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Estimation of Credit Rating Models: Case Study for MENA Countries and their Commercial Banks

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Estimation of Credit Rating Models: Case Study for MENA Countries and their Commercial Banks

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ABSTRACT

Credit Rating Agencies (CRAs) play a key role in financial markets by helping to reduce informative asymmetry between lenders and investors, on one side, and issuers on the other side, with regard to the creditworthiness of banks or countries. This crucial role has expanded alongside financial globalisation and received an additional boost from Basel II which integrates the ratings of CRAs into the rules for setting weights for credit risk. Ratings adjustment tends to be sticky, lagging behind markets, and often overreact when they do change. This overreaction may have aggravated the recent financial crises, contributing to financial instability and cross-country contagion. Criticism has been especially directed towards the high degree of concentration of the ratings industry. Promotion of competition may require policy action at the international level to encourage the establishment of new agencies and to discover alternative rules or regulatory requirements in order to achieve promising results.

The recent growth of Middle Eastern and North African countries (MENA) and their commercial banking system has increased the need of paying widespread attention to this region of the world. This thesis crucially identifies, and estimates, the robust determinants of credit ratings for MENA countries and their commercial banks, incorporating a set of bank level accounting and financial risk factors, as well as country-specific characteristics, including indicators for regulatory, supervision, legal and economic environments. The research contributes, firstly, to

the theoretical literature on credit ratings industry by reviewing extant methodologies specifically as they apply to banks and sovereign countries. Secondly, it conducts a systematic, cross-country empirical investigation using panel data econometric methodology for the purpose of estimating MENA countries sovereign and bank credit rating models. Thirdly, it provides tangible and statistically significant evidence on the different factors that determines the estimation of credit ratings and influencing bank's risk.

The extant literature reviewed serves as a basis to achieve and develop the research aim, objectives and hypotheses of the thesis. The research then constructs an appropriate panel dataset from different sources, containing bank-level and country-level information for a sample of 108 commercial banks covering 13 MENA countries over the period 2000 - 2012. The methodological framework for estimating credit rating models (linear regression, logit and probit) is also reviewed and the procedures for panel data estimation are implemented using the econometric package STATA (version 13). All relevant data are drawn from public sources including Reuters, Bankscope, IMF and the World Bank.

Using the random effects ordered probit and logit methodologies to estimate both sovereign (country) and bank level credit ratings models for the MENA countries, the evidence shows that real GDP growth, capital requirements, restrictions on banking activities and control of corruption all contribute negatively to the sovereign ratings. Furthermore, internal management and organisational

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requirements is considered as an additional regulatory factor not studied in previous research. The statistically significant and inverse relationship of the latter is considered an important and interesting outcome of MENA countries' sovereign ratings. On the other hand, GDP per capita, investment (as a percentage of GDP), political stability, government effectiveness and the rule of law all reveal significant and positive impact on the sovereign credit ratings.

In general, this research finds that improved macroeconomic conditions are correlated with higher ratings, while greater reserve regulations are correlated with lower ratings. The study also does find the significance of governance and regulatory variables plays a key role into the final credit rating.

With regard to the impact on banks' ratings, the results show that higher return on average assets and equity, larger bank size, more restrictions on bank activities, as well as higher official disciplinary power and higher standards of internal management, will yield higher credit ratings. Apart from having direct and positive impact on banks credit ratings, these variables are important for examining the risk-sharing incentives in MENA countries' banks. In contrast, the estimation results indicate that net interest margin, net loans to deposits, liquid assets to deposits, capital requirements, deposit insurance scheme, liquidity requirements, unemployment rate and government effectiveness have an inverse and negative impact on banks ratings.

In general, this study also finds various financial, macroeconomic, and regulatory effects on banks' credit ratings. To a much lesser extent than government ratings, various macroeconomic variables also helped predict banks' ratings, including real GDP growth and the unemployment rate.

The thesis concludes by arguing that the combined use of financial and non-financial factors for estimating credit ratings models supports the relevant hypotheses examined and adds value to all stakeholders in improving and obtaining a better quality of credit ratings. This study also demonstrates that a diversity of bank-level and country-level factors influence the MENA sovereign and bank ratings differently, implying that policy makers, regulators alongside rating agencies should distinguish the different environmental factors between nations before any judgment and issuance can be model of the ratings. To conclude, there is no study which exclusively investigates credit rating models for the MENA region exploiting the richness of the data and methodology employed, and the current research aims to fill this gap.

