097163
372	National Bank of Kuwait S.A.K.	2002	15039909	130915	1791404	354674	7155596
373	National Bank of Kuwait S.A.K.	2003	15636919	134374	1961317	411605	8451306
374	National Bank of Kuwait S.A.K.	2004	15822192	138785	2225653	510010	9313539
375	National Bank of Kuwait S.A.K.	2005	18110959	270548	2653767	705479	11519521
376	Bank Dhofar SAOG	2000	581014	9363	103511	14304	553446

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
377	Bank Dhofar SAOG	2001	737061	13004	110793	15865	670221
378	Bank Dhofar SAOG	2002	738882	12224	123277	21586	691808
379	Bank Dhofar SAOG	2003	1001040	8843	164369	26528	955007
380	Bank Dhofar SAOG	2004	1184655	9103	176073	28869	1057217
381	Bank Dhofar SAOG	2005	1332120	9883	206762	36931	1224707
382	Bank Dhofar SAOG	2006	1302211	10923	242653	52276	1427308
383	Bank Dhofar SAOG	2007	1822107	11443	287386	59298	1832510
384	Bank Dhofar SAOG	2008	2584915	11964	489987	61638	2648895
385	Bank Dhofar SAOG	2009	3049415	13004	530559	66060	3105852
386	Bank Dhofar SAOG	2010	3473082	22887	589077	86606	3281404
387	Bank Dhofar SAOG	2011	4104811	22107	596099	36151	3889727
388	Bank Muscat SAOG	2000	2927178	20546	259038	42393	2591938
389	Bank Muscat SAOG	2001	2901430	19506	317815	20286	2855917
390	Bank Muscat SAOG	2002	3350585	25488	360728	59558	3188036
391	Bank Muscat SAOG	2003	3287126	31209	399740	70481	3054616
392	Bank Muscat SAOG	2004	3474642	30949	505332	88687	3457477
393	Bank Muscat SAOG	2005	3610143	27568	744083	118075	3568010
394	Bank Muscat SAOG	2006	5750325	29649	832510	157087	4771652
395	Bank Muscat SAOG	2007	7801300	49675	1632250	219246	6987776
396	Bank Muscat SAOG	2008	12086606	57217	1859038	243953	9694929
397	Bank Muscat SAOG	2009	11972172	68401	1849935	191678	9982315
398	Bank Muscat SAOG	2010	11551365	194538	2071261	264239	10423667
399	Bank Muscat SAOG	2011	14515995	186736	2264239	305592	12534200
400	Bank Sohar SAOG	2007	943043	11964	128218	-6502	777373
401	Bank Sohar SAOG	2008	1894148	35631	250975	-5982	1649675
402	Bank Sohar SAOG	2009	2322237	37191	274122	20806	2046034
403	Bank Sohar SAOG	2010	2750065	35891	321196	26528	2333680
404	Bank Sohar SAOG	2011	3158648	36931	334720	37711	2573472
405	HSBC Bank Oman	2000	1502731	35631	220286	25748	1330299
406	HSBC Bank Oman	2001	1356567	30429	220546	5202	1187516
407	HSBC Bank Oman	2002	1240572	26008	234330	48114	1050455
408	HSBC Bank Oman	2003	1292328	22887	269181	34330	1009103
409	HSBC Bank Oman	2004	1510013	23147	271521	34590	1182835
410	HSBC Bank Oman	2005	1803641	23147	297009	57217	1333160
411	HSBC Bank Oman	2006	1884265	23407	325878	68140	1344343
412	HSBC Bank Oman	2007	2175813	80364	421586	73082	1456177
413	HSBC Bank Oman	2008	2014304	78023	448895	76723	1630169
414	HSBC Bank Oman	2009	1964889	78283	444994	55917	1598700
415	HSBC Bank Oman	2010	2140702	79844	439792	45774	1662159
416	HSBC Bank Oman	2011	2655137	95969	448375	42913	1785696
417	National Bank of Oman (SAOG)	2000	1667880	23407	291287	21586	1670741
418	National Bank of Oman (SAOG)	2001	2082705	23667	249935	-19506	1871261
419	National Bank of Oman	2002	2006502	23147	249415	-780	1776333

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
	(SAOG)						
420	National Bank of Oman (SAOG)	2003	1776073	19246	253056	-134720	1374252
421	National Bank of Oman (SAOG)	2004	1500650	17685	266580	13524	1346684
422	National Bank of Oman (SAOG)	2005	1632250	17425	436931	52796	1408323
423	National Bank of Oman	2006	2168791	15345	480104	79064	1830429
424	National Bank of Oman (SAOG)	2007	2994798	17685	605462	115995	2358388
425	National Bank of Oman (SAOG)	2008	4209103	24967	638231	118075	3644213
426	National Bank of Oman (SAOG)	2009	3850195	33290	651235	54876	3539662
427	National Bank of Oman (SAOG)	2010	3789857	58257	691287	70741	3545384
428	National Bank of Oman (SAOG)	2011	4741482	53316	731339	88947	4345384
429	Oman Arab Bank SAOG	2000	594278	10403	99870	17685	591417
430	Oman Arab Bank SAOG	2001	705592	9623	101951	15865	600000
431	Oman Arab Bank SAOG	2002	807022	10403	107152	19766	627828
432	Oman Arab Bank SAOG	2003	809363	9883	117815	21847	644213
433	Oman Arab Bank SAOG	2004	780494	10663	144603	27048	670221
434	Oman Arab Bank SAOG	2005	885306	11704	162029	35631	701691
435	Oman Arab Bank SAOG	2006	1140962	11704	190637	39272	862679
436	Oman Arab Bank SAOG	2007	1401821	19506	229649	50715	1011443
437	Oman Arab Bank SAOG	2008	1646554	21326	287386	63979	1401821
438	Oman Arab Bank SAOG	2009	1815345	24447	328999	60078	1471001
439	Oman Arab Bank SAOG	2010	2017165	32510	371391	60338	1717555
440	Oman Arab Bank SAOG	2011	2385696	39012	418726	60338	2158127
441	Ahli Bank QSC	2000	574918	7802	83324	19945	345192
442	Ahli Bank QSC	2001	910357	7500	224698	23654	396923
443	Ahli Bank QSC	2002	1365879	20604	295385	38901	958819
444	Ahli Bank QSC	2003	2245769	31951	324863	55549	1729231
445	Ahli Bank QSC	2004	3694863	34121	418626	85192	2776319
446	Ahli Bank QSC	2005	4286044	38187	450659	116978	3172280
447	Ahli Bank QSC	2006	4395302	35302	536429	82555	3408517
448	Ahli Bank QSC	2007	4218489	50247	567115	113269	3115083
449	Ahli Bank QSC	2008	4058434	49918	690385	121484	3339231
450	Al Khalij Commercial Bank	2007	1387542	27054	983567	15832	1397580
451	Al Khalij Commercial Bank	2008	1952830	40302	1248901	28462	1917583
452	Al Khalij Commercial Bank	2009	3400083	35989	1327830	45962	2358626
453	Al Khalij Commercial Bank	2010	4066236	31786	1443791	117225	1993599
454	Al Khalij Commercial Bank	2011	5749918	26429	1484176	133791	3108214
455	Commercial Bank of Qatar QSC	2000	1064835	19423	143324	15440	667418
456	Commercial Bank of Qatar QSC	2001	1102308	20357	168269	27775	749945
457	Commercial Bank of Qatar QSC	2002	1313984	25604	199808	43626	946291

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
458	Commercial Bank of Qatar QSC	2003	1841511	42418	387692	67198	1278791
459	Commercial Bank of Qatar QSC	2004	2488105	88901	719753	95000	1844423
460	Commercial Bank of Qatar QSC	2005	4105083	87335	1559643	205907	2990138
461	Commercial Bank of Qatar QSC	2006	5467967	153352	1547088	237006	4769149
462	Commercial Bank of Qatar QSC	2007	8435165	198187	1710934	382060	6874039
463	Commercial Bank of Qatar QSC	2008	12057665	312115	2741319	467692	9312500
464	Commercial Bank of Qatar QSC	2009	9349121	282857	3299506	418571	8771786
465	Commercial Bank of Qatar QSC	2010	10368517	293681	3434039	449258	9221621
466	Commercial Bank of Qatar QSC	2011	12356429	294038	3909423	517582	11432363
467	Doha Bank	2000	1326017	16181	127967	17830	772060
468	Doha Bank	2001	1562967	25357	172363	19423	908022
469	Doha Bank	2002	1771813	23187	214753	33242	1136374
470	Doha Bank	2003	2140330	25357	307692	58874	1326154
471	Doha Bank	2004	2523077	26374	424615	101236	1480302
472	Doha Bank	2005	3415605	32060	659560	216978	2278764
473	Doha Bank	2006	4709094	49780	760440	204396	3744533
474	Doha Bank	2007	6707198	82088	994203	254533	5258242
475	Doha Bank	2008	8627693	136154	1349670	260027	6575055
476	Doha Bank	2009	10543737	156731	1607363	267473	7114259
477	Doha Bank	2010	10853132	202610	1657830	289615	7293105
478	Doha Bank	2011	11905028	225522	1945385	340989	8435165
479	International Bank of Qatar	2001	251731	852	29780	9176	125275
480	International Bank of Qatar	2002	267582	495	39560	9863	163571
481	International Bank of Qatar	2003	310797	2280	41181	8819	191868
482	International Bank of Qatar	2004	436621	1731	107582	10220	277143
483	International Bank of Qatar	2005	1015687	14890	247885	24725	617088
484	International Bank of Qatar	2006	1445824	18269	349478	41593	1031319
485	International Bank of Qatar	2007	2396539	25742	480137	64368	1790330
486	International Bank of Qatar	2008	5384259	37885	712445	83819	3620083
487	International Bank of Qatar	2009	5478242	42802	761566	94011	3565220
488	International Bank of Qatar	2010	5756209	48407	801181	125852	4214918
489	International Bank of Qatar	2011	6250687	45357	1139368	157308	4595879
490	Masraf Al Rayan (Q.S.C.)	2007	111484	13846	1211181	327610	1851044
491	Masraf Al Rayan (Q.S.C.)	2008	113654	23434	1394396	251923	3660934
492	Masraf Al Rayan (Q.S.C.)	2009	403874	22720	1637857	241951	4876484
493	Masraf Al Rayan (Q.S.C.)	2010	355055	23901	1957912	332775	6885687
494	Masraf Al Rayan (Q.S.C.)	2011	1145989	19368	2336319	386923	9551044
495	Qatar International Islamic Bank	2000	471099	3929	45385	9341	505714
497	Qatar International Islamic Bank	2002	747885	11181	63626	13901	402857

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
498	Qatar International Islamic Bank	2003	954670	10934	82500	17692	561841
499	Qatar International Islamic Bank	2004	1209560	10907	123489	24423	718956
500	Qatar International Islamic Bank	2005	1424561	9945	242390	127912	932473
501	Qatar International Islamic Bank	2006	474615	9423	391538	109615	994423
502	Qatar International Islamic Bank	2007	1997912	9451	647363	131868	1205659
503	Qatar International Islamic	2008	2517665	64615	763819	138379	2267253
504	Qatar International Islamic Bank	2009	3180028	60412	1043764	140467	2784725
505	Qatar International Islamic Bank	2010	3882967	59368	1048709	153516	2521346
506	Qatar International Islamic Bank	2011	4974396	50962	1344286	179396	2909066
507	Qatar Islamic Bank SAQ	2000	913819	15659	86264	11319	940385
508	Qatar Islamic Bank SAQ	2001	1005385	16703	89890	18956	974286
509	Qatar Islamic Bank SAQ	2002	1135714	13901	112445	28571	685824
510	Qatar Islamic Bank SAQ	2003	1313517	17995	154121	41731	906813
511	Qatar Islamic Bank SAQ	2004	1603654	18049	418929	83324	1171236
512	Qatar Islamic Bank SAQ	2005	1893462	16731	591429	149808	1640907
513	Qatar Islamic Bank SAQ	2006	2714286	29643	1190714	282885	1965934
514	Qatar Islamic Bank SAQ	2007	4342088	27967	1304148	363407	3208544
515	Qatar Islamic Bank SAQ	2008	6947390	71511	2024423	468297	5182940
516	Qatar Islamic Bank SAQ	2009	7981319	82170	2527143	355687	6226237
517	Qatar Islamic Bank SAQ	2010	10616154	101813	2558159	346758	8063682
518	Qatar Islamic Bank SAQ	2011	11263654	110495	3530330	334011	8130742
519	Qatar National Bank	2000	5444533	23077	1091017	134890	3761127
520	Qatar National Bank	2001	6417198	23599	1181071	144863	5205852
521	Qatar National Bank	2002	7038764	23736	1240028	159368	5481621
522	Qatar National Bank	2003	7622116	38297	1390824	176126	6357500
523	Qatar National Bank	2004	8727281	145165	1836291	227335	7305220
524	Qatar National Bank	2005	10798023	128407	2392583	422198	8647665
525	Qatar National Bank	2006	17038929	161841	2323434	548874	12699616
526	Qatar National Bank	2007	25216320	178984	3807253	688489	18149479
527	Qatar National Bank	2008	34681678	169835	4572335	1003434	27487227
528	Qatar National Bank	2009	40865964	195879	5486759	1150687	29885523
529	Qatar National Bank	2010	49399728	251346	6811182	1566539	36180222
530	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2004	17256289	253752	2719626	783952	17200588
531	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2005	20249693	364272	3596609	1504219	21338772
532	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2006	21189747	527797	5388385	1949773	18705261
533	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2007	25460427	691883	6303365	1722216	23079920

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
534	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2008	33771388	764827	7208480	1739893	28787388
535	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2009	34390402	848560	7664240	1804587	29906055
536	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2010	39594189	905307	8084747	1805600	32092722
537	Al Rajhi Banking & Investment Corporation-Al Rajhi Bank	2011	48120083	966267	8752294	1967547	37438829
538	Alinma Bank	2007	34985	98463	3095136	85357	201845
539	Alinma Bank	2008	44373	128533	4104000	104027	234980
540	Alinma Bank	2009	399333	245920	4161414	161413	296480
541	Alinma Bank	2010	2818640	318187	4165467	4053	4158214
542	Alinma Bank	2011	5391787	367787	4238427	115013	6735600
543	Arab Investment Company SAA	2003	1682100	21500	511500	38100	935500
544	Arab Investment Company SAA	2004	1932700	20400	592700	55900	1110500
545	Arab Investment Company SAA	2005	2322800	19400	684000	73400	1256500
546	Arab Investment Company SAA	2006	2625400	18600	744400	82400	1561200
547	Arab Investment Company SAA	2007	3449400	18400	847800	93400	1681700
548	Arab Investment Company SAA	2008	2824900	18500	751200	42400	1257700
549	Arab Investment Company SAA	2009	1688000	13700	869200	54000	783100
550	Arab Investment Company SAA	2010	1269500	14200	919600	52900	551300
551	Arab Investment Company SAA	2011	1184600	14400	895400	26200	643900
552	Arab National Bank	2000	8715594	143685	926756	108144	3715648
553	Arab National Bank	2001	9155167	142697	978611	129826	3702777
554	Arab National Bank	2002	10202136	117971	1042750	155941	4276555
555	Arab National Bank	2003	11437009	86275	1173004	204673	4618158
556	Arab National Bank	2004	14989720	102109	1327023	311562	7625608
557	Arab National Bank	2005	15276208	111642	1692016	488011	10354766
558	Arab National Bank	2006	17322350	156555	2130868	668812	13283632
559	Arab National Bank	2007	20864993	206595	2810307	657196	16320908
560	Arab National Bank	2008	27534001	249307	3379014	662960	19909761
561	Arab National Bank	2009	24371841	330587	3860880	631200	17816268
562	Arab National Bank	2010	25678801	336213	4105760	508667	17654108
563	Arab National Bank	2011	25782215	342293	4461200	578853	19425014
564	Arab Petroleum Investments Corporation - APICORP	2003	874400	45100	706900	33500	1149400
565	Arab Petroleum Investments Corporation - APICORP	2004	858700	42700	744400	38900	1149400
566	Arab Petroleum Investments Corporation - APICORP	2005	982400	40500	848500	94600	1141400