Key words: Credit Ratings, Commercial Banks, Financial Ratios, Regulation and Supervision, Macroeconomic, Governance, Logit, Probit, MENA Countries.

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ABBREVIATIONS

ACCREQ   Accounting and Disclosure Requirements
ANN   Artificial Neural Networks
APC   Age Period Cohort
AUDREQ   Auditing Requirements
BCBS   Basel Committee on Banking Supervision
BNN   Back Propagation Neural Networks
CAMELS   Capital, Asset, Management, Earnings, Liquidity and Sensitivity
CAPITAL   Total Capital Ratio
CAPLY   Capital Funds/ Liabilities
CAPREQ   Capital Requirements
CDF   Cumulative Distribution Function
CIPE   Centre for International Private Enterprise
CORR   Control of Corruption
COST   Cost to Income Ratio
CRAs   Credit Rating Agencies
CURRACC   Current Account Balance
DEPOS   Deposit Insurance Scheme
DISCPOW   Official Disciplinary Power of the Supervisory Agency
ENTRY   Entry Into Banking Requirements
EQAS   Equity/ Total Assets
FAME   Financial Analysis Made Easy
FBRs   Fitch's Bank Individual Ratings
GAM   Generalised Additive Model
GAMEED   Generalised Additive Maturation and Exogenous Effects Decomposition
GCC   Gulf Cooperation Council
GDP   Gross Domestic Product
GDPCAP   Gross Domestic Product Per Capita
GNSAV   Gross National Savings
GOVEFF   Government Effectiveness
GOVNDEBT   Government Net Debt
IAIS   International Association of Insurance Supervisors
IMF   International Monetary Fund
INFL   Inflation
INVST   Total Investment
IOSCO   International Organisation of Securities Commissions
KMV   Kealhofer, McQuown and Vasicek
LAW   Rule of Law
LDA   Linear Discriminant Analysis
LGASS   Logarithm of Total Assets
LIQ   Assets/ Deposit Funding
LIQDIV   Liquidity and Diversification Requirements
LOAN   Loan Loss Reserves/ Loan
MANGE   Internal Management and Organisational Requirements
MDA   Multiple Discriminant Analysis
MENA   Middle Eastern and North African
MEV   Maturation Exogenous Vintage
MSE   Mean Squared Error

NLASS	Loan/ Assets
NLDEPOST	Loan/ Deposit Funding
NTM	Net Interest Margin
OLS	Ordinary Least Square
OMP	Ordered Multinomial Probit
POL	Political Stability and Absence of Violence
R&D	Research and Development
REGQ	Regulatory Equality
RESTR	Restrictions on Banks Activities
ROAA	Return on Average Assets
ROAE	Return on Average Equity
RGDPG	Real Gross Domestic Product Growth
S&P's	Standard and Poor's
SVM	Support Vector Machines
UK	United Kingdom
UNEMP	Unemployment Rate
US	United States
VOACC	Voice and Accountability
WB	World Bank

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CHAPTER 1

INTRODUCTION

1.1 Overview

The development of Middle Eastern and North African (MENA) countries is widely regarded as one of the biggest anomalies in the existing economics literature (Dahi and Demir, 2008). The region is renowned for a plethora of economics controversies. The existence of natural resources is not met with adequate levels of employment, growth or general development of the region. Several studies have provided a comparison of the growth pattern of MENA with other regions worldwide. (Makdisi, Fattah and Limam, 2003).

Currently, MENA is one of the youngest regions of the world in terms of the average age of its population (Nabli, 2004). However, despite the increasing levels of education and higher expectations among young groups of the population, the current generation is frequently referred to as the "forgotten generation" (Nabli, 2004). The level of economic development has decreased very rapidly compared to several centuries ago. MENA and specific areas within the region in particular used to attract higher levels of prosperity compared to their counterparts in Europe or Asia (Dahi and Demir, 2008). Furthermore, the current state of a banking system in the region is considered to slow down the economic development of MENA (Page, 2003; Yousef, 2004; Creane *et al.*, 2007). Therefore, MENA countries and their banking

system would greatly benefit from the application and development of credit rating models.

In recent years there have been sophisticated developments in the statistical techniques accompanied by availability of cross-country bank and country-level data which have generated increased interest in developing models to classify financial organisations into various credit rating groups. Additionally, researchers have always been building and updating statistical models to explain financial distress, and to estimate bond and credit ratings.