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
567	Arab Petroleum Investments Corporation - APICORP	2006	1160700	38300	896500	51000	1304600
568	Arab Petroleum Investments Corporation - APICORP	2007	1637600	36500	1020400	79700	1892500
569	Arab Petroleum Investments Corporation - APICORP	2008	1995500	34200	894800	27600	2371200
570	Arab Petroleum Investments Corporation - APICORP	2009	2443600	32100	1001700	58500	2621300
571	Arab Petroleum Investments Corporation - APICORP	2010	2205200	29300	1140900	95200	2541900
572	Arab Petroleum Investments Corporation - APICORP	2011	2818200	26800	1218800	105400	2803500
573	Bank AlBilad	2005	1045527	99786	774179	-26195	1391615
574	Bank AlBilad	2006	2098291	148278	807557	47557	2623445
575	Bank AlBilad	2007	3388304	158611	828865	19359	3631268
576	Bank AlBilad	2008	3316054	143307	856747	33360	2206960
577	Bank AlBilad	2009	3711707	105200	800587	-66240	2937093
578	Bank AlBilad	2010	4617280	91173	827467	24613	3277280
579	Bank AlBilad	2011	6255920	76373	911013	87893	3674587
580	Bank Al-Jazira	2000	1178131	54820	174927	13912	556903
581	Bank Al-Jazira	2001	1154312	52684	186782	15327	532924
582	Bank Al-Jazira	2002	1295247	39973	211535	15701	578692
583	Bank Al-Jazira	2003	2131162	54045	246275	24913	1244700
584	Bank Al-Jazira	2004	2397463	63738	426569	50307	1384967
585	Bank Al-Jazira	2005	2930120	108304	795113	234312	1845367
586	Bank Al-Jazira	2006	2961469	130788	1134873	526649	1674526
587	Bank Al-Jazira	2007	4369506	122644	1278798	214206	2637971
588	Bank Al-Jazira	2008	5937867	111387	1263413	59147	4035520
589	Bank Al-Jazira	2009	6622134	133627	1251840	7333	4134427
590	Bank Al-Jazira	2010	7395627	123333	1281520	7627	4987840
591	Bank Al-Jazira	2011	8657147	119147	1316507	80773	6215334
592	Banque Saudi Fransi	2000	8768011	122991	1056288	174179	4304566
593	Banque Saudi Fransi	2001	9102190	124059	1214660	225474	4480027
594	Banque Saudi Fransi	2002	10015728	121816	1371749	270814	5308037
595	Banque Saudi Fransi	2003	12365367	121175	1466649	316475	7136395
596	Banque Saudi Fransi	2004	13851909	120668	1621255	410120	9202510
597	Banque Saudi Fransi	2005	14963899	127076	1918531	591615	11476288
598	Banque Saudi Fransi	2006	17477811	147503	2511295	802911	13652924
599	Banque Saudi Fransi	2007	21930548	154152	3001495	723925	15981282
600	Banque Saudi Fransi	2008	26984855	157493	3751760	747707	21564428
601	Banque Saudi Fransi	2009	25618375	161653	4200480	658080	20884028
602	Banque Saudi Fransi	2010	25557921	156347	4806134	747013	21593761
603	Banque Saudi Fransi	2011	29873922	154933	5241414	776240	24620028
604	National Commercial Bank	2000	23928732	854152	1052817	366355	9771001

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
605	National Commercial Bank	2001	23700107	779306	1588865	512737	10122377
606	National Commercial Bank	2002	25253458	711722	2236662	649666	10743525
607	National Commercial Bank	2003	27437757	406142	3015140	804486	12306222
608	National Commercial Bank	2004	30100481	386782	3678104	942884	15922083
609	National Commercial Bank	2005	30924246	409853	5777410	1338051	20116502
610	National Commercial Bank	2006	33219306	421575	6408385	1675087	20626035
611	National Commercial Bank	2007	45744299	472150	7906435	1612150	23459012
612	National Commercial Bank	2008	49215469	559760	7342800	561893	28775682
613	National Commercial Bank	2009	58175310	574160	8229414	1099040	29908748
614	National Commercial Bank	2010	64931177	559200	8761787	1280907	33492562
615	National Commercial Bank	2011	69172564	617973	9489414	1628293	36077202
616	Riyad Bank	2000	14430013	332977	2485207	323578	5419680
617	Riyad Bank	2001	14729319	329559	2578772	361015	5657784
618	Riyad Bank	2002	14833618	357276	2469052	378211	6368358
619	Riyad Bank	2003	15966302	343338	2485501	425020	6986809
620	Riyad Bank	2004	16466329	333992	2629292	535541	9063738
621	Riyad Bank	2005	17541576	354793	2926676	757624	12177837
622	Riyad Bank	2006	20656475	441549	3202136	776662	13934099
623	Riyad Bank	2007	27270868	393111	3521175	804059	17981415
624	Riyad Bank	2008	33671655	434720	6850800	703680	25714641
625	Riyad Bank	2009	37717629	488053	7529440	808133	28403895
626	Riyad Bank	2010	37188215	496747	7795520	753227	28275948
627	Riyad Bank	2011	38950509	481813	8042240	839840	30126082
628	Saudi British Bank (The)	2000	10154312	133965	962483	198291	4065340
629	Saudi British Bank (The)	2001	9701469	137517	1056368	221682	4143712
630	Saudi British Bank (The)	2002	10590307	145447	1232443	259680	5351375
631	Saudi British Bank (The)	2003	10550120	146302	1389666	335888	6973725
632	Saudi British Bank (The)	2004	13439012	150895	1580080	439493	8445154
633	Saudi British Bank (The)	2005	14041015	140908	2000854	668705	10906969
634	Saudi British Bank (The)	2006	16403071	144513	2511242	811829	11335167
635	Saudi British Bank (The)	2007	21333218	147343	2783685	696128	16555648
636	Saudi British Bank (The)	2008	28999202	149733	3102347	778667	21396481
637	Saudi British Bank (The)	2009	27411361	158427	3478747	541947	20368428
638	Saudi British Bank (The)	2010	26489095	148960	4045840	502187	19799601
639	Saudi British Bank (The)	2011	29725495	143173	4577654	770240	22616348
640	Saudi Hollandi Bank	2000	5005100	61736	487023	107103	2676609
641	Saudi Hollandi Bank	2001	5878692	68198	548865	131776	3067530
642	Saudi Hollandi Bank	2002	6202136	68919	614953	148251	3243311
643	Saudi Hollandi Bank	2003	6373351	71215	731188	160454	3728118
644	Saudi Hollandi Bank	2004	7552684	77410	831535	198318	4441442
645	Saudi Hollandi Bank	2005	9175300	83658	980401	280881	6348865
646	Saudi Hollandi Bank	2006	10871055	82537	1136903	254419	7070734
647	Saudi Hollandi Bank	2007	11685608	85554	1214099	117116	7357704

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
648	Saudi Hollandi Bank	2008	13946294	124160	1524053	326320	10137894
649	Saudi Hollandi Bank	2009	13489041	132427	1502080	22933	9606134
650	Saudi Hollandi Bank	2010	11856187	132053	1703173	210773	9343734
651	Saudi Hollandi Bank	2011	12436134	130533	1975547	275173	10065414
652	Saudi Investment Bank (The)	2000	2855541	21896	527423	73885	2000721
653	Saudi Investment Bank (The)	2001	3341015	25634	583071	81202	2009907
654	Saudi Investment Bank (The)	2002	4536555	32043	632256	101575	2338718
655	Saudi Investment Bank	2003	4937223	26142	723178	123872	2688865
656	Saudi Investment Bank (The)	2004	6476903	38638	963124	156769	3479573
657	Saudi Investment Bank (The)	2005	8504326	54633	1417036	284166	5285367
658	Saudi Investment Bank (The)	2006	8645634	90868	1602483	535728	5525047
659	Saudi Investment Bank (The)	2007	9954686	113458	1807664	219546	6175888
660	Saudi Investment Bank (The)	2008	12242987	146027	1762293	141333	7881467
661	Saudi Investment Bank (The)	2009	11055841	188427	1980827	143653	7942587
662	Saudi Investment Bank (The)	2010	11229627	199440	2171040	117307	8267174
663	Saudi Investment Bank (The)	2011	10931894	241947	2281947	189813	7230427
664	Abu Dhabi Commercial Bank	2000	5426848	39809	958285	166290	4703063
665	Abu Dhabi Commercial Bank	2001	5679591	39646	1029489	167570	4453506
666	Abu Dhabi Commercial Bank	2002	5907039	39238	1186848	160735	4738053
667	Abu Dhabi Commercial Bank	2003	6189734	39483	1219769	110279	5247243
668	Abu Dhabi Commercial Bank	2004	8910878	54758	1350660	217999	7060939
669	Abu Dhabi Commercial Bank	2005	10888196	109762	2346739	523213	11481035
670	Abu Dhabi Commercial Bank	2006	14256038	139415	2920136	584670	16997849
671	Abu Dhabi Commercial Bank	2007	17576120	134105	3107338	567706	20606126
672	Abu Dhabi Commercial Bank	2008	26837740	156787	4333615	369911	29702137
673	Abu Dhabi Commercial Bank	2009	27198829	215575	5198148	-139632	31752266
674	Abu Dhabi Commercial Bank	2010	31978543	291436	5329694	106358	33430061
675	Abu Dhabi Commercial Bank	2011	33365990	262628	6011572	829163	33969966
676	Abu Dhabi Investment Company	2000	1428046	1906	250184	-38747	599210
677	Abu Dhabi Investment Company	2001	1232948	2941	223771	-18053	621947
678	Abu Dhabi Investment Company	2002	1220667	3186	227883	11191	629353
679	Abu Dhabi Investment Company	2003	1196760	2995	262954	12880	639782
680	Abu Dhabi Investment Company	2004	1276351	24044	330565	19278	601634

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
681	Abu Dhabi Investment Company	2005	1499959	79020	615221	70688	577590
682	Abu Dhabi Investment Company	2006	1276923	80463	524929	23254	562287
683	Abu Dhabi Investment Company	2007	1307883	99496	728114	51219	406426
684	Abu Dhabi Investment Company	2008	1202287	135085	391069	-87706	520817
685	Abu Dhabi Investment Company	2009	1556732	193710	468972	44221	459769
686	Abu Dhabi Investment Company	2010	2016801	207052	393628	-66658	428455
687	Abu Dhabi Investment Company	2011	1570511	304860	301321	-73901	365882
688	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2000	826385	8795	321361	16338	239047
689	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2001	1276270	7897	335140	21920	599483
690	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2002	1748727	7842	341184	20585	848114
691	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2003	2099006	9476	381321	27393	1644792
692	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2004	2996542	12063	409993	33465	2100885
693	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2005	5373206	29925	548700	93805	3637631
694	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2006	7942219	58080	754146	155752	5564792
695	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2007	9325664	89367	1476079	209394	6624152
696	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2008	11180939	87543	1534867	231749	9306603
697	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2009	13478067	103145	1945405	21266	11020803
698	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2010	15631994	159537	2208496	278693	13057209
699	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2011	15548863	265214	2333860	314527	13296474
700	Al Hilal Bank PJSC	2007	1006892	32876	198953	-78540	240807
701	Al Hilal Bank PJSC	2008	1262845	46562	223145	-49149	530701
702	Al Hilal Bank PJSC	2009	4071858	151232	501130	-19959	2788890
703	Al Hilal Bank PJSC	2010	6273492	154745	536174	35698	4168169
704	Al Hilal Bank PJSC	2011	6685800	332117	741620	49013	5262029
705	Amlak Finance PJSC	2004	265568	2015	219387	12988	405827
706	Amlak Finance PJSC	2005	536338	1879	486099	28863	836705
707	Amlak Finance PJSC	2006	683077	2478	481634	35507	1128523
708	Amlak Finance PJSC	2007	1433764	5092	542873	82478	1695684
709	Amlak Finance PJSC	2008	3116406	6399	561062	54432	2739469

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
710	Amlak Finance PJSC	2009	3056038	4929	579333	-42369	2457291
711	Amlak Finance PJSC	2010	2951096	2505	516433	-60749	2172335
712	Arab Bank for Investment & Foreign Trade-Al Masraf	2000	1130020	31641	339796	29326	336093
713	Arab Bank for Investment & Foreign Trade-Al Masraf	2001	1216583	30715	335793	10973	348918
714	Arab Bank for Investment & Foreign Trade-Al Masraf	2002	1196705	29027	343717	7924	387692
715	Arab Bank for Investment & Foreign Trade-Al Masraf	2003	937345	27828	340749	12553	424942
716	Arab Bank for Investment & Foreign Trade-Al Masraf	2004	1037604	28455	361906	20340	572553
717	Arab Bank for Investment & Foreign Trade-Al Masraf	2005	1139333	26385	383608	36079	616882
718	Arab Bank for Investment & Foreign Trade-Al Masraf	2006	1403812	49857	439700	57345	683785
719	Arab Bank for Investment & Foreign Trade-Al Masraf	2007	1929966	116515	718530	84792	1083240
720	Arab Bank for Investment & Foreign Trade-Al Masraf	2008	2648768	309952	746440	80463	1931436
721	Arab Bank for Investment & Foreign Trade-Al Masraf	2009	2253397	343445	810728	112784	1847733
722	Arab Bank for Investment & Foreign Trade-Al Masraf	2010	2652498	343581	862491	105405	1829244
723	Arab Bank for Investment & Foreign Trade-Al Masraf	2011	2541375	220422	755643	-92825	1659823
724	Bank of Sharjah	2000	404248	2532	93342	13152	298026
725	Bank of Sharjah	2001	409285	3431	98734	13669	280408
726	Bank of Sharjah	2002	484575	5609	106549	16093	361416
727	Bank of Sharjah	2003	550388	5255	242750	23799	420803
728	Bank of Sharjah	2004	641988	4765	279483	37304	550143
729	Bank of Sharjah	2005	1013451	4765	523268	164139	681361
730	Bank of Sharjah	2006	1322832	2478	570865	87161	1022900
731	Bank of Sharjah	2007	1816447	19877	626086	110007	1446453
732	Bank of Sharjah	2008	2866685	52607	1046399	111641	2815630
733	Bank of Sharjah	2009	3435480	56664	1115507	129476	3117903
734	Bank of Sharjah	2010	4030306	61892	1196705	109980	3296610
735	Bank of Sharjah	2011	4194908	62818	1143445	69108	3278230
736	Commercial Bank International	2000	548727	12172	90402	14976	469435
737	Commercial Bank International	2001	450919	9748	79864	13724	400381
738	Commercial Bank International	2002	673193	11491	104615	18026	572607
739	Commercial Bank International	2003	708591	11300	115262	11219	623581

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
740	Commercial Bank International	2004	809666	11219	134187	19632	698053
741	Commercial Bank International	2005	1107257	10647	183717	65269	807570
742	Commercial Bank International	2006	1582791	21021	303690	2369	1306658
743	Commercial Bank International	2007	2450592	26767	429735	87297	2166127
744	Commercial Bank International	2008	2483404	63799	441198	34663	2506712
745	Commercial Bank International	2009	2347611	60095	458516	14268	2125691
746	Commercial Bank International	2010	2629244	57236	455875	4520	2228455
747	Commercial Bank International	2011	2488741	49721	470334	17645	2141675
748	Commercial Bank of Dubai P.S.C.	2000	1566644	49639	308455	54840	1276896
749	Commercial Bank of Dubai P.S.C.	2001	1605882	55902	336447	58924	1237195
750	Commercial Bank of Dubai P.S.C.	2002	1713819	79728	401198	63553	1333016
751	Commercial Bank of Dubai P.S.C.	2003	1883485	89966	452090	74963	1568986
752	Commercial Bank of Dubai P.S.C.	2004	2278230	90238	563894	95602	2046589
753	Commercial Bank of Dubai P.S.C.	2005	3210402	94105	768223	149980	2543989
754	Commercial Bank of Dubai P.S.C.	2006	3837195	103962	1037468	163758	3442505
755	Commercial Bank of Dubai P.S.C.	2007	6649095	113165	1295820	254840	5657481
756	Commercial Bank of Dubai P.S.C.	2008	7655793	129558	1280653	210048	7781974
757	Commercial Bank of Dubai P.S.C.	2009	7312049	157086	1456773	218734	7726834
758	Commercial Bank of Dubai P.S.C.	2010	7536392	167869	1600817	223445	7396869
759	Commercial Bank of Dubai P.S.C.	2011	7326889	123159	1721334	223853	7301593
760	Emirates Investment Bank PJSC	2000	43540	109	17427	1416	2859
761	Emirates Investment Bank PJSC	2001	48196	82	25487	1470	2941
762	Emirates Investment Bank PJSC	2002	54976	82	26930	1661	3268
763	Emirates Investment Bank PJSC	2003	65024	136	40817	2015	5609
764	Emirates Investment Bank PJSC	2004	70252	136	65841	3104	5391
765	Emirates Investment Bank PJSC	2005	66576	136	106984	6617	2805
766	Emirates Investment Bank PJSC	2006	73029	82	61784	9803	10973
767	Emirates Investment Bank PJSC	2007	71069	27	92798	7216	6943
768	Emirates Investment Bank PJSC	2008	73302	762	26794	163	4792
769	Emirates Investment Bank PJSC	2009	141103	572	33928	2668	1988
770	Emirates Investment Bank PJSC	2010	232594	436	52008	5528	3213
771	Emirates Investment Bank PJSC	2011	335956	327	54758	6072	2451

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
772	Emirates Islamic Bank PJSC	2005	985024	5963	234118	26576	586903
773	Emirates Islamic Bank PJSC	2006	2478448	17563	263009	31995	1797359
774	Emirates Islamic Bank PJSC	2007	3830442	75425	361280	64942	2961661
775	Emirates Islamic Bank PJSC	2008	5904016	15412	455848	109081	4862001
776	Emirates Islamic Bank PJSC	2009	5616229	18489	782274	35480	4548890
777	Emirates Islamic Bank PJSC	2010	7606535	28455	797059	16147	3982491
778	Emirates Islamic Bank PJSC	2011	4686916	26930	674772	-122151	3531382
779	Emirates NBD PJSC	2006	19132144	119374	2417427	514173	17926889
780	Emirates NBD PJSC	2007	52509325	539877	6850592	754500	45316269
781	Emirates NBD PJSC	2008	58271231	760408	7014813	1002369	56890455
782	Emirates NBD PJSC	2009	58481415	626576	8705405	910143	58438202
783	Emirates NBD PJSC	2010	59828726	636324	9189816	636950	53667991
784	Emirates NBD PJSC	2011	60432702	701702	9525146	676242	55313900
785	First Gulf Bank	2000	489694	7869	128877	13669	382437
786	First Gulf Bank	2001	762805	17291	149626	16801	466903
787	First Gulf Bank	2002	1144044	30551	180014	21947	757223
788	First Gulf Bank	2003	1718012	35071	212335	32920	1376909
789	First Gulf Bank	2004	2786848	49884	483839	66685	1778679
790	First Gulf Bank	2005	4764057	59578	2134404	290592	3704234
791	First Gulf Bank	2006	14987692	415466	2755725	546821	12092389
792	First Gulf Bank	2007	22130755	547937	4525419	816120	21610075
793	First Gulf Bank	2008	24060585	173914	6236297	902110	24611545
794	First Gulf Bank	2009	27597603	170374	6706930	965092	26038938
795	First Gulf Bank	2010	32235561	168904	7288523	1009067	28514581
796	First Gulf Bank	2011	9457236	91028	2446698	418216	6851110
797	Invest Bank	2000	445275	3949	34979	2539	123836
798	Invest Bank	2001	538505	4090	35120	141	185331
799	Invest Bank	2002	443160	4513	43583	4983	143442
800	Invest Bank	2003	465585	4513	45416	5871	116361
801	Invest Bank	2004	490550	4654	54443	6770	129760
802	Invest Bank	2005	596051	7052	97602	38787	229055
803	Invest Bank	2006	707475	7616	104372	13822	312976
804	Invest Bank	2007	812298	11231	111189	8985	403762
805	Invest Bank	2008	776346	23829	120978	12549	427512
806	Invest Bank	2009	780563	23521	131268	10141	421972
807	Invest Bank	2010	763662	35352	151549	15352	493380
808	Invest Bank	2011	715493	37183	185775	13521	492958
809	Mashreqbank	2000	5239700	49530	958285	141675	3426004
810	Mashreqbank	2001	5731600	46698	1145323	174295	4013261
811	Mashreqbank	2002	6588836	47434	1430933	224752	4794064
812	Mashreqbank	2003	9123213	52771	2220504	547883	6063826
813	Mashreqbank	2004	11339469	82314	2164466	447297	8005773
814	Mashreqbank	2005	17340068	104479	2854840	578870	10439809

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
815	Mashreqbank	2006	18273002	129857	2908754	471641	14944479
816	Mashreqbank	2007	18314990	330865	3226004	289803	12996623
817	Mashreqbank	2008	16017644	374323	3372362	227801	11221484
818	Mashreqbank	2009	14515670	326154	3486426	234445	10263989
819	National Bank of Abu Dhabi	2000	8745868	53097	792512	139741	5259278
820	National Bank of Abu Dhabi	2001	7505405	66767	879537	165473	5538325
821	National Bank of Abu Dhabi	2002	9271368	101511	1049122	178135	6759292
822	National Bank of Abu Dhabi	2003	10389026	98979	1193764	219251	7922097
823	National Bank of Abu Dhabi	2004	12574295	99306	1411790	309707	9646943
824	National Bank of Abu Dhabi	2005	18958475	105786	1994282	702600	14014431
825	National Bank of Abu Dhabi	2006	22550497	115480	2452090	573424	15653043
826	National Bank of Fujairah	2000	594200	16501	132444	13996	436297
827	National Bank of Fujairah	2001	554064	15657	146576	19061	412880
828	National Bank of Fujairah	2002	549353	14786	168305	21974	437168
829	National Bank of Fujairah	2003	673465	14105	234173	25323	569694
830	National Bank of Fujairah	2004	867638	13805	268046	34173	751777
831	National Bank of Fujairah	2005	1194227	14541	364575	47869	872975
832	National Bank of Fujairah	2006	1749244	18816	401715	64697	1384643
833	National Bank of Fujairah	2007	2550034	23308	489911	88169	1928986
834	National Bank of Fujairah	2008	2599837	24888	424398	-13696	2460939
835	National Bank of Fujairah	2009	2179387	24724	454323	28400	2128468
836	National Bank of Fujairah	2010	2478992	23472	503063	46535	2373506
837	National Bank of Fujairah	2011	2962233	22383	561253	76487	2860531
838	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2000	358884	5364	130919	13615	371845
839	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2001	504752	12689	137046	16392	480354
840	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2002	630007	14486	150742	20558	536637
841	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2003	831940	16038	176419	25895	681443
842	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2004	1176256	16828	217563	35180	987284
843	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2005	1474363	25677	275807	50456	1454949
844	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2006	1656664	23254	339578	70470	1855276
845	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2007	2034854	31532	429408	109299	2225323
846	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2008	2679238	102682	566018	173179	2981756
847	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2009	3508564	168114	761607	197713	3656828

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
848	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2010	4484820	210184	1011954	273029	4466086
849	National Bank of Ras Al-Khaimah (P.S.C.) (The)-RAKBANK	2011	5071368	259278	1278938	327706	5001634
850	National Bank of Umm Al-Qaiwain	2000	328087	19142	122178	16229	317332
851	National Bank of Umm Al-Qaiwain	2001	327570	18189	126018	16093	315344
852	National Bank of Umm Al-Qaiwain	2002	314364	17291	118257	18108	306767
853	National Bank of Umm Al-Qaiwain	2003	371219	16610	123431	18788	367080
854	National Bank of Umm Al-Qaiwain	2004	494023	17209	151749	28319	486399
855	National Bank of Umm Al-Qaiwain	2005	571355	24534	377672	69326	713029
856	National Bank of Umm Al-Qaiwain	2006	718856	28727	385106	23962	1122668
857	National Bank of Umm Al-Qaiwain	2007	1758584	28182	469081	90892	1342192
858	National Bank of Umm Al-Qaiwain	2008	2513982	27257	757549	77250	2681607
859	National Bank of Umm Al-Qaiwain	2009	2339224	24969	820313	92880	2256664
860	National Bank of Umm Al-Qaiwain	2010	2186140	28536	870143	95521	2100694
861	National Bank of Umm Al-Qaiwain	2011	1930592	25759	903499	87134	1838012
862	Noor Islamic Bank	2007	4875920	762097	876943	-65870	2876341
863	Noor Islamic Bank	2008	4798530	371681	1019442	139115	3854894
864	Noor Islamic Bank	2009	3833329	230034	671232	-302519	3361389
865	Noor Islamic Bank	2010	4337563	213587	519891	-151967	3397767
866	Noor Islamic Bank	2011	3942900	201743	533152	13397	2897454
867	Sharjah Islamic Bank	2002	446590	10075	171436	15248	582110
868	Sharjah Islamic Bank	2003	516052	9367	173479	16692	643649
869	Sharjah Islamic Bank	2004	724003	9558	191913	19415	788673
870	Sharjah Islamic Bank	2005	836705	13778	573560	50674	1198121
871	Sharjah Islamic Bank	2006	1226984	156760	574377	54622	1532362
872	Sharjah Islamic Bank	2007	2016419	171899	606236	82206	1770810
873	Sharjah Islamic Bank	2008	2742491	218788	1133261	63063	2778434
874	Sharjah Islamic Bank	2009	2860177	198666	1161144	70824	2728850
875	Sharjah Islamic Bank	2010	3010265	223526	1184152	72566	2628673
876	Sharjah Islamic Bank	2011	3076869	232267	1199782	68373	2839319
877	Union National Bank	2000	2878965	27529	365718	55112	2029462

	Bank	Year	Deposit thousand USD	Fixed Asset thousand USD	Equity thousand USD	Net Income thousand USD	Loans thousand USD
878	Union National Bank	2001	3169857	32376	380939	66140	2155670
879	Union National Bank	2002	3495875	30960	462383	81770	2364411
880	Union National Bank	2003	3797495	30796	542056	102410	2668291
881	Union National Bank	2004	5544643	30442	603485	123322	4397577
882	Union National Bank	2005	7135684	36406	1425024	314227	5637277
883	Union National Bank	2006	8323649	63036	1641334	274881	7487869
884	Union National Bank	2007	11169258	76133	1825650	321144	10177971
885	Union National Bank	2008	13755834	99278	2095575	392430	13731627
886	Union National Bank	2009	15269653	101538	2904724	315208	13823989
887	Union National Bank	2010	17656365	99714	3248713	367597	15404520
888	Union National Bank	2011	17530946	97536	3558285	408550	15679074
889	United Arab Bank PJSC	2000	358747	3513	106467	19578	364847
890	United Arab Bank PJSC	2001	440082	4166	118530	20041	431613
891	United Arab Bank PJSC	2002	582219	3948	133016	21157	563268
892	United Arab Bank PJSC	2003	700395	4820	156133	24071	644466
893	United Arab Bank PJSC	2004	843513	4792	260994	42151	803730
894	United Arab Bank PJSC	2005	980640	4547	297590	43077	909735
895	United Arab Bank PJSC	2006	1312103	11709	349299	57536	1073873
896	United Arab Bank PJSC	2007	1652743	12689	365228	68128	1500531
897	United Arab Bank PJSC	2008	1415085	17127	452771	76460	1299796
898	United Arab Bank PJSC	2009	1579033	19959	503199	83867	1496937
899	United Arab Bank PJSC	2010	2367325	28918	553029	89912	2135793

Appendix (C) Descriptive statistic of inputs and outputs

		Dposit	Fixed Asset	Equity	Net Income	Loans
Bahrain	Mean	2,675,423.37	50,129.07	589,760.43	31,286.24	1,551,722.42
	Median	791,300.00	20,207.45	339,327.13	23,035.11	304,498.94
	St.Dev.	5,234,299.40	81,540.53	659,113.94	169,606.30	3,120,135.69
	Min	5,200.00	100.00	23,700.00	-836,000.00	900.00
	Max	26,867,000.00	484,000.00	4,019,000.00	583,000.00	15,921,000.00
Iran	Mean	15,308,603.78	749,597.33	1,065,464.94	181,709.39	11,773,751.17
	Median	14,960,205.43	664,805.99	908,541.00	126,006.70	10,607,196.81
	St.Dev.	12,081,310.86	663,324.81	842,227.28	159,610.93	9,065,637.77
	Min	3,629.56	1,335.88	38,951.00	2,205.46	189.04
	Max	51,185,839.85	2,424,239.18	3,325,713.74	707,679.07	36,543,044.76
Iraq	Mean	942,024.45	18,453.89	145,894.04	34,873.50	189,017.44
	Median	165,519.36	7,100.00	66,610.26	8,476.92	36,033.62
	St.Dev.	2,699,257.17	33,399.27	272,723.62	84,298.48	473,832.11
	Min	5,116.91	572.70	7,457.77	-3,314.02	108.15
	Max	13,321,300.00	150,976.33	1,512,100.00	360,600.00	2,392,900.00
Kuwait	Mean	8,912,134.67	230,204.90	1,352,169.97	167,082.44	6,137,739.71
	Median	7,032,925.02	85,347.99	985,323.42	137,267.69	4,652,172.52
	St.Dev.	7,243,637.47	544,663.79	1,213,783.87	255,985.51	5,264,422.03
	Min	682,876.72	7,534.25	137,706.10	-1,302,772.23	50,684.93
	Max	37,024,767.18	2,753,051.01	5,793,440.78	1,191,941.40	26,156,856.05
Oman	Mean	2,848,602.60	33,686.11	464,203.26	59,397.82	2,485,669.71
	Median	2,006,501.96	23,146.94	317,815.35	48,114.43	1,662,158.66
	St.Dev.	2,830,173.58	34,757.02	466,275.50	67,401.85	2,441,776.72
	Min	581,014.31	8,842.65	99,869.96	-134,720.42	553,446.04
	Max	14,515,994.88	194,538.36	2,264,239.28	305,591.68	12,534,200.33
Qatar	Mean	5,583,190.64	64,886.03	1,190,340.79	201,426.82	4,482,392.46
	Median	3,180,027.63	31,785.72	763,818.72	127,912.09	2,776,318.82
	St.Dev.	8,090,820.03	76,406.06	1,266,730.77	250,467.97	6,045,184.14
	Min	111,483.52	494.51	29,780.22	8,818.68	125,274.73
	Max	49,399,727.69	312,115.40	6,811,181.65	1,566,538.54	36,180,221.55
Saudi Arabia	Mean	14,785,281.94	212,571.68	2,512,104.29	435,350.35	9,900,854.92
	Median	10,901,474.37	135,740.99	1,552,066.77	244,365.82	6,358,611.53
	St.Dev.	13,785,290.09	210,258.84	2,257,074.87	477,834.83	9,310,058.48
	Min	34,985.00	13,700.00	174,926.57	-66,240.00	201,845.00
	Max	69,172,563.61	966,266.72	9,489,413.83	1,967,546.77	37,438,828.62
Unied Arab Emirate	Mean	5,777,534.38	87,417.82	1,056,928.31	127,169.17	5,025,029.07
	Median	2,139,196.71	30,755.62	482,736.55	52,825.05	1,813,301.54
	St.Dev.	9,996,556.17	132,254.63	1,603,090.44	209,991.29	9,465,286.13
	Min	43,539.82	27.23	17,426.82	-302,518.72	1,987.75
	Max	60,432,701.78	762,097.00	9,525,146.24	1,009,067.38	58,438,202.15