The International Organization of Securities Commissions (IOSCO) defines credit rating as "*an opinion forecasting the creditworthiness of an entity, a credit commitment, a debt or debt-like security or an issuer of such obligations, expressed using an established and defined ranking system*", (IOSCO, 2004).

This study aims to assess the impact of the economic environment and financial factors on bank's and sovereign credit ratings for MENA countries. In analysing the impact of financial and non-financial factors on the banking sector efficiency, the study could provide useful policy information to obtain a better quality of credit ratings.

The chapter provides an introductory background to the history of credit rating agencies.

1.2 History of Credit Rating Agencies

Over the years credit rating agencies have played a key role in the financial literature and specifically in the study of credit ratings. There are a number of effective players in the credit rating industry, for example, Moody's, Standard and Poor's, Fitch IBCA, Thompson, Duff and Phelps, among others (Bissoondoyal-Bheenick, 2004). Credit Rating Agencies (CRAs) originated in United States (US) in the 19th century. In 1841 the first mercantile credit agency was founded in New York, which assessed the ability of merchants to meet their financial obligations. In 1909 John Moody initiated the securities rating business by rating US railroad bonds and then expanded his business to the rating of utility and industrial bonds.

Other bond rating agencies soon followed, namely Poor's Publishing Company in 1916, Standard Statistics Company in 1922, both merging to Standard and Poor's (S&P's) in 1941, and Fitch Publishing Company in 1924 (Cantor and Packer, 1994). Since then rating agencies have also been established in other countries, yet the three US agencies, Moody's Investor Service, Standard and Poor's (S&P) and Fitch ratings, have traditionally been leading the global rating industry and dominating the market share (Dittrich, 2007).

The two leading US agencies, Moody's Investors Services and Standard and Poor's, assigned ratings on more than fifty sovereigns around the world. They use various macro-economic, social, environmental and political indicators in assessing sovereign credit ratings (Moody's, 1991; Moody's, 1995; Standard and Poor's, 1994).

These agencies first focused on US domestic industrial bond ratings but expanded their activities both product-wise and geographically after several decades. New rating products were developed such as bank loan ratings, bank financial strength ratings, issuer ratings and sovereign ratings. In addition, due to the increasing foreign demand, this led Moody's and S&P's to expand their services to rate European and Japanese domestic bonds. While domestic (non-US) rating agencies now also exist in other countries, both companies then proceeded to opening offices overseas and also acquiring local rating agencies (Dittrich; 2000, 2007). A so-called two-rating norm exists, usually issuers and issues are rated by both S&P and Moody's (Cantor and Packer, 1994; Hunt, 2009).

The responsibility of credit rating agencies is to analyse and evaluate the credit-worthiness of corporate and sovereign issuers of debt securities. Also these agencies are responsible for assessing the credit risk for most banks and organisations around the world, and individual investors as well as regulators have extremely relied on credit ratings provided by these agencies for the object of quality ratings for financial instruments. Kerwer (2001) defined credit rating agencies as information intermediaries between investors and financial instruments since these agencies estimate and provide investors with ratings that describe the credit-worthiness of borrowers.

External rating agencies have been well established since the beginning of last century. Most empirical studies estimating bank or country credit ratings models generally use data on ratings assigned by one (or more) of the above agencies. The process of these agencies is based on quantitative and qualitative assessment

reviewed by a rating committee. In recent times, quantitative statistical models based on publicly available data have been used extensively in estimating credit ratings (Afonso *et al.*, 2007; Pasiouras *et al.*, 2006).

Furthermore, credit rating agencies have different ways and policies in measuring banks and country's ratings. Despite credit risk being an important factor influencing the investor's decision, other factors play a role, too, such as market price and risk preferences (Hunt, 2009). These ratings represent not absolute but relative probabilities of default, higher rated issuers and issues are supposed to be more creditworthy and default less frequently than those with a lower rating (Standard and Poor's, 2009a; Hunt, 2009). The major agencies employ letter based rating scales for long-term debt in measuring credit risk; every rating scale in Moody's has its counterpart in Standard and Poor's and Fitch as illustrated in Table (1.1) below.

Table (1.1): Long-Term Rating Scale for Credit Rating Agencies[1]

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[1] http://www.bis.org/bcbs/qis/qisrating.htm

Generally, the above rating symbols have specific meanings regarding the grade, credit risk and credit quality. For example, an organisation that holds a symbol rating of 'AAA' based on S&P's and Fitch or 'Aaa' based on Moody's ratings denotes the highest rating and will be classified as an investment-grade, having the lowest of potential credit risk and the highest of credit quality. In contrast, an organisation that holds a symbol rating of 'C/D' indicates default and will be classified as a junk-grade, having a default or the highest credit risk with a default or the lowest of credit quality. Fitch IBCA rating agency as well as S&P additionally modifies the ratings from 'AA' to 'CCC' with a minus or plus sign, which allows for an expression of relative standing in the respective rating category (Standard and Poor's, 2009b).