Source: BankScope Database (Bureau van Dijk- 2013)

Appendix (D) Summary range tables for drawing boxplots

Summary range of deposit

	Bahrain	Iran	Iraq	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Min	5,200.00	3,629.56	5,116.91	682,876.72	581,014.31	111,483.52	34,985.00	43,539.82
25 percentile	202,825.00	6,024,995.78	57,937.46	3,985,076.40	1,332,119.64	1,209,560.50	3,403,578.33	811,640.27
Median	786,717.83	14,960,205.43	165,519.36	7,032,925.02	2,006,501.96	3,180,027.63	10,901,474.37	2,139,196.71
75 percentile	2,462,101.10	21,045,286.94	299,100.00	11,892,515.99	3,158,647.61	6,707,198.13	23,257,717.15	5,774,703.81
Max	26,867,000.00	51,185,839.85	13,321,300.00	37,024,767.18	14,515,994.88	49,399,727.69	69,172,563.61	60,432,701.78

Summary range of Fixed asset

	Bahrain	Iran	Iraq	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Min	100.00	1,335.88	572.70	7,534.25	8,842.65	494.51	13,700.00	27.23
25 percentile	3,709.44	161,383.49	3,720.99	43,257.77	13,003.90	18,049.45	76,632.47	11,654.19
Median	20,207.45	664,805.99	7,100.00	85,347.99	23,146.94	31,785.72	135,740.99	30,755.62
75 percentile	53,350.00	1,258,546.24	17,390.94	128,703.10	35,630.69	82,087.92	330,329.87	103,349.22
Max	484,000.00	2,424,239.18	150,976.33	2,753,051.01	194,538.36	312,115.40	966,266.72	762,097.00

Summary range of Equity

	Bahrain	Iran	Iraq	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Min	23,700.00	38,951.00	7,457.77	137,706.10	99,869.96	29,780.22	174,926.57	17,426.82
25 percentile	142,850.00	403,682.86	40,140.78	607,008.56	229,648.90	247,884.63	900,128.35	222,205.58
Median	339,327.13	908,541.00	66,610.26	985,323.42	317,815.35	763,818.72	1,552,066.77	482,736.55
75 percentile	876,975.00	1,591,840.38	112,808.04	1,607,250.60	489,987.00	1,559,642.93	3,453,813.51	1,135,806.66
Max	4,019,000.00	3,325,713.74	1,512,100.00	5,793,440.78	2,264,239.28	6,811,181.65	9,489,413.83	9,525,146.24

Summary range of net income

	Bahrain	Iran	Iraq	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Min	-836,000.00	2,205.46	-3,314.02	-1,302,772.23	-134,720.42	8,818.68	-66,240.00	-302,518.72
25 percentile	3,700.00	56,557.19	3,268.09	57,555.24	21,846.55	38,901.10	85,991.08	15,907.46
Median	23,035.11	126,006.70	8,476.92	137,267.69	48,114.43	127,912.09	244,365.82	52,825.05
75 percentile	87,950.53	273,773.51	15,912.39	254,679.19	70,481.14	267,472.54	667,268.72	156,997.96
Max	583,000.00	707,679.07	360,600.00	1,191,941.40	305,591.68	1,566,538.54	1,967,546.77	1,009,067.38

Summary range of loans

	Bahrain	Iran	Iraq	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Min	900.00	189.04	108.15	50,684.93	553,446.04	125,274.73	201,845.00	1,987.75
25 percentile	48,825.00	3,604,005.94	7,456.09	2,570,411.07	1,182,834.86	974,285.76	2,647,630.20	559,251.18
Median	304,498.94	10,607,196.81	36,033.62	4,652,172.52	1,662,158.66	2,776,318.82	6,358,611.53	1,813,301.54
75 percentile	1,445,345.77	16,988,824.78	93,635.47	7,959,364.91	3,054,616.40	5,481,621.15	16,236,001.47	4,587,433.57
Max	15,921,000.00	36,543,044.76	2,392,900.00	26,156,856.05	12,534,200.33	36,180,221.55	37,438,828.62	58,438,202.15

Appendix (E) Bank-specific values for banks in MEOE countries

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
1	Abu Dhabi Commercial Bank	2000	31.40	13.91	6.94	15.75
2	Abu Dhabi Commercial Bank	2001	31.77	14.22	8.16	15.80
3	Abu Dhabi Commercial Bank	2002	30.37	15.75	8.20	15.84
4	Abu Dhabi Commercial Bank	2003	26.17	15.58	8.40	15.87
5	Abu Dhabi Commercial Bank	2004	29.22	12.92	2.97	16.16
6	Abu Dhabi Commercial Bank	2005	30.22	14.93	1.67	16.57
7	Abu Dhabi Commercial Bank	2006	23.00	13.23	1.55	16.91
8	Abu Dhabi Commercial Bank	2007	33.79	10.74	1.50	17.18
9	Abu Dhabi Commercial Bank	2008	21.75	10.72	1.79	17.51
10	Abu Dhabi Commercial Bank	2009	22.60	11.92	3.50	17.59
11	Abu Dhabi Commercial Bank	2010	20.68	10.98	4.88	17.70
12	Abu Dhabi Commercial Bank	2011	22.43	12.02	4.38	17.73
13	Abu Dhabi Investment Company	2000	65.65	14.40	9.18	14.37
14	Abu Dhabi Investment Company	2001	37.35	14.96	9.16	14.22
15	Abu Dhabi Investment Company	2002	39.30	15.24	2.38	14.22
16	Abu Dhabi Investment Company	2003	40.66	17.34	2.62	14.23
17	Abu Dhabi Investment Company	2004	39.58	19.71	3.01	14.33
18	Abu Dhabi Investment Company	2005	44.59	28.00	1.14	14.60
19	Abu Dhabi Investment Company	2006	33.98	27.21	2.04	14.47
20	Abu Dhabi Investment Company	2007	51.80	33.60	1.59	14.59
21	Abu Dhabi Investment Company	2008	32.74	20.13	0.67	14.48
22	Abu Dhabi Investment Company	2009	71.36	19.72	0.28	14.68
23	Abu Dhabi Investment Company	2010	71.44	14.67	0.71	14.80
24	Abu Dhabi Investment Company	2011	62.19	13.72	1.34	14.60
25	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2000	102.73	27.05	0.74	13.99
26	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2001	72.63	20.13	0.44	14.33
27	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2002	65.54	16.06	0.62	14.57
28	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2003	32.13	15.19	0.38	14.74
29	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2004	37.01	11.87	0.95	15.06
30	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2005	36.18	9.08	1.57	15.61
31	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2006	41.03	7.63	1.19	16.11
32	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2007	45.62	12.31	1.43	16.30
33	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2008	28.58	11.01	1.70	16.45
34	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2009	36.34	11.15	4.15	16.67
35	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2010	37.39	10.78	4.53	16.84
36	Abu Dhabi Islamic Bank - Public Joint Stock Co.	2011	27.27	11.53	5.81	16.82
37	Al Hilal Bank PJSC	2007	32.68	10.65	1.10	15.47
38	Al Hilal Bank PJSC	2008	63.71	14.77	0.22	14.23

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
39	Al Hilal Bank PJSC	2009	22.54	10.55	0.46	15.37
40	Al Hilal Bank PJSC	2010	28.70	7.65	1.28	15.76
41	Al Hilal Bank PJSC	2011	15.77	9.64	2.45	15.86
42	Amlak Finance PJSC	2004	22.86	44.83	0.33	13.10
43	Amlak Finance PJSC	2005	38.03	39.33	0.75	14.03
44	Amlak Finance PJSC	2006	10.76	35.05	0.60	14.13
45	Amlak Finance PJSC	2007	9.42	21.07	0.40	14.76
46	Amlak Finance PJSC	2008	15.48	13.00	1.24	15.28
47	Amlak Finance PJSC	2009	7.12	14.94	3.78	15.17
48	Amlak Finance PJSC	2010	6.47	14.45	6.74	15.09
49	Arab Bank for Investment & Foreign Trade-Al Masraf	2000	91.20	22.51	23.26	14.23
50	Arab Bank for Investment & Foreign Trade-Al Masraf	2001	94.34	21.35	26.97	14.27
51	Arab Bank for Investment & Foreign Trade-Al Masraf	2002	93.81	21.77	26.93	14.27
52	Arab Bank for Investment & Foreign Trade-Al Masraf	2003	88.32	25.85	26.10	14.09
53	Arab Bank for Investment & Foreign Trade-Al Masraf	2004	75.98	24.13	20.67	14.22
54	Arab Bank for Investment & Foreign Trade-Al Masraf	2005	77.15	22.64	19.48	14.34
55	Arab Bank for Investment & Foreign Trade-Al Masraf	2006	80.98	21.51	18.29	14.53
56	Arab Bank for Investment & Foreign Trade-Al Masraf	2007	73.33	25.36	10.79	14.86
57	Arab Bank for Investment & Foreign Trade-Al Masraf	2008	40.11	19.94	6.28	15.14
58	Arab Bank for Investment & Foreign Trade-Al Masraf	2009	36.07	25.46	7.96	14.97
59	Arab Bank for Investment & Foreign Trade-Al Masraf	2010	45.11	23.58	5.06	15.11
60	Arab Bank for Investment & Foreign Trade-Al Masraf	2011	50.45	22.29	6.95	15.04
61	Bank of Sharjah	2000	50.84	18.16	5.54	15.56
62	Bank of Sharjah	2001	55.31	18.81	5.73	13.17
63	Bank of Sharjah	2002	44.57	17.61	5.02	13.31
64	Bank of Sharjah	2003	66.70	29.48	4.25	13.62
65	Bank of Sharjah	2004	54.13	30.03	3.75	13.74
66	Bank of Sharjah	2005	68.45	33.43	2.77	14.26
67	Bank of Sharjah	2006	53.92	27.49	1.26	14.55
68	Bank of Sharjah	2007	54.05	21.31	1.37	14.89
69	Bank of Sharjah	2008	18.40	24.29	2.49	15.28
70	Bank of Sharjah	2009	22.67	22.68	3.03	15.41
71	Bank of Sharjah	2010	29.06	21.32	4.43	15.54
72	Bank of Sharjah	2011	28.55	20.06	6.15	15.56
73	Commercial Bank International	2000	27.91	14.73	8.94	13.20
74	Commercial Bank International	2001	29.01	13.87	6.59	13.39
75	Commercial Bank International	2002	28.75	13.24	6.99	13.58
76	Commercial Bank International	2003	25.69	13.82	8.72	13.63
77	Commercial Bank International	2004	29.49	12.69	8.68	13.87
78	Commercial Bank International	2005	41.80	12.90	12.37	14.17

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
79	Commercial Bank International	2006	27.60	15.11	7.07	14.51
80	Commercial Bank International	2007	20.15	14.20	4.46	14.92
81	Commercial Bank International	2008	0.86	14.43	5.43	14.93
82	Commercial Bank International	2009	16.97	15.40	9.07	14.91
83	Commercial Bank International	2010	18.47	14.19	12.05	14.98
84	Commercial Bank International	2011	10.47	15.15	11.54	14.95
85	Commercial Bank of Dubai P.S.C.	2000	37.00	15.86	3.94	14.48
86	Commercial Bank of Dubai P.S.C.	2001	40.08	16.80	4.59	14.51
87	Commercial Bank of Dubai P.S.C.	2002	39.13	18.72	4.49	14.58
88	Commercial Bank of Dubai P.S.C.	2003	33.56	19.16	3.70	14.67
89	Commercial Bank of Dubai P.S.C.	2004	24.62	19.00	2.82	14.90
90	Commercial Bank of Dubai P.S.C.	2005	32.71	18.46	1.73	15.24
91	Commercial Bank of Dubai P.S.C.	2006	27.62	20.37	1.40	15.44
92	Commercial Bank of Dubai P.S.C.	2007	25.54	15.64	1.35	15.93
93	Commercial Bank of Dubai P.S.C.	2008	11.32	13.15	1.13	16.09
94	Commercial Bank of Dubai P.S.C.	2009	12.60	14.55	2.53	16.12
95	Commercial Bank of Dubai P.S.C.	2010	21.24	15.27	4.42	16.17
96	Commercial Bank of Dubai P.S.C.	2011	20.07	16.53	6.23	16.16
97	Emirates Investment Bank PJSC	2000	29.58	27.79	0.00	11.05
98	Emirates Investment Bank PJSC	2001	20.11	33.85	0.00	11.23
99	Emirates Investment Bank PJSC	2002	21.40	32.16	0.00	11.34
100	Emirates Investment Bank PJSC	2003	19.89	37.72	0.00	11.59
101	Emirates Investment Bank PJSC	2004	17.95	47.93	0.00	11.83
102	Emirates Investment Bank PJSC	2005	15.01	61.33	0.00	12.07
103	Emirates Investment Bank PJSC	2006	17.41	45.54	0.00	11.82
104	Emirates Investment Bank PJSC	2007	20.84	56.30	0.00	12.01
105	Emirates Investment Bank PJSC	2008	16.09	26.25	0.00	11.53
106	Emirates Investment Bank PJSC	2009	19.90	19.04	0.00	12.09
107	Emirates Investment Bank PJSC	2010	14.58	18.09	0.00	12.57
108	Emirates Investment Bank PJSC	2011	20.33	13.79	0.00	12.89
109	Emirates Islamic Bank PJSC	2005	9.23	17.92	3.59	14.08
110	Emirates Islamic Bank PJSC	2006	5.40	9.22	1.41	14.86
111	Emirates Islamic Bank PJSC	2007	6.34	7.83	1.43	15.35
112	Emirates Islamic Bank PJSC	2008	11.32	6.34	1.12	15.79
113	Emirates Islamic Bank PJSC	2009	9.50	11.36	3.13	15.75
114	Emirates Islamic Bank PJSC	2010	6.54	8.94	5.32	16.00
115	Emirates Islamic Bank PJSC	2011	7.99	11.54	9.44	15.58
116	Emirates NBD PJSC	2006	23.86	9.26	1.21	17.08
117	Emirates NBD PJSC	2007	23.63	9.91	1.17	18.05
118	Emirates NBD PJSC	2008	12.92	9.12	1.56	18.16
119	Emirates NBD PJSC	2009	9.80	11.35	2.70	18.16
120	Emirates NBD PJSC	2010	19.13	11.79	4.05	18.17
121	Emirates NBD PJSC	2011	13.42	12.29	5.97	18.17
122	First Gulf Bank	2000	47.89	19.76	6.74	13.39

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
123	First Gulf Bank	2001	34.28	15.95	7.51	13.75
124	First Gulf Bank	2002	23.57	13.27	8.72	14.12
125	First Gulf Bank	2003	12.06	10.78	5.58	14.49
126	First Gulf Bank	2004	46.73	13.89	4.76	15.06
127	First Gulf Bank	2005	52.88	29.82	2.96	15.78
128	First Gulf Bank	2006	47.17	18.81	1.82	16.38
129	First Gulf Bank	2007	25.84	13.83	1.45	16.81
130	First Gulf Bank	2008	10.59	15.46	1.42	17.19
131	First Gulf Bank	2009	11.99	18.25	2.72	17.35
132	First Gulf Bank	2010	16.38	17.50	3.33	17.46
133	First Gulf Bank	2011	16.83	17.00	3.34	17.57
134	Invest Bank	2000	42.71	18.08	17.47	13.42
135	Invest Bank	2001	38.36	19.31	18.67	13.46
136	Invest Bank	2002	31.54	19.15	16.88	13.53
137	Invest Bank	2003	26.23	19.21	13.05	13.70
138	Invest Bank	2004	18.43	26.31	13.65	13.82
139	Invest Bank	2005	43.78	25.16	14.82	14.30
140	Invest Bank	2006	48.07	23.74	15.99	14.37
141	Invest Bank	2007	48.71	21.52	10.19	14.59
142	Invest Bank	2008	37.23	21.56	15.09	13.99
143	Invest Bank	2009	19.33	19.96	5.14	14.85
144	Invest Bank	2010	21.72	19.53	5.36	14.85
145	Invest Bank	2011	16.94	20.40	4.92	14.86
146	Mashreqbank	2000	50.77	11.92	8.00	15.61
147	Mashreqbank	2001	53.33	12.89	9.91	15.64
148	Mashreqbank	2002	47.01	14.86	9.61	15.68
149	Mashreqbank	2003	41.82	16.03	3.40	15.78
150	Mashreqbank	2004	43.99	16.45	3.76	15.98
151	Mashreqbank	2005	53.54	17.52	3.41	16.36
152	Mashreqbank	2006	50.56	14.01	3.05	16.55
153	Mashreqbank	2007	59.96	11.97	2.77	16.99
154	Mashreqbank	2008	23.23	11.46	2.00	17.05
155	Mashreqbank	2009	43.16	12.52	4.02	17.06
156	National Bank of Abu Dhabi	2000	42.25	7.99	3.56	16.11
157	National Bank of Abu Dhabi	2001	24.17	10.02	3.29	15.99
158	National Bank of Abu Dhabi	2002	28.62	9.87	2.72	16.18
159	National Bank of Abu Dhabi	2003	21.67	10.05	2.25	16.29
160	National Bank of Abu Dhabi	2004	26.90	9.20	1.98	16.55
161	National Bank of Abu Dhabi	2005	30.55	8.75	1.62	16.94
162	National Bank of Abu Dhabi	2006	36.75	8.92	1.57	17.13
163	National Bank of Fujairah	2000	35.53	17.60	8.80	13.53
164	National Bank of Fujairah	2001	33.20	20.42	7.87	13.48
165	National Bank of Fujairah	2002	24.58	23.02	8.07	13.50
166	National Bank of Fujairah	2003	22.06	25.26	5.02	13.74

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
167	National Bank of Fujairah	2004	43.94	23.26	3.48	13.96
168	National Bank of Fujairah	2005	58.43	22.85	2.93	14.28
169	National Bank of Fujairah	2006	44.83	18.19	2.04	14.61
170	National Bank of Fujairah	2007	43.65	14.64	1.50	15.02
171	National Bank of Fujairah	2008	25.64	12.15	3.08	15.07
172	National Bank of Fujairah	2009	30.90	14.03	5.65	14.99
173	National Bank of Fujairah	2010	26.77	14.30	7.02	15.07
174	National Bank of Fujairah	2011	25.33	13.82	5.85	15.22
175	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2000	33.52	25.77	7.61	13.14
176	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2001	31.07	20.77	6.33	13.40
177	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2002	37.56	18.89	6.85	13.59
178	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2003	35.29	17.25	6.45	13.84
179	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2004	30.23	15.32	4.75	14.17
180	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2005	27.03	13.88	3.07	14.50
181	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2006	21.00	14.10	2.78	14.69
182	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2007	24.48	14.37	2.60	14.91
183	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2008	18.50	14.93	2.28	15.15
184	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2009	19.54	16.34	3.01	15.35
185	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2010	19.66	17.38	1.84	15.58
186	National Bank of Ras Al-Khaimah (P.S.C.) - RAKBANK	2011	13.05	19.17	1.81	15.71
187	National Bank of Umm Al-Qaiwain	2000	33.47	26.46	4.97	13.04
188	National Bank of Umm Al-Qaiwain	2001	34.49	27.04	6.48	13.05
189	National Bank of Umm Al-Qaiwain	2002	35.69	25.91	7.81	13.03
190	National Bank of Umm Al-Qaiwain	2003	30.73	23.72	7.57	13.16
191	National Bank of Umm Al-Qaiwain	2004	20.76	23.16	4.86	13.39
192	National Bank of Umm Al-Qaiwain	2005	31.82	36.77	3.22	13.84
193	National Bank of Umm Al-Qaiwain	2006	22.96	27.37	2.28	14.16
194	National Bank of Umm Al-Qaiwain	2007	47.80	20.44	2.58	14.65
195	National Bank of Umm Al-Qaiwain	2008	28.18	20.54	1.45	15.12
196	National Bank of Umm Al-Qaiwain	2009	47.57	21.70	2.40	15.15
197	National Bank of Umm Al-Qaiwain	2010	37.19	24.15	3.42	15.10
198	National Bank of Umm Al-Qaiwain	2011	32.58	28.34	4.05	14.98
199	Noor Islamic Bank	2007	21.96	13.48	6.62	15.43
200	Noor Islamic Bank	2008	30.56	17.19	1.72	15.60
201	Noor Islamic Bank	2009	16.06	14.62	4.28	15.34
202	Noor Islamic Bank	2010	19.00	10.50	7.40	15.42
203	Noor Islamic Bank	2011	22.25	11.60	13.10	15.34
204	Sharjah Islamic Bank	2002	11.24	26.24	7.90	13.39
205	Sharjah Islamic Bank	2003	9.49	24.15	7.13	13.48
206	Sharjah Islamic Bank	2004	14.47	20.33	5.71	13.76

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
207	Sharjah Islamic Bank	2005	11.17	39.76	3.86	14.18
208	Sharjah Islamic Bank	2006	13.85	27.60	2.95	14.55
209	Sharjah Islamic Bank	2007	33.99	20.46	3.02	14.90
210	Sharjah Islamic Bank	2008	25.82	26.79	0.83	15.26
211	Sharjah Islamic Bank	2009	30.30	26.69	1.25	15.29
212	Sharjah Islamic Bank	2010	37.68	26.09	1.64	15.33
213	Sharjah Islamic Bank	2011	41.22	24.85	3.33	15.39
214	Union National Bank	2000	30.67	11.08	6.79	15.01
215	Union National Bank	2001	33.84	10.55	7.82	15.10
216	Union National Bank	2002	34.38	11.54	7.90	15.20
217	Union National Bank	2003	37.46	11.63	8.13	15.36
218	Union National Bank	2004	25.37	9.02	5.36	15.72
219	Union National Bank	2005	43.04	14.98	3.86	16.07
220	Union National Bank	2006	34.62	14.50	1.94	16.24
221	Union National Bank	2007	31.02	12.09	1.32	16.53
222	Union National Bank	2008	14.40	11.80	1.25	16.69
223	Union National Bank	2009	28.24	14.09	1.57	16.84
224	Union National Bank	2010	25.06	14.59	2.05	16.92
225	Union National Bank	2011	23.42	15.85	2.76	16.93
226	United Arab Bank PJSC	2000	31.40	20.98	5.48	13.05
227	United Arab Bank PJSC	2001	27.55	21.98	4.94	13.09
228	United Arab Bank PJSC	2002	26.49	20.61	4.49	13.26
229	United Arab Bank PJSC	2003	24.16	18.11	3.88	13.51
230	United Arab Bank PJSC	2004	23.96	17.99	3.78	13.67
231	United Arab Bank PJSC	2005	29.01	23.19	3.43	13.93
232	United Arab Bank PJSC	2006	30.45	22.82	3.31	14.08
233	United Arab Bank PJSC	2007	38.83	20.74	2.69	14.34
234	United Arab Bank PJSC	2008	22.67	17.74	2.09	14.54
235	United Arab Bank PJSC	2009	32.53	23.77	2.72	14.46
236	United Arab Bank PJSC	2010	22.01	23.87	2.43	14.56
237	ABC Islamic Bank (E.C.)	2005	0.47	9.11	0.00	13.32
238	ABC Islamic Bank (E.C.)	2006	1.45	12.50	0.00	13.62
239	ABC Islamic Bank (E.C.)	2007	2.03	16.05	0.00	14.13
240	ABC Islamic Bank (E.C.)	2008	0.16	10.47	0.00	14.19
241	ABC Islamic Bank (E.C.)	2009	0.41	13.39	0.00	14.09
242	ABC Islamic Bank (E.C.)	2010	2.13	17.71	0.00	14.03
243	ABC Islamic Bank (E.C.)	2011	4.78	22.00	0.00	13.85
244	Albaraka Banking Group B.S.C.	2003	38.56	11.92	5.92	15.23
245	Albaraka Banking Group B.S.C.	2004	38.02	11.19	4.95	15.44
246	Albaraka Banking Group B.S.C.	2005	34.66	12.16	4.16	15.66
247	Albaraka Banking Group B.S.C.	2006	29.62	15.88	3.39	15.85
248	Albaraka Banking Group B.S.C.	2007	28.56	15.53	2.71	16.13
249	Albaraka Banking Group B.S.C.	2008	12.74	14.20	2.55	16.21
250	Alubaf Arab International Bank	2007	101.98	19.78	1.34	10.70

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
251	Alubaf Arab International Bank	2008	103.91	19.97	1.51	13.15
252	Alubaf Arab International Bank	2009	99.68	15.11	0.65	13.50
253	Alubaf Arab International Bank	2010	106.96	20.81	2.11	13.89
254	Alubaf Arab International Bank	2011	93.23	24.06	1.76	13.82
255	Arab Banking Corporation BSC	2000	36.98	8.46	4.23	17.10
256	Arab Banking Corporation BSC	2001	33.64	8.69	4.25	17.09
257	Arab Banking Corporation BSC	2002	33.85	6.34	4.63	17.18
258	Arab Banking Corporation BSC	2003	30.04	6.97	4.57	17.22
259	Arab Banking Corporation BSC	2004	44.87	12.68	7.22	16.52
260	Arab Banking Corporation BSC	2005	30.88	11.22	5.60	16.68
261	Arab Banking Corporation BSC	2006	30.90	9.46	4.23	16.92
262	Arab Banking Corporation BSC	2007	23.64	6.59	2.52	17.30
263	Arab Banking Corporation BSC	2008	21.79	7.33	3.46	17.16
264	Arab Banking Corporation BSC	2009	23.36	9.94	4.63	17.07
265	Arab Banking Corporation BSC	2010	33.57	13.73	4.45	17.15
266	Arab Banking Corporation BSC	2011	31.93	16.07	4.67	17.03
267	Arcapita Bank B.S.C.	2007	95.09	28.04	16.34	15.15
268	Arcapita Bank B.S.C.	2008	52.37	27.83	10.73	15.45
269	Arcapita Bank B.S.C.	2009	62.45	36.56	7.73	15.29
270	Arcapita Bank B.S.C.	2010	75.09	30.67	5.55	15.06
271	Arcapita Bank B.S.C.	2011	73.43	30.05	6.56	15.13
272	Bahrain Islamic Bank B.S.C.	2004	60.74	20.72	7.35	13.43
273	Bahrain Islamic Bank B.S.C.	2005	47.23	22.42	0.87	13.66
274	Bahrain Islamic Bank B.S.C.	2006	54.85	17.16	0.57	13.96
275	Bahrain Islamic Bank B.S.C.	2007	35.50	28.41	0.64	14.38
276	Bahrain Islamic Bank B.S.C.	2008	20.96	19.04	1.79	14.66
277	Bahrain Islamic Bank B.S.C.	2009	26.34	12.07	2.24	14.62
278	BBK B.S.C.	2000	44.18	9.99	10.59	14.85
279	BBK B.S.C.	2001	45.99	10.22	17.61	14.89
280	BBK B.S.C.	2002	33.58	9.49	13.88	14.99
281	BBK B.S.C.	2003	27.04	9.48	10.69	15.07
282	BBK B.S.C.	2004	21.67	11.11	7.12	15.14
283	BBK B.S.C.	2005	16.97	11.57	4.52	15.20
284	BBK B.S.C.	2006	20.85	11.10	3.67	15.32
285	BBK B.S.C.	2007	30.41	11.34	3.62	15.53
286	BBK B.S.C.	2008	29.15	9.66	3.97	15.57
287	BBK B.S.C.	2009	33.39	10.14	4.82	15.62
288	BBK B.S.C.	2010	36.86	9.83	6.09	15.69
289	BBK B.S.C.	2011	28.11	8.61	6.54	15.81
290	BMB Investment Bank-Bahrain Middle East Bank	2005	35.41	16.15	0.00	12.03
291	BMB Investment Bank-Bahrain Middle East Bank	2006	41.33	26.87	0.00	12.06
292	BMB Investment Bank-Bahrain Middle East Bank	2007	91.25	39.47	0.00	12.11
293	BMB Investment Bank-Bahrain Middle East Bank	2008	58.61	42.79	0.00	11.52

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
294	BMB Investment Bank-Bahrain Middle East Bank	2009	22.18	31.23	0.00	11.24
295	BMB Investment Bank-Bahrain Middle East Bank	2010	123.76	33.96	0.00	11.21
296	BMB Investment Bank-Bahrain Middle East Bank	2011	88.33	40.73	0.00	11.17
297	BMI Bank BSC	2005	24.59	9.69	0.56	13.40
298	BMI Bank BSC	2006	17.63	8.01	0.60	13.78
299	BMI Bank BSC	2007	34.92	7.55	0.70	14.12
300	BMI Bank BSC	2008	44.29	15.78	1.64	14.59
301	BMI Bank BSC	2009	49.15	16.72	6.93	14.40
302	BMI Bank BSC	2010	45.49	14.63	14.39	14.27
303	BMI Bank BSC	2011	36.74	13.29	12.82	14.32
304	Capivest	2005	67.01	49.64	4.96	11.14
305	Capivest	2006	173.55	73.95	8.29	12.18
306	Capivest	2007	132.68	50.15	4.67	12.69
307	Capivest	2008	113.65	67.14	6.23	12.47
308	Capivest	2009	94.48	70.08	6.67	12.20
309	Capivest	2010	80.22	58.87	7.17	11.94
310	Capivest	2011	53.33	75.08	6.76	11.80
311	First energy bank	2007	220.33	99.04	0.00	13.80
312	First energy bank	2008	218.98	97.92	0.00	13.84
313	First energy bank	2009	207.17	85.48	0.00	14.03
314	First energy bank	2010	176.08	86.61	0.00	14.00
315	First energy bank	2011	279.11	84.73	0.00	14.02
316	Future Bank B.S.C.	2006	91.33	12.00	2.09	13.83
317	Future Bank B.S.C.	2007	94.08	11.68	2.69	14.10
318	Future Bank B.S.C.	2008	92.27	11.56	2.33	14.19
319	Future Bank B.S.C.	2009	95.21	13.46	4.05	14.19
320	Future Bank B.S.C.	2010	82.13	16.82	3.99	14.15
321	Future Bank B.S.C.	2011	90.76	18.15	8.43	14.16
322	Gulf Finance House BSC	2007	11.42	39.18	20.34	14.62
323	Gulf Finance House BSC	2008	61.08	27.75	19.25	15.06
324	Gulf Finance House BSC	2009	41.93	26.38	18.30	14.31
325	Gulf Finance House BSC	2010	8.62	11.42	18.32	13.83
326	Gulf Finance House BSC	2011	11.34	28.26	17.50	13.62
327	Gulf International Bank BSC	2000	27.97	7.64	16.81	16.53
328	Gulf International Bank BSC	2001	29.15	7.51	18.32	16.54
329	Gulf International Bank BSC	2002	32.31	6.64	18.75	16.60
330	Gulf International Bank BSC	2003	35.21	8.03	16.10	16.67
331	Gulf International Bank BSC	2004	52.11	8.04	13.33	16.76
332	Gulf International Bank BSC	2005	62.21	7.52	1.65	16.94
333	Gulf International Bank BSC	2006	40.49	7.59	1.01	17.03
334	Gulf International Bank BSC	2007	32.57	7.43	0.60	17.22
335	Gulf International Bank BSC	2008	23.16	7.69	2.07	17.04
336	Gulf International Bank BSC	2009	43.90	10.98	6.38	16.60