Even though rating agencies have developed a diverse range of rating products, the basic ratings remain issuer and issue credit ratings, encompassing both short-term and long-term ratings. The analysis in this study will focus on the foreign long-term issuer credit ratings assigned by Fitch for MENA banks and by Standard and Poor's for MENA countries. Table (1.2) below demonstrates S&P's definitions of these ratings.

<u>Table (1.2): S&P's Long-Term Issuer Credit Ratings</u>[2]

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[2] (Source: Standard & Poor's, 2009b)

While rating agencies publish their rating methodologies, their precise underlying assumptions and weighting of factors remain undisclosed. Cantor and Mann (2009) believed that although the transparency in rating methodologies which could contribute to mitigate the adverse impact on the market, it never fully eliminates such problem. On the contrary, Holmstrong (2008) classified markets in two categories; markets for liquidity and markets for risk-sharing. He concluded that the transparency in credit ratings does not affect the market liquidity.

However, credit rating agencies take a wide range of factors into consideration in their assessments. These not only concern characteristics of the rated entity itself, but are additionally related to the environment it operates in. Moreover, agencies recognise that financial firms differ from non-financial firms. Accordingly, their rating methodologies take the particular nature of banks into account (Le Bras and Andrews, 2004; Vuong, 2007). First, among financial factors particular weight is laid on asset quality (Shin and Moore, 2003). Second, the banking environment is attributed a key role for the operations and performance of banks (Le Bras and Andrews, 2004; Standard and Poor's, 2004b).

1.3 Overall Aim and Specific Objectives

Any specific research requires planning through the identification of the research aim and objectives which extend hypothesis model approach that brings individual and combined responsibilities from social and psychological perspective (Cameron and Price, 2009).

Grunert, Norden and Weber (2005) explored the role of non-financial factors in internal credit ratings and found that the combined use of financial and non-financial factors leads to a more accurate prediction of future default events than the single use of each of these factors. Therefore, this study is aiming to combine the use of financial factors and non-financial factors to estimate credit rating models for MENA countries and their commercial banks. The combination of both factors will give an accurate picture of MENA bank's credit risk assessment.

Specifically, the aim of this research is to estimate credit rating models (linear regression, logit and probit) for MENA countries and their commercial banks over the period (2000 – 2012), incorporating a set of bank-level accounting and financial risk characteristics, as well as country-level indicators, including regulatory, supervision, economic environments and the worldwide aggregate governance. The specific objectives are:

- Objective (1): Undertake a critical review of extant methodologies and evidence on credit rating models, specifically as they apply to banks and sovereign countries.
- Objective (2): Conduct empirical analysis using panel data methodology for estimating bank and country credit rating models for MENA countries.
- Objective (3): Analyse the policy implications with regard to the risk-sharing incentives for MENA countries' banks through an informed analysis of the significant factors affecting their credit ratings.

Thus, to achieve the above objectives, three general hypotheses are emerged from the literature review to be tested in the analysis of this research. The hypotheses are stated as follows:

- Bank-level accounting/financial ratios have a statistically significant influence on MENA country banks' credit ratings.

- Country-level indicators for regulatory, legal and economic environments have a statistically significant influence on MENA country banks credit ratings.

- Country-level indicators for regulatory, legal and economic environments have a statistically significant influence on MENA countries aggregate credit ratings.

1.4 Research Methodology

The methodological framework is designed to apply panel data econometric methodology, using ordinary least square, random effects ordered probit and random effects ordered logit for the purpose of estimating credit rating models for a set of MENA countries and banks. In particular, the object is to consistently identify robust determinants of credit ratings incorporating, where appropriate, a set of bank-level accounting/financial ratios and country-level indicators for regulatory, legal and economic environments, which has not been undertaken before in a separate study for this region, and to assess the risk-shifting incentives of these countries' banks through an informed analysis of the significant factors that identified.

The appropriate methodological framework for panel data estimation with limited dependent variable is examined by Afonso *et al.* (2007), and their setting allows for modelling unobserved country-specific effects that are correlated with the random error term, thus avoiding the use of more complicated instrumental variable estimation. Their estimation procedure is implemented in the econometric package STATA. Similar statistical package which essentially requires input of quantitative data will be utilised for the empirical analysis.

In this study, a comprehensive datasets were collected for the available of MENA countries and banks over the period (2000 – 2012). The Bank-level variables represent the bank size and financial ratios, including profitability, capital strength liquidity and asset quality. The country-level variables represent macro-economic influences such as inflation and GDP, as well as regulatory, supervision and governance indicators. The majority of data are collected from several sources, these are; Central Banks of MENA countries, Bankscope database for bank-level financial ratios, Reuter's database for the country and bank level credit ratings, and the International Monetary Fund (IMF) with the World Bank (WB) databases for country-level data.

More specifically bank level accounting and financial data was drawn from Bankscope database, as used by Pasiouras *et al.* (2006). Their dataset for 12 MENA countries' commercial banks and relevant country level regulatory variables is the starting point for this study, and this dataset will be extended with additional regulatory and governance indicators available from the World Bank (Barth *et al.*, 2001; Kaufmann *et al.*, 2006). Also, Bankscope and other sources (Reuters) will

provide additional commercial bank level data and the credit ratings for MENA countries and their commercial banks. Hence, for the empirical analysis, the researcher has undertaken an extensive manual task of scaling the Fitch (for banks) and Standard and Poor's (for countries) foreign long-term issuer rating information available in qualitative form by scaling it appropriately in quantitative form. This is done by linear transformation of these qualitative symbol data, so as to be suitable for both ordered logit, ordered probit and linear estimation. The rationale behind studying credit ratings and using the transformation scaling procedures are explained in chapter (5) for MENA countries and chapter (6) for MENA banks. Moreover, Islamic banks operating under "Sharia law" will be recognised from Bankscope and the central banks of each of the MENA countries, and will also be distinguished from others using the dummy variable approach.

1.5 Importance of the Study

1.5.1 The Pivotal Role of Credit Ratings

Credit rating agencies act as information intermediaries. There are different functions of credit ratings; firstly, it can be used as a technology tool to alleviate asymmetric information problems between borrowers and lenders. Secondly, it also can attract investors with useful information at a low cost and allow them to take a calculated amount of risk. In other words, credit ratings can encourage investors to invest in corporate securities and get the potential of high return investments. Thirdly, credit ratings can improve and enhance the company's brand image or market image, so when companies have high credit ratings, then they can enter the market strongly with high confidence, and this will enable them to raise funds at cheaper rates. This means that credit ratings have gained in importance as a regulatory tool, so fair use

of these ratings will raise, motivate and strengthen the financial market and the economic growth as a whole (Kumar and Bhattacharya, 2006).

Furthermore, Bank of England (2007) affirmed that CRAs help avoid asymmetric information problem in capital markets between companies and investors and ratings could deal with the problem of collective action between dispersed investors. Fridson (1999) had a similar viewpoint. He argued that these agencies help investors "pierce the fog of asymmetric information from issuers". Ultimately, credit ratings are incorporated into the financial system, and have become an essential feature of financial intermediaries. As a result, numerous pieces of research study the credit ratings and credit agencies.

In general views according to Partnoy (2006), in the US legal context ratings are pivotal factors and it allows CRAs to be protected from civil and criminal liability. Moreover, Partnoy (2006) was inclined to think that CRAs are likely to be "gate openers" for both issuers and investors as it delivers sufficient and transparent information and reflects a clear picture of the firm's position. However, Cantor and Mann (2009) brought opinion that credit ratings are stable than "point-in-time" ratings. The characteristics "point-in-time" is temporary and based on short-term ratings; it also could skip some potential risk factors that can enhance the decision making for investments. Joint Forum[3] (2009) pointed out five main purposes of credit

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[3] The Joint Forum was established in 1996 under the aegis of the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS) to deal with issues common to the banking, securities and insurance sectors, including the regulation of financial conglomerates. The Joint Forum is comprised of an equal number of senior bank, insurance and securities supervisors representing each supervisory constituency. The Joint Forum (2009) received a total of 17 surveys from member authorities, representing 26 separate agencies from 12 different countries and five response describing international frameworks.

ratings including; determining capital requirement, identifying or classifying assets, providing credible evaluation of credit risk, determining disclosure requirements and prospectus eligibility. Such above targets re-confirmed the inevitable role of credit ratings in the financial market. Fridson (1999) noted that competent in the financial markets have enough knowledge to obtain the understanding of credit ratings but there are some less knowledgeable participants who are not specialised in finance need to understand the concept of these ratings as an insurance to avoid errant behaviour of their issuers.