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
337	Gulf International Bank BSC	2010	48.71	12.35	7.88	16.56
338	Gulf International Bank BSC	2011	63.91	11.69	8.40	16.64
339	Investcorp Bank BSC	2000	9.07	27.47	10.78	14.89
340	Investcorp Bank BSC	2001	9.72	25.45	11.78	15.05
341	Investcorp Bank BSC	2002	15.47	26.74	10.24	15.09
342	Investcorp Bank BSC	2003	29.81	27.59	9.87	15.17
343	Investcorp Bank BSC	2004	44.52	26.78	8.97	15.23
344	Investcorp Bank BSC	2005	71.89	19.84	14.98	15.29
345	Investcorp Bank BSC	2006	74.47	25.69	6.26	15.24
346	Investcorp Bank BSC	2007	191.77	32.08	15.84	15.28
347	Investcorp Bank BSC	2008	152.88	25.96	7.49	15.38
348	Investcorp Bank BSC	2009	214.51	24.71	17.43	15.10
349	Investcorp Bank BSC	2010	278.41	29.10	17.52	15.04
350	Investcorp Bank BSC	2011	259.98	37.09	22.61	14.87
351	Investors Bank BSC	2003	2.27	76.04	0.00	10.68
352	Investors Bank BSC	2004	1.63	69.51	0.00	11.02
353	Investors Bank BSC	2005	2.34	94.72	0.00	11.84
354	Investors Bank BSC	2006	1.39	95.00	0.00	11.90
355	Investors Bank BSC	2007	9.57	94.75	0.00	11.83
356	Investors Bank BSC	2008	12.29	92.32	0.00	11.46
357	Investors Bank BSC	2009	8.70	90.04	0.00	11.22
358	Investors Bank BSC	2010	7.68	83.98	0.00	10.74
359	Investors Bank BSC	2011	2.90	82.35	0.00	10.66
360	Ithmaar Bank B.S.C.	2005	19.80	57.16	5.72	13.00
361	Ithmaar Bank B.S.C.	2006	31.49	30.97	3.57	14.97
362	Ithmaar Bank B.S.C.	2007	24.09	31.49	2.57	15.22
363	Ithmaar Bank B.S.C.	2008	35.57	21.36	3.55	15.50
364	Ithmaar Bank B.S.C.	2009	26.89	15.35	6.00	15.62
365	Ithmaar Bank B.S.C.	2010	28.54	13.25	9.97	15.72
366	Ithmaar Bank B.S.C.	2011	28.24	11.73	8.65	15.75
367	Khaleeji Commercial Bank	2006	68.89	44.23	1.60	12.45
368	Khaleeji Commercial Bank	2007	66.41	50.09	2.23	13.48
369	Khaleeji Commercial Bank	2008	49.24	29.67	2.94	14.03
370	Khaleeji Commercial Bank	2009	41.76	26.73	5.07	14.05
371	Khaleeji Commercial Bank	2010	29.67	28.19	5.78	13.92
372	Khaleeji Commercial Bank	2011	30.79	26.57	6.12	13.99
373	National Bank of Bahrain	2000	36.71	10.38	3.92	14.83
374	National Bank of Bahrain	2001	51.44	12.21	4.02	14.87
375	National Bank of Bahrain	2002	51.44	12.39	3.58	14.89
376	National Bank of Bahrain	2003	45.99	12.00	3.84	15.01
377	National Bank of Bahrain	2004	36.98	12.82	2.77	15.10
378	National Bank of Bahrain	2005	40.65	14.56	2.12	15.20
379	National Bank of Bahrain	2006	32.39	13.25	1.86	15.31
380	National Bank of Bahrain	2007	34.78	12.80	1.51	15.44

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
381	National Bank of Bahrain	2008	28.25	10.69	1.16	15.50
382	National Bank of Bahrain	2009	24.33	11.40	1.27	15.54
383	National Bank of Bahrain	2010	32.35	11.57	1.65	15.62
384	National Bank of Bahrain	2011	35.22	11.50	1.89	15.66
385	TAIB Bank B.S.C.	2006	98.35	27.14	25.21	13.21
386	TAIB Bank B.S.C.	2007	101.93	26.94	28.29	13.20
387	TAIB Bank B.S.C.	2008	90.61	23.89	27.34	13.14
388	TAIB Bank B.S.C.	2009	48.27	37.08	32.96	12.73
389	TAIB Bank B.S.C.	2010	65.45	37.03	34.29	12.87
390	TAIB Bank B.S.C.	2011	84.44	34.36	48.58	12.98
391	TAIB Bank B.S.C.	2012	122.16	39.08	54.37	12.98
392	TAIB Bank B.S.C.	2013	112.96	45.19	32.30	13.07
393	TAIB Bank B.S.C.	2014	82.76	35.90	31.40	12.82
394	TAIB Bank B.S.C.	2015	76.10	29.91	34.03	12.76
395	TAIB Bank B.S.C.	2016	68.51	21.57	46.89	12.51
396	TAIB Bank B.S.C.	2017	61.89	23.44	46.47	12.18
397	United Gulf Bank (BSC) EC	2000	72.30	28.56	15.30	13.48
398	United Gulf Bank (BSC) EC	2001	91.32	23.19	10.08	13.74
399	United Gulf Bank (BSC) EC	2002	72.69	24.04	11.08	13.75
400	United Gulf Bank (BSC) EC	2003	75.99	26.59	12.01	13.99
401	United Gulf Bank (BSC) EC	2004	66.45	23.81	5.17	14.14
402	United Gulf Bank (BSC) EC	2005	77.83	27.99	2.14	14.34
403	United Gulf Bank (BSC) EC	2006	76.26	25.22	2.07	14.67
404	United Gulf Bank (BSC) EC	2007	87.41	30.17	3.14	14.80
405	United Gulf Bank (BSC) EC	2008	62.94	28.42	3.87	14.87
406	United Gulf Bank (BSC) EC	2009	51.32	24.14	4.07	14.68
407	United Gulf Bank (BSC) EC	2010	55.96	31.34	4.46	14.47
408	United Gulf Bank (BSC) EC	2011	66.18	34.07	8.80	14.39
409	Bank Maskan	2006	10.63	5.32	0.67	17.09
410	Bank Maskan	2007	16.53	5.96	0.51	16.76
411	Bank Maskan	2008	8.30	5.87	0.41	16.78
412	Bank Maskan	2009	8.98	5.09	0.24	17.01
413	Bank Maskan	2010	8.71	4.38	0.11	17.57
414	Bank Mellat	2002	59.94	9.87	2.72	16.18
415	Bank Mellat	2003	69.57	10.05	2.25	16.29
416	Bank Mellat	2004	48.03	9.20	1.98	16.55
417	Bank Mellat	2005	53.48	8.75	1.62	16.94
418	Bank Mellat	2006	56.47	8.92	1.57	17.13
419	Bank Mellat	2007	58.28	8.04	1.13	17.45
420	Bank Mellat	2008	55.45	8.67	1.37	17.62
421	Bank Mellat	2009	50.11	10.35	1.97	17.80
422	Bank Mellat	2010	52.35	11.37	2.61	17.87
423	Bank Saderat Iran	2000	61.74	3.21	6.01	17.36
424	Bank Saderat Iran	2001	70.49	3.61	6.24	15.99

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
425	Bank Saderat Iran	2002	59.88	6.06	4.90	16.60
426	Bank Saderat Iran	2003	58.70	6.68	7.17	16.72
427	Bank Saderat Iran	2004	42.35	8.15	5.65	16.87
428	Bank Saderat Iran	2005	56.48	11.93	6.12	17.14
429	Bank Saderat Iran	2006	32.29	9.47	6.24	17.36
430	Bank Saderat Iran	2007	20.81	7.81	4.90	17.55
431	Bank Saderat Iran	2008	19.19	6.74	7.17	17.54
432	Bank Saderat Iran	2009	18.20	5.63	5.65	17.69
433	Bank Saderat Iran	2010	20.47	5.74	6.12	17.81
434	Bank Sarmaye	2006	32.87	37.84	4.53	13.37
435	Bank Sarmaye	2007	29.05	34.21	5.43	14.08
436	Bank Sarmaye	2008	21.90	17.57	2.38	14.69
437	Bank Sarmaye	2009	16.21	14.22	6.62	14.96
438	Bank Sarmaye	2010	11.90	11.62	7.28	15.19
439	Bank Sepah	2000	37.53	3.51	2.28	16.71
440	Bank Sepah	2001	36.57	3.18	2.69	15.40
441	Bank Sepah	2002	45.63	5.03	2.49	15.87
442	Bank Sepah	2003	40.34	5.28	1.05	16.10
443	Bank Sepah	2004	35.67	11.38	0.07	16.48
444	Bank Sepah	2005	35.07	9.12	3.90	16.63
445	Bank Sepah	2006	25.70	6.65	4.46	16.96
446	Bank Sepah	2007	16.92	6.08	5.76	17.04
447	Bank Sepah	2008	14.48	6.53	7.79	16.91
448	Bank Sepah	2009	25.84	5.81	3.39	16.92
449	Bank Sepah	2010	23.03	4.96	3.15	17.03
450	Bank Tejarat	2000	62.26	3.32	0.12	16.93
451	Bank Tejarat	2001	58.35	2.55	0.16	15.69
452	Bank Tejarat	2002	55.99	2.57	0.27	16.21
453	Bank Tejarat	2003	63.43	3.01	0.30	16.42
454	Bank Tejarat	2004	49.34	9.07	0.11	16.78
455	Bank Tejarat	2005	45.19	7.60	0.09	16.92
456	Bank Tejarat	2006	26.78	5.37	1.00	17.08
457	Bank Tejarat	2007	24.67	5.74	0.22	17.28
458	Bank Tejarat	2008	23.15	5.62	0.16	17.36
459	Bank Tejarat	2009	19.94	5.76	1.36	17.46
460	Bank Tejarat	2010	20.69	5.69	1.50	17.61
461	Karafarin Bank	2006	12.33	10.69	3.37	15.09
462	Karafarin Bank	2007	8.17	7.89	2.79	14.86
463	Karafarin Bank	2008	10.97	9.98	3.23	15.09
464	Karafarin Bank	2009	12.66	11.04	3.74	15.14
465	Karafarin Bank	2010	17.52	13.87	3.73	15.23
466	Parsian Bank	2000	27.25	27.00	1.42	10.76
467	Parsian Bank	2001	35.16	20.11	1.65	12.30
468	Parsian Bank	2002	22.81	5.12	1.85	13.79

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
469	Parsian Bank	2003	19.02	7.47	1.98	15.08
470	Parsian Bank	2004	20.34	7.16	2.00	16.00
471	Parsian Bank	2005	22.58	6.60	2.19	16.35
472	Parsian Bank	2006	12.44	6.45	2.93	16.67
473	Parsian Bank	2007	14.01	6.71	3.77	16.78
474	Parsian Bank	2008	15.71	7.06	4.27	16.89
475	Parsian Bank	2009	16.64	7.60	4.83	17.05
476	Al-Bilad Islamic Bank for Investments & Financing	2007	87.94	17.48	0.00	11.83
477	Al-Bilad Islamic Bank for Investments & Financing	2008	121.60	10.09	0.00	13.07
478	Al-Bilad Islamic Bank for Investments & Financing	2009	77.62	16.03	0.00	13.34
479	Al-Bilad Islamic Bank for Investments & Financing	2010	65.81	19.90	0.00	13.16
480	Al-Bilad Islamic Bank for Investments & Financing	2011	47.17	32.67	0.00	13.02
481	Bank of Baghdad	2005	68.58	17.58	0.00	12.27
482	Bank of Baghdad	2006	79.54	17.96	0.00	12.43
483	Bank of Baghdad	2007	65.13	20.92	0.00	12.61
484	Bank of Baghdad	2008	35.46	17.19	0.00	13.05
485	Bank of Baghdad	2009	51.93	13.61	0.00	13.44
486	Bank of Baghdad	2010	71.06	12.36	0.00	13.62
487	Bank of Baghdad	2011	65.99	15.95	0.00	13.53
488	Dijlah & Furat Bank for Development and Investment	2006	152.87	78.65	0.00	10.09
489	Dijlah & Furat Bank for Development and Investment	2007	94.42	56.54	0.00	10.52
490	Dijlah & Furat Bank for Development and Investment	2008	89.69	42.15	0.00	11.53
491	Dijlah & Furat Bank for Development and Investment	2009	50.42	35.27	0.00	11.81
492	Dijlah & Furat Bank for Development and Investment	2010	117.17	27.14	0.00	12.04
493	Dijlah & Furat Bank for Development and Investment	2011	38.46	20.99	0.00	12.36
494	Investment Bank of Iraq SA Co	2005	55.21	22.14	0.00	11.44
495	Investment Bank of Iraq SA Co	2006	96.17	18.59	0.00	11.75
496	Investment Bank of Iraq SA Co	2007	130.73	29.71	0.00	11.59
497	Investment Bank of Iraq SA Co	2008	136.40	29.74	0.00	11.81
498	Investment Bank of Iraq SA Co	2009	129.84	32.66	0.00	12.01
499	Investment Bank of Iraq SA Co	2010	107.52	35.94	0.00	12.26
500	Investment Bank of Iraq SA Co	2011	83.23	35.73	0.00	12.54
501	Kurdistan International Bank for Investment and Development	2005	160.81	52.26	0.00	10.62
502	Kurdistan International Bank for Investment and Development	2006	154.48	40.77	0.00	11.44
503	Kurdistan International Bank for Investment and Development	2007	160.12	43.24	0.00	11.57
504	Kurdistan International Bank for Investment and Development	2008	131.44	26.41	0.00	12.28
505	Kurdistan International Bank for Investment and Development	2009	125.35	21.95	0.00	12.62
506	National Bank of Iraq	2007	115.48	51.94	18.07	11.42
507	National Bank of Iraq	2008	103.93	44.25	15.29	11.00