However, regarding the impact of credit ratings on financial markets and security prices, Cantor and Mann (2009) pointed out that rating downgrades could bring systemic effect to financial markets. Moreover, they also provided that there are two cases of credit ratings that could significantly affect security prices; firstly, the change of rating creates significant information about fundamental credit risk. Secondly, even without bringing new information, issuers can be penalised, for example, it is difficult for issuers to have access on credit. Similarly, Jewell and Livingston (1999) also assumed that the changes of ratings provide important information about the financial markets and security prices. In addition, Brunnemeier (2008) considered the systemic risk of ratings. He indicated that the downgrade of monoline insurers could lead to the downgrade of hundreds of insurance bonds and other products.

The role of credit ratings was also confirmed by Gorton (2008), he assumed that one of the significant factors leading to crisis is lack of credit information between parties and thus, sufficient information of credit ratings are useful tool to solve such problem. Freixas and Shapiro (2009), Bolton *et al.* (2012), Mathis *et al.* (2008), Pagano and

Volpin (2008), Skreta and Veldkamp (2008) and Benmelech and Dlugosz (2010) present evidence that ratings (issuers choose CRAs to get the highest rating) plays a significant role in the financial crisis. Peyrache and Quesada (2009) also presented their point of view about shopping for good ratings. They ascertained that the competition between CRAs could facilitate for issuers to suppress their ratings. With a different opinion, Figlewski and White (1995) and Jorion (1995) assumed that such moral hazard in CRAs is not widespread because the purpose of these agencies is to protect their reputations.

1.5.2 Rationale for Studying Credit Ratings

The business of predicting credit ratings for banks and countries is generally very costly and normally done by international rating agencies (Huang *et al.*, 2004). Credit rating agencies such as; Moody's and Standard and Poor's invest a huge time along with hundreds of employees from different departments for the purpose of making deep analysis for firms in order to predict credit ratings to satisfy the market's needs, and to provide investors with comprehensive information, as they require these assessments and credit risk that reflects the real picture of firm's (Huang *et al.*, 2004). However, because of the need in utilising employees' skills for predicting credit ratings and because of the huge cost that involves in this situation, not all rating agencies or specific companies are able to update their ratings on a yearly basis, and if they are able to do so, they still not able to cover the required expenses of doing this job satisfactorily.

Additionally, recent studies show evidence of differences in measuring rating scales across agencies, for example, an issuer which is being evaluated as high ratings by

Fitch, Duff and Phelp's credit agencies, is also being evaluated as low ratings by Moody's and Standard and Poor's agencies. On the other hand, different studies such as (Cantor and Packer, 1996; Ammer and Packer, 2000) found similarities in estimating ratings by Moody's and Standard and Poor's which have been issued for investment grade ratings. However, the changes in ratings are happening due to the fact that some credit agencies have included different variables in the estimation process than other agencies when they rate an issuer. Consequently, this study is therefore valuable and important to the practitioners, academicians, investors and the market itself on one side, also to the international agencies on the other side in order for them to re-evaluate and consider more effective explanatory variables to be included into their assessments for the prediction of ratings in the future.

Doumpos and Pasiouras (2005) stated that researchers along with practitioners have constructed studies on the credit rating industry. The majority of these studies have focused on three different areas; external ratings of the large agencies by (Moody's, Standard and Poor's and Fitch), bonds (Kaplan and Urwitz, 1979; Belkaoui, 1983; Kim, 1993) and commercial papers (Peavy and Edgar, 1984; Chandy and Duett, 1990). However, not as much attention has been given to extend some models in estimating and explaining the risk estimates of specialised and regional agencies (Laitinen, 1999), which this could be as a research gap within the literature review.

1.5.3 Rationale for Studying Banks in MENA Region

MENA is an economically diverse region that covers both the oil-rich economies in the Gulf such as Saudi Arabia, Kuwait and Qatar and countries that are resource-

scarce in relation to population, such as Egypt, Morocco and Yemen. Each of these countries has a long and rich history as well as strong individual characteristics.

Different organisations define MENA as consisting of different territories (Dumper, Michael, Stanley and Bruce, 2007). According to the World Bank, there are 21 MENA countries[4], however in April 2013, the International Monetary Fund created new analytical definitions of MENA; these are called MENAP including Pakistan and MENAT including Turkey. These terms MENAP as well as MENAT have become widely used by businesses to formally consider in the list of MENA region (IMF, 2013).