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
508	National Bank of Iraq	2009	116.98	52.92	30.99	11.25
509	National Bank of Iraq	2010	93.68	50.28	14.27	11.34
510	National Bank of Iraq	2011	147.34	60.32	11.72	11.88
511	North Bank	2005	99.30	22.21	7.10	10.42
512	North Bank	2006	77.23	32.56	5.78	11.04
513	North Bank	2007	123.00	38.85	6.37	12.42
514	North Bank	2008	106.21	33.98	10.58	12.60
515	North Bank	2009	87.48	25.11	8.76	12.97
516	North Bank	2010	88.84	17.32	5.38	13.53
517	North Bank	2011	81.99	24.13	5.71	13.56
518	Trade Bank of Iraq	2005	125.30	12.45	1.23	13.90
519	Trade Bank of Iraq	2006	101.34	8.34	1.58	14.86
520	Trade Bank of Iraq	2007	93.13	8.01	2.63	15.63
521	Trade Bank of Iraq	2008	94.96	8.15	5.95	16.16
522	Trade Bank of Iraq	2009	90.35	8.87	3.59	16.38
523	Trade Bank of Iraq	2010	88.56	10.09	4.23	16.52
524	United Bank for Investment	2007	90.71	34.18	0.00	12.79
525	United Bank for Investment	2008	135.27	37.90	0.00	10.88
526	United Bank for Investment	2009	120.83	25.62	0.00	12.84
527	United Bank for Investment	2010	67.94	35.48	0.00	13.00
528	United Bank for Investment	2011	38.80	37.73	0.00	13.24
529	Ahli United Bank KSC	2000	70.26	13.65	4.32	15.03
530	Ahli United Bank KSC	2001	65.16	13.70	3.50	15.07
531	Ahli United Bank KSC	2002	49.50	10.70	3.68	15.37
532	Ahli United Bank KSC	2003	45.58	12.02	4.03	15.44
533	Ahli United Bank KSC	2004	54.60	12.11	3.80	15.60
534	Ahli United Bank KSC	2005	54.37	14.05	4.57	15.52
535	Ahli United Bank KSC	2006	49.74	13.32	4.00	15.71
536	Ahli United Bank KSC	2007	38.52	13.55	3.38	15.92
537	Ahli United Bank KSC	2008	27.85	12.16	3.88	15.91
538	Ahli United Bank KSC	2009	26.56	10.50	5.29	15.88
539	Ahli United Bank KSC	2010	33.09	10.81	3.30	15.98
540	Al Ahli Bank of Kuwait (KSC)	2005	40.18	10.86	6.76	15.94
541	Al Ahli Bank of Kuwait (KSC)	2006	33.74	10.78	5.12	16.20
542	Al Ahli Bank of Kuwait (KSC)	2007	25.89	10.29	5.19	16.21
543	Al Ahli Bank of Kuwait (KSC)	2008	30.09	11.14	6.78	16.15
544	Al Ahli Bank of Kuwait (KSC)	2009	13.00	15.89	5.05	16.17
545	Al Ahli Bank of Kuwait (KSC)	2010	12.64	15.94	5.58	16.22
546	Boubyan Bank KSC	2005	134.20	32.54	6.92	13.93
547	Boubyan Bank KSC	2006	102.98	23.88	2.98	14.37
548	Boubyan Bank KSC	2007	72.55	18.70	1.87	14.82
549	Boubyan Bank KSC	2008	36.84	16.36	3.71	14.93
550	Boubyan Bank KSC	2009	30.46	9.24	5.29	15.03
551	Boubyan Bank KSC	2010	34.41	18.24	2.85	15.36

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
552	Boubyan Bank KSC	2011	30.07	15.93	3.27	15.53
553	Burgan Bank SAK	2007	53.06	12.33	2.85	16.16
554	Burgan Bank SAK	2008	45.83	9.78	2.81	16.47
555	Burgan Bank SAK	2009	41.96	10.63	4.95	16.48
556	Burgan Bank SAK	2010	46.77	12.99	4.46	16.51
557	Burgan Bank SAK	2011	49.00	12.43	4.06	16.61
558	Commercial Bank of Kuwait SAK	2000	65.23	11.82	14.53	15.44
559	Commercial Bank of Kuwait SAK	2001	55.59	11.87	11.58	15.52
560	Commercial Bank of Kuwait SAK	2002	43.22	11.44	11.39	15.63
561	Commercial Bank of Kuwait SAK	2003	58.18	13.47	11.81	15.82
562	Commercial Bank of Kuwait SAK	2004	49.10	15.51	13.36	15.64
563	Commercial Bank of Kuwait SAK	2005	55.09	16.05	11.42	15.90
564	Commercial Bank of Kuwait SAK	2006	43.05	16.61	9.76	16.13
565	Commercial Bank of Kuwait SAK	2007	43.44	12.29	7.03	16.57
566	Commercial Bank of Kuwait SAK	2008	34.35	11.55	7.59	16.56
567	Commercial Bank of Kuwait SAK	2009	17.32	12.26	10.99	16.34
568	Commercial Bank of Kuwait SAK	2010	29.44	13.42	9.04	16.37
569	Commercial Bank of Kuwait SAK	2011	34.46	14.31	6.15	16.41
570	Gulf Bank KSC (The)	2000	57.58	10.95	4.89	15.50
571	Gulf Bank KSC (The)	2001	53.55	10.87	4.08	15.63
572	Gulf Bank KSC (The)	2002	54.82	11.11	4.17	15.71
573	Gulf Bank KSC (The)	2003	55.54	10.53	3.95	15.95
574	Gulf Bank KSC (The)	2004	45.79	11.56	3.98	15.86
575	Gulf Bank KSC (The)	2005	39.27	11.64	3.72	16.01
576	Gulf Bank KSC (The)	2006	34.93	9.83	2.78	16.46
577	Gulf Bank KSC (The)	2007	30.89	9.65	2.59	16.74
578	Gulf Bank KSC (The)	2008	17.78	7.68	9.42	16.70
579	Gulf Bank KSC (The)	2009	12.05	8.60	13.77	16.62
580	Gulf Bank KSC (The)	2010	10.27	8.93	6.80	16.61
581	Gulf Bank KSC (The)	2011	10.15	8.99	5.55	16.66
582	Kuwait Finance House	2000	32.78	10.25	8.55	15.71
583	Kuwait Finance House	2001	4.34	10.80	7.61	15.86
584	Kuwait Finance House	2002	7.43	10.99	6.99	15.96
585	Kuwait Finance House	2003	5.47	10.04	5.95	16.15
586	Kuwait Finance House	2004	19.62	10.97	5.81	16.28
587	Kuwait Finance House	2005	23.69	16.11	5.22	16.59
588	Kuwait Finance House	2006	27.34	14.50	4.93	16.90
589	Kuwait Finance House	2007	25.18	16.99	3.34	17.29
590	Kuwait Finance House	2008	20.78	15.16	5.20	17.46
591	Kuwait Finance House	2009	19.97	13.64	5.93	17.49
592	Kuwait Finance House	2010	21.48	12.51	7.36	17.62
593	Kuwait Finance House	2011	20.34	10.92	7.11	17.69
594	Kuwait International Bank	2000	60.82	13.08	5.11	14.57
595	Kuwait International Bank	2001	50.04	14.28	5.89	14.58

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
596	Kuwait International Bank	2002	39.37	16.92	5.29	14.53
597	Kuwait International Bank	2003	37.25	17.59	6.47	14.64
598	Kuwait International Bank	2004	42.66	22.17	6.96	14.73
599	Kuwait International Bank	2005	37.38	20.91	7.15	14.78
600	Kuwait International Bank	2006	43.33	17.73	8.05	14.84
601	Kuwait International Bank	2007	39.04	16.66	6.35	15.06
602	Kuwait International Bank	2008	29.66	15.22	5.30	15.18
603	Kuwait International Bank	2009	29.28	15.19	6.36	15.20
604	Kuwait International Bank	2010	34.84	17.17	6.65	15.22
605	Kuwait International Bank	2011	31.08	18.56	3.85	15.21
606	National Bank of Kuwait S.A.K.	2000	60.65	10.15	6.05	16.41
607	National Bank of Kuwait S.A.K.	2001	69.99	9.77	5.49	16.49
608	National Bank of Kuwait S.A.K.	2002	51.49	10.17	4.13	16.68
609	National Bank of Kuwait S.A.K.	2003	47.64	10.60	3.60	16.73
610	National Bank of Kuwait S.A.K.	2004	38.89	11.77	3.05	16.76
611	National Bank of Kuwait S.A.K.	2005	41.00	12.50	3.08	16.87
612	Bank Dhofar SAOG	2000	16.38	14.62	3.23	13.47
613	Bank Dhofar SAOG	2001	18.00	12.64	3.74	13.68
614	Bank Dhofar SAOG	2002	21.89	13.78	4.69	13.70
615	Bank Dhofar SAOG	2003	17.41	13.33	9.29	14.02
616	Bank Dhofar SAOG	2004	23.56	12.28	6.94	14.18
617	Bank Dhofar SAOG	2005	21.50	12.86	6.01	14.29
618	Bank Dhofar SAOG	2006	22.73	13.43	5.05	14.41
619	Bank Dhofar SAOG	2007	21.57	11.57	6.05	14.73
620	Bank Dhofar SAOG	2008	15.73	14.23	4.71	15.05
621	Bank Dhofar SAOG	2009	18.35	13.52	5.06	15.18
622	Bank Dhofar SAOG	2010	17.29	13.61	5.38	15.28
623	Bank Dhofar SAOG	2011	19.20	11.69	4.93	15.44
624	Bank Muscat SAOG	2000	26.26	7.45	3.03	15.06
625	Bank Muscat SAOG	2001	17.61	9.08	5.36	15.07
626	Bank Muscat SAOG	2002	20.55	8.99	7.37	15.20
627	Bank Muscat SAOG	2003	25.22	9.89	6.58	15.21
628	Bank Muscat SAOG	2004	32.34	10.23	5.60	15.41
629	Bank Muscat SAOG	2005	25.19	14.35	5.56	15.46
630	Bank Muscat SAOG	2006	28.99	10.83	6.07	15.85
631	Bank Muscat SAOG	2007	35.86	14.88	3.89	16.21
632	Bank Muscat SAOG	2008	32.93	11.86	3.26	16.57
633	Bank Muscat SAOG	2009	35.28	12.16	5.28	16.54
634	Bank Muscat SAOG	2010	28.74	13.61	4.44	16.54
635	Bank Muscat SAOG	2011	30.37	12.05	3.53	16.75
636	Bank Sohar SAOG	2007	15.80	11.73	1.45	13.90
637	Bank Sohar SAOG	2008	22.40	11.45	1.52	14.60
638	Bank Sohar SAOG	2009	17.09	10.29	1.59	14.80
639	Bank Sohar SAOG	2010	21.77	9.81	1.87	15.00

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
640	Bank Sohar SAOG	2011	26.61	8.99	2.12	15.13
641	HSBC Bank Oman	2000	28.37	11.46	5.61	14.47
642	HSBC Bank Oman	2001	31.54	12.61	7.76	14.37
643	HSBC Bank Oman	2002	38.95	14.02	7.95	14.33
644	HSBC Bank Oman	2003	38.04	15.89	8.68	14.34
645	HSBC Bank Oman	2004	33.60	14.54	7.82	14.44
646	HSBC Bank Oman	2005	36.12	13.91	7.19	14.57
647	HSBC Bank Oman	2006	47.72	13.63	12.79	14.69
648	HSBC Bank Oman	2007	51.18	14.98	12.43	14.85
649	HSBC Bank Oman	2008	41.27	16.95	9.21	14.79
650	HSBC Bank Oman	2009	41.21	16.46	10.37	14.81
651	HSBC Bank Oman	2010	42.38	14.63	10.84	14.92
652	HSBC Bank Oman	2011	42.89	13.79	4.75	14.99
653	National Bank of Oman (SAOG)	2000	17.23	13.74	6.36	14.57
654	National Bank of Oman (SAOG)	2001	19.51	10.11	9.65	14.72
655	National Bank of Oman (SAOG)	2002	17.51	10.74	12.92	14.66
656	National Bank of Oman (SAOG)	2003	32.25	11.92	23.75	14.57
657	National Bank of Oman (SAOG)	2004	23.35	14.26	24.04	14.44
658	National Bank of Oman (SAOG)	2005	38.45	20.09	12.18	14.59
659	National Bank of Oman (SAOG)	2006	34.36	17.06	8.63	14.85
660	National Bank of Oman (SAOG)	2007	38.89	15.77	5.54	15.16
661	National Bank of Oman (SAOG)	2008	28.65	12.37	4.38	15.46
662	National Bank of Oman (SAOG)	2009	24.82	13.93	4.77	15.36
663	National Bank of Oman (SAOG)	2010	21.36	14.73	4.82	15.36
664	National Bank of Oman (SAOG)	2011	20.89	12.62	3.63	15.57
665	Oman Arab Bank SAOG	2000	18.51	13.90	2.32	13.48
666	Oman Arab Bank SAOG	2001	30.19	12.25	3.47	13.63
667	Oman Arab Bank SAOG	2002	35.58	11.37	3.71	13.76
668	Oman Arab Bank SAOG	2003	35.77	12.31	4.44	13.77
669	Oman Arab Bank SAOG	2004	43.35	13.48	4.70	13.89
670	Oman Arab Bank SAOG	2005	38.69	14.83	4.53	13.90
671	Oman Arab Bank SAOG	2006	42.54	13.56	3.77	14.16
672	Oman Arab Bank SAOG	2007	40.61	13.57	3.40	14.34
673	Oman Arab Bank SAOG	2008	28.50	14.18	2.71	14.52
674	Oman Arab Bank SAOG	2009	33.77	14.73	3.05	14.62
675	Oman Arab Bank SAOG	2010	30.00	14.97	3.22	14.72
676	Oman Arab Bank SAOG	2011	23.38	14.44	3.17	14.88
677	Ahli Bank QSC	2000	54.92	7.01	27.25	13.49
678	Ahli Bank QSC	2001	49.93	9.75	33.52	13.27
679	Ahli Bank QSC	2002	52.91	10.87	38.59	13.29
680	Ahli Bank QSC	2003	54.57	11.92	26.77	13.46
681	Ahli Bank QSC	2004	76.44	19.08	19.97	13.98
682	Ahli Bank QSC	2005	29.82	17.40	8.79	14.35
683	Ahli Bank QSC	2006	23.09	12.37	2.27	14.78

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
684	Ahli Bank QSC	2007	27.92	9.78	1.37	15.27
685	Ahli Bank QSC	2008	33.13	9.22	1.26	15.40
686	Al Khalij Commercial Bank	2007	30.78	27.85	1.73	15.48
687	Al Khalij Commercial Bank	2008	42.20	38.03	0.44	15.00
688	Al Khalij Commercial Bank	2009	31.15	27.58	2.69	15.39
689	Al Khalij Commercial Bank	2010	33.39	25.79	2.18	15.54
690	Al Khalij Commercial Bank	2011	16.39	20.01	1.61	15.82
691	Commercial Bank of Qatar QSC	2000	59.77	10.30	4.32	14.15
692	Commercial Bank of Qatar QSC	2001	52.22	11.76	6.54	14.17
693	Commercial Bank of Qatar QSC	2002	45.46	11.84	6.22	14.34
694	Commercial Bank of Qatar QSC	2003	40.50	16.06	3.68	14.70
695	Commercial Bank of Qatar QSC	2004	47.56	20.25	1.23	15.08
696	Commercial Bank of Qatar QSC	2005	40.25	25.59	0.76	15.62
697	Commercial Bank of Qatar QSC	2006	32.72	18.55	0.80	15.94
698	Commercial Bank of Qatar QSC	2007	36.70	13.72	0.80	16.34
699	Commercial Bank of Qatar QSC	2008	39.49	16.23	0.84	16.64
700	Commercial Bank of Qatar QSC	2009	29.44	20.95	2.21	16.57
701	Commercial Bank of Qatar QSC	2010	30.17	19.99	2.84	16.66
702	Commercial Bank of Qatar QSC	2011	26.34	19.89	1.30	16.79
703	Doha Bank	2000	51.48	8.45	10.99	14.23
704	Doha Bank	2001	28.19	9.65	12.68	14.40
705	Doha Bank	2002	26.19	10.55	14.14	14.53
706	Doha Bank	2003	33.06	12.37	15.87	14.73
707	Doha Bank	2004	30.12	14.12	9.39	14.92
708	Doha Bank	2005	33.56	15.76	5.87	15.25
709	Doha Bank	2006	29.83	12.76	2.47	15.60
710	Doha Bank	2007	29.13	12.04	2.84	15.93
711	Doha Bank	2008	29.69	12.61	2.30	16.19
712	Doha Bank	2009	35.83	12.72	2.70	16.35
713	Doha Bank	2010	31.90	12.78	3.64	16.38
714	Doha Bank	2011	26.14	13.51	2.45	16.48
715	International Bank of Qatar	2001	51.45	10.39	4.04	12.57
716	International Bank of Qatar	2002	43.32	12.63	3.84	12.65
717	International Bank of Qatar	2003	46.41	11.23	3.60	12.81
718	International Bank of Qatar	2004	53.15	19.49	1.13	13.22
719	International Bank of Qatar	2005	35.56	19.36	0.85	14.06
720	International Bank of Qatar	2006	35.72	18.99	0.54	14.43
721	International Bank of Qatar	2007	35.44	16.23	0.20	14.90
722	International Bank of Qatar	2008	37.67	11.57	0.27	15.63
723	International Bank of Qatar	2009	38.28	12.09	0.50	15.66
724	International Bank of Qatar	2010	28.32	12.09	0.97	15.71
725	International Bank of Qatar	2011	21.59	15.25	0.73	15.83
726	Masraf Al Rayan (Q.S.C.)	2007	168.53	43.26	0.00	14.85
727	Masraf Al Rayan (Q.S.C.)	2008	143.19	30.27	0.00	15.34