The empirical analysis in this study will involve 13 countries depending on credit ratings data that is extracted from Thomson Reuters Eikon Database. Countries such as; Algeria, Djibouti, the Islamic Republic of Iran, Iraq, Libya, Malta, Syrian Arab Republic, United Arab Emirates, West Bank and Gaza, and Yemen have been excluded from this study, due to the unavailability of credit ratings data. We use data for a period as 13 years because of the limitations of available data, which means that study conclusions may be affected by the economic conditions of this period.

The banking sector has been selected because it is an interactive environment, with dynamic changes and aggressive forces, such as competition. Besides, recent financial crises in the world have highlighted that banks may experience major

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[4] The MENA region as identified by the World Bank Database covers Algeria, Bahrain, Djibouti, Egypt, the Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, West Bank and Gaza, and Yemen.

problems which cause a potential threat to all stakeholders of the industry and lead some countries unpleasant and suffer with their economy. For example, Anzoategui, Peria and Rocha (2010) revealed that the competition within banking sector in MENA region is lagging behind other regions in the world. They suggest that the reason behind this is due to the poor credit information environment and low market contestability in the region, leading to a further threat on the banks safety and soundness. Furthermore, Elkhoury (2008) stated that the overreactions in credit ratings are known to have exaggerated the financial crises in the past and thus have contributed to financial instability. These overreactions can also be magnified by the current poor level of credit information that is present in the region.

Due to the lack of competition between commercial banks within MENA countries and the lack of existing research that investigates the impact of bank-level and country-level factors on banks' credit ratings in MENA region, this study is constructed to concentrate on those countries by re-evaluating the banking sector as a whole, and by estimating sovereign and banks credit rating models. Therefore, developing models that could predict the importance of factors on credit ratings of countries as well as commercial banks seem more important than ever to be investigated.

The existing body of knowledge on the banks' performance seems to be very fragmented with authors focusing on particular elements of the operations. For example, a study conducted by Pasiouras, Liadaki and Zopounidis (2008) confirms a direct relationship between technical efficiency and returns of the institutions. Another approach proposed by Gaganis and Pasiouras (2007) focuses on the

accounting and disclosure requirements and their impact on credit analysis. However, as pointed out by Grigorian and Manole (2002), an analysis of multiple functions performed by banks is necessary for a full assessment of their operations.

Furthermore, the performance of commercial banks can be linked to wider implications including the economic growth and as such, the banking sector has attracted a significant amount of attention from academics (Grigorian and Manole, 2002). The current state of banking sector is characterised by increasing deregulation and technological change yielding rapid innovations; however, the extent of these processes varies markedly between different regions. The current stage of development and financial performance of the MENA region will be discussed in the next chapter.

The banking sector in the MENA region is of particular interest to academics due to its unique nature. High concentration of the institutions combined with high market share of state banks is characteristic for the countries in the region. The study of commercial banks in this region is therefore to provide practical implications not only for investors and creditors but also to policy makers in order to maximise the effectiveness of the financial system and thus promote the economic growth in the countries.

1.5.4 Contribution of the Study

The literature that examines the impact of financial bank characteristics as well as non-financial indicators such as; country economic, aggregate governance and regulatory and supervision on banks' credit ratings is in general limited. After

reviewing the existing literature, there is no study that been utilised the above variables to estimate sovereign and banks credit rating models especially for MENA region alone. Therefore, this research represents an advance on the current literature in the following respects:

Firstly, it undertakes a cross-country analysis of 108 commercial banks from 13 MENA countries over the period 2000-2012. No previous research on credit rating models for MENA countries has undertaken this comprehensive coverage. Furthermore, the data coverage for this study is most up-to-date.

Secondly, the empirical analysis incorporates a comprehensive set of bank-level financial information as well as country-level economic data. The unique aspect of this study is the associated development of both bank and country based credit rating models for the MENA countries.

Finally, while the research makes use of established econometric techniques (linear regression, logit and probit) commonly used in the estimation of credit rating models, the study is focussed on identifying a set of cross-sectional determinants influencing both bank and country credit ratings. To this effect, the study extends previous research at cross-country level by incorporating the influence of both regulatory and the world aggregate governance indicators on credit ratings for the MENA countries and their commercial banks.

1.6 Outline of the Study

This chapter has provided a comprehensive background to understand the research area, leading to the formulation of the objectives that will serve the general aim of the research; it also presented a brief discussion on the methodological framework and the data sources. Besides, it has sought to justify why this research has been undertaken to estimate the credit rating models for MENA countries and their commercial banks, and how the current work is expected to contribute to the existing body of knowledge regarding the literature review and methodology.

The remainder of the thesis is organised as follows; the second chapter includes two main parts, the first part overviews the history and development of MENA region and its economy, specifically it concentrates on issues such as; governance, regulations and structure reforms that are placed within MENA countries. This part also outlines the performance and competition of banks that operate under this region. The second part of this chapter reviews existing literature concerning the banking stability and risk-taking incentives. In particular, it investigates the impact of factors such as; bank's characteristics, market structure, macro-economic, political and legal environment on the risk-taking incentives as well as stability of banks.

The third chapter represents the theoretical literature review relating to the assessment of credit rating agencies as well as credit rating models that could be estimated through the impact of different factors (i.e. efficiency, macro-economic environment, corporate governance, regulation and supervision requirements) on the banks' and sovereigns' credit ratings. Therefore, the literature appears to have two strands of studies; the first strand covers studies that have evaluated and assessed

the role of credit rating agencies, and the second strand reviews empirical studies that have examined and estimated sovereign and banks credit/debt rating models.

The fourth chapter offers an exhaustive coverage of the methodological framework for the estimation of rating models. This chapter initially discusses the related research methods (e.g. stages, approaches, validity and reliability) and identifies the dependent with independent variables for sampling the datasets. The next stage in this chapter deals with the data sources and research data collection process; firstly, collecting data for the dependant variable of banks and country's credit rating symbols for MENA region over the period 2000-2012. Secondly, collecting data for the independent variables, this is related to the bank specific financial data and a broad range of country-level variables such as; macro-economic, governance, regulation and supervision. The last stage of this chapter gives explanations about an econometric techniques and the selection estimation models such as; linear regression (e.g. fixed effect, random effect and ordinary least square methods) and logistic regression (e.g. logit and probit methods) specifically as they apply for examining banks and sovereign credit ratings.

Chapter (5) and (6) will present and discuss the empirical analysis of the thesis; this is the prediction of rating models for MENA countries and their commercial banks. Firstly, these chapters will start to construct the preliminary and descriptive analysis on both countries and banks datasets using appropriate testing of the hypotheses using econometric methods. Then, to locate the most significant variables that can be impacted on countries and bank's credit ratings. The datasets concerning

countries and bank's ratings will be analysed employing STATA version 13 computer's software.

In particular, chapter 5 is the first empirical analysis of a detailed examination of country-level data on MENA country's credit ratings. By using multiple linear regression (i.e. ordinary least square method) besides logit and probit methods for a balanced and/or unbalanced sample, this chapter will be a key part to comprehensively test the country level hypothesis for this study, to find out the determinants and relationships between the recognised variables and country's credit ratings, and to discuss the evidence and robustness of the findings.

Chapter 6 is the second empirical analysis to be constructed for the purpose of investigating the impact of bank-level and country-level data on MENA bank's credit ratings. By employing linear and logistic regressions (i.e. ordinary least square, ordered logit and ordered probit models) for a balanced and/or unbalanced sample, this chapter seeks to analyse the key determinants that will influence bank's credit ratings. In doing so, the hypothesis related to this part will be tested and specific objectives of the study will be achieved.

Finally, the seventh chapter concludes the study by providing a summary of the main findings, offering some recommendations to avoid low credit ratings, and suggesting extra issues that could be considered for the estimation of countries and bank's rating models in the further. Besides, this chapter is in charge of discussing the policy implications with regard to the quality use of credit ratings and the risk-shifting

incentives for MENA banks through the significant factors which would be affecting

their credit ratings.

CHAPTER 2

OVERVIEW OF THE FINANCIAL SYSTEM FOR MENA COUNTRIES AND THEIR COMMERCIAL BANKS

2.1 Introduction

The main purpose of this chapter is to give an overview of MENA countries and their commercial banks. Firstly, an introductory section covers the history and development of MENA region and its economy. Secondly, the discussion will move on to outline issues such as; governance, regulations and structure reforms that are placed under MENA countries and their banking sectors. Thirdly, the banking system that operates under this region will be discussed; this section will focus on the bank's performance and competition within MENA countries. Then, this chapter will shed lights on the banking stability, banks risk and the impact of several factors including; bank's characteristics, market structure, macroeconomic, political and legal environment on the risk-taking incentives as well as stability of banks.

The current academic