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
728	Masraf Al Rayan (Q.S.C.)	2009	131.35	24.71	0.05	15.71
729	Masraf Al Rayan (Q.S.C.)	2010	143.08	20.55	0.05	16.07
730	Masraf Al Rayan (Q.S.C.)	2011	122.52	15.39	0.25	16.54
731	Qatar International Islamic Bank	2000	6.86	7.88	1.02	13.26
732	Qatar International Islamic Bank	2001	7.68	7.07	1.44	13.52
733	Qatar International Islamic Bank	2002	51.26	7.62	3.15	13.64
734	Qatar International Islamic Bank	2003	44.01	7.69	3.10	13.89
735	Qatar International Islamic Bank	2004	41.85	8.99	1.65	14.13
736	Qatar International Islamic Bank	2005	48.75	13.93	1.74	14.37
737	Qatar International Islamic Bank	2006	53.73	16.97	1.50	14.65
738	Qatar International Islamic Bank	2007	53.83	23.68	1.52	14.82
739	Qatar International Islamic Bank	2008	25.07	21.65	0.81	15.08
740	Qatar International Islamic Bank	2009	35.04	22.96	0.80	15.33
741	Qatar International Islamic Bank	2010	38.78	21.00	1.06	15.42
742	Qatar International Islamic Bank	2011	32.53	20.95	1.09	15.67
743	Qatar Islamic Bank SAQ	2000	11.18	7.74	3.26	13.92
744	Qatar Islamic Bank SAQ	2001	15.69	7.41	4.46	14.01
745	Qatar Islamic Bank SAQ	2002	46.49	8.59	6.75	14.09
746	Qatar Islamic Bank SAQ	2003	26.38	10.02	5.91	14.25
747	Qatar Islamic Bank SAQ	2004	38.04	19.70	3.88	14.57
748	Qatar Islamic Bank SAQ	2005	24.40	22.54	3.54	14.78
749	Qatar Islamic Bank SAQ	2006	42.95	29.11	3.71	15.22
750	Qatar Islamic Bank SAQ	2007	29.24	22.25	2.36	15.58
751	Qatar Islamic Bank SAQ	2008	26.11	21.97	1.23	16.04
752	Qatar Islamic Bank SAQ	2009	31.72	23.42	1.15	16.19
753	Qatar Islamic Bank SAQ	2010	33.83	17.95	1.22	16.47
754	Qatar Islamic Bank SAQ	2011	21.38	22.05	1.21	16.59
755	Qatar National Bank	2000	51.81	16.13	4.72	15.73
756	Qatar National Bank	2001	34.39	15.14	3.81	15.87
757	Qatar National Bank	2002	37.10	14.53	4.04	15.96
758	Qatar National Bank	2003	28.92	14.55	3.93	16.07
759	Qatar National Bank	2004	12.74	16.90	2.22	16.20
760	Qatar National Bank	2005	25.20	17.40	1.46	16.44
761	Qatar National Bank	2006	24.61	11.80	1.02	16.80
762	Qatar National Bank	2007	35.14	12.12	0.61	17.26
763	Qatar National Bank	2008	23.57	10.95	0.62	17.55
764	Qatar National Bank	2009	23.70	11.14	0.84	17.71
765	Qatar National Bank	2010	29.24	11.10	1.18	17.93
766	Al Rajhi Banking & Investment Corporation-Al Rajhi	2004	15.44	13.08	4.70	16.85
767	Al Rajhi Banking & Investment Corporation-Al Rajhi	2005	14.95	14.17	3.29	17.05
768	Al Rajhi Banking & Investment Corporation-Al Rajhi	2006	38.07	19.18	3.75	17.15
769	Al Rajhi Banking & Investment Corporation-Al Rajhi	2007	33.95	18.90	3.76	17.32
770	Al Rajhi Banking & Investment Corporation-Al Rajhi	2008	38.32	16.55	3.53	17.59

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
771	Al Rajhi Banking & Investment Corporation-Al Rajhi	2009	40.96	16.83	3.60	17.63
772	Al Rajhi Banking & Investment Corporation-Al Rajhi	2010	39.83	16.40	2.70	17.71
773	Al Rajhi Banking & Investment Corporation-Al Rajhi	2011	15.31	14.86	2.47	17.89
774	Alinma Bank	2007	25.60	72.72	0.12	15.68
775	Alinma Bank	2008	12.46	98.93	0.00	15.24
776	Alinma Bank	2009	43.96	90.17	0.00	15.34
777	Alinma Bank	2010	56.46	58.57	0.02	15.78
778	Alinma Bank	2011	21.95	43.21	0.48	16.10
779	Arab Investment Company SAA	2003	32.28	22.61	8.27	14.63
780	Arab Investment Company SAA	2004	29.80	22.98	5.71	14.76
781	Arab Investment Company SAA	2005	39.93	22.35	4.86	14.93
782	Arab Investment Company SAA	2006	36.91	21.71	2.44	15.05
783	Arab Investment Company SAA	2007	46.76	19.39	2.47	15.29
784	Arab Investment Company SAA	2008	56.74	20.61	3.96	15.11
785	Arab Investment Company SAA	2009	60.91	33.54	6.47	14.77
786	Arab Investment Company SAA	2010	73.63	41.43	9.58	14.61
787	Arab Investment Company SAA	2011	55.01	42.42	10.28	14.56
788	Arab National Bank	2000	68.18	9.22	9.76	16.12
789	Arab National Bank	2001	69.86	9.29	9.47	16.17
790	Arab National Bank	2002	69.58	8.82	9.86	16.29
791	Arab National Bank	2003	20.43	8.93	7.43	16.39
792	Arab National Bank	2004	21.01	7.85	5.36	16.64
793	Arab National Bank	2005	11.24	9.39	4.20	16.71
794	Arab National Bank	2006	12.10	10.23	2.33	16.85
795	Arab National Bank	2007	12.19	11.14	1.79	17.04
796	Arab National Bank	2008	14.67	10.45	1.36	17.29
797	Arab National Bank	2009	18.33	13.13	2.14	17.20
798	Arab National Bank	2010	15.23	13.27	3.21	17.25
799	Arab National Bank	2011	10.72	14.23	3.45	17.26
800	Arab Petroleum Investments Corporation	2003	33.90	33.85	0.64	14.55
801	Arab Petroleum Investments Corporation	2004	33.27	35.10	0.64	14.57
802	Arab Petroleum Investments Corporation	2005	35.82	36.23	0.36	14.67
803	Arab Petroleum Investments Corporation	2006	36.10	34.03	0.33	14.78
804	Arab Petroleum Investments Corporation	2007	27.96	28.56	0.32	15.09
805	Arab Petroleum Investments Corporation	2008	11.88	25.06	0.27	15.09
806	Arab Petroleum Investments Corporation	2009	20.21	24.32	0.26	15.23
807	Arab Petroleum Investments Corporation	2010	20.65	26.46	0.26	15.28
808	Arab Petroleum Investments Corporation	2011	23.48	26.33	0.37	15.35
809	Bank AlBilad	2005	35.60	41.39	2.70	14.44
810	Bank AlBilad	2006	10.52	26.81	0.21	14.92
811	Bank AlBilad	2007	16.33	18.66	0.53	15.31
812	Bank AlBilad	2008	35.25	20.02	1.10	15.27
813	Bank AlBilad	2009	23.99	17.24	3.43	15.35

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
814	Bank AlBilad	2010	31.99	14.70	4.90	15.54
815	Bank AlBilad	2011	47.35	12.32	6.03	15.82
816	Bank Al-Jazira	2000	56.78	12.65	25.10	14.14
817	Bank Al-Jazira	2001	61.39	13.69	28.79	14.13
818	Bank Al-Jazira	2002	63.09	13.84	12.02	14.24
819	Bank Al-Jazira	2003	33.13	10.26	4.29	14.69
820	Bank Al-Jazira	2004	36.90	14.90	4.11	14.87
821	Bank Al-Jazira	2005	41.73	21.02	4.87	15.15
822	Bank Al-Jazira	2006	73.67	27.05	5.38	15.25
823	Bank Al-Jazira	2007	35.78	22.21	3.15	15.57
824	Bank Al-Jazira	2008	30.03	17.22	2.46	15.81
825	Bank Al-Jazira	2009	39.73	15.66	4.87	15.89
826	Bank Al-Jazira	2010	37.80	14.56	5.67	15.99
827	Bank Al-Jazira	2011	29.48	12.69	4.94	16.15
828	Banque Saudi Fransi	2000	61.38	10.41	3.92	16.13
829	Banque Saudi Fransi	2001	61.69	11.37	4.26	16.18
830	Banque Saudi Fransi	2002	59.51	11.49	3.97	16.30
831	Banque Saudi Fransi	2003	15.02	10.27	2.92	16.47
832	Banque Saudi Fransi	2004	11.06	10.18	2.40	16.58
833	Banque Saudi Fransi	2005	10.15	10.64	2.19	16.71
834	Banque Saudi Fransi	2006	16.22	11.82	1.72	16.87
835	Banque Saudi Fransi	2007	18.97	11.26	1.36	17.10
836	Banque Saudi Fransi	2008	11.65	11.18	1.04	17.33
837	Banque Saudi Fransi	2009	16.75	13.06	1.60	17.29
838	Banque Saudi Fransi	2010	13.00	14.63	1.81	17.31
839	Banque Saudi Fransi	2011	17.82	13.99	1.64	17.44
840	National Commercial Bank	2000	60.19	4.07	19.76	17.07
841	National Commercial Bank	2001	61.59	6.06	17.47	17.08
842	National Commercial Bank	2002	64.91	7.85	17.60	17.16
843	National Commercial Bank	2003	48.41	9.62	8.68	17.26
844	National Commercial Bank	2004	42.44	10.56	4.05	17.37
845	National Commercial Bank	2005	11.44	14.84	3.16	17.48
846	National Commercial Bank	2006	13.06	15.41	3.64	17.54
847	National Commercial Bank	2007	21.96	14.19	3.06	17.84
848	National Commercial Bank	2008	18.23	12.41	2.65	17.90
849	National Commercial Bank	2009	15.86	11.99	3.96	18.04
850	National Commercial Bank	2010	13.41	11.64	4.59	18.14
851	National Commercial Bank	2011	10.06	11.82	4.26	18.20
852	Riyad Bank	2000	76.38	14.30	7.83	16.67
853	Riyad Bank	2001	77.12	14.38	7.03	16.70
854	Riyad Bank	2002	72.51	13.76	5.80	16.70
855	Riyad Bank	2003	13.38	13.02	5.06	16.76
856	Riyad Bank	2004	9.12	13.26	3.73	16.80
857	Riyad Bank	2005	7.13	13.69	2.91	16.88

Bank Code	Bank	Year	LATD	EQTA	LLRTL	SIZE
858	Riyad Bank	2006	14.07	12.76	2.75	17.04
859	Riyad Bank	2007	20.32	10.87	2.21	17.29
860	Riyad Bank	2008	9.98	16.09	1.71	17.57
861	Riyad Bank	2009	18.40	16.01	1.63	17.67
862	Riyad Bank	2010	15.58	16.84	2.11	17.65
863	Riyad Bank	2011	11.46	16.67	1.74	17.69
864	Saudi British Bank (The)	2000	69.58	8.32	4.48	16.26
865	Saudi British Bank (The)	2001	68.42	9.44	4.65	16.23
866	Saudi British Bank (The)	2002	62.74	9.99	3.67	16.33
867	Saudi British Bank (The)	2003	6.82	11.30	2.28	16.33
868	Saudi British Bank (The)	2004	20.72	10.21	1.55	16.55
869	Saudi British Bank (The)	2005	14.33	11.37	0.94	16.68
870	Saudi British Bank (The)	2006	17.80	12.18	1.16	16.84
871	Saudi British Bank (The)	2007	22.99	10.62	0.91	17.08
872	Saudi British Bank (The)	2008	12.05	8.84	0.78	17.37
873	Saudi British Bank (The)	2009	17.32	10.29	2.27	17.34
874	Saudi British Bank (The)	2010	17.09	12.10	3.40	17.33
875	Saudi British Bank (The)	2011	18.79	12.38	2.40	17.43
876	Saudi Hollandi Bank	2000	55.10	8.49	3.58	15.56
877	Saudi Hollandi Bank	2001	57.84	8.17	3.66	15.72
878	Saudi Hollandi Bank	2002	59.07	8.56	3.95	15.79
879	Saudi Hollandi Bank	2003	22.44	9.79	3.06	15.83
880	Saudi Hollandi Bank	2004	22.73	9.31	3.01	16.00
881	Saudi Hollandi Bank	2005	13.78	9.19	1.96	16.18
882	Saudi Hollandi Bank	2006	21.73	9.11	2.86	16.34
883	Saudi Hollandi Bank	2007	21.93	9.02	4.13	16.42
884	Saudi Hollandi Bank	2008	6.73	9.30	2.94	16.61
885	Saudi Hollandi Bank	2009	18.82	9.53	5.87	16.57
886	Saudi Hollandi Bank	2010	12.20	11.85	3.20	16.48
887	Saudi Hollandi Bank	2011	14.14	12.87	2.76	16.55
888	Saudi Investment Bank (The)	2000	54.12	14.51	3.50	15.11
889	Saudi Investment Bank (The)	2001	59.14	14.32	5.23	15.22
890	Saudi Investment Bank (The)	2002	61.72	11.87	4.93	15.49
891	Saudi Investment Bank (The)	2003	21.73	12.48	4.45	15.57
892	Saudi Investment Bank (The)	2004	27.10	12.64	4.37	15.85
893	Saudi Investment Bank (The)	2005	24.40	13.41	3.36	16.17
894	Saudi Investment Bank (The)	2006	22.12	14.69	3.62	16.20
895	Saudi Investment Bank (The)	2007	14.82	14.55	3.03	16.34
896	Saudi Investment Bank (The)	2008	19.34	12.33	2.45	16.48
897	Saudi Investment Bank (The)	2009	16.39	14.81	4.04	16.41
898	Saudi Investment Bank (The)	2010	22.52	15.81	6.00	16.44
899	Saudi Investment Bank (The)	2011	27.88	16.47	7.65	16.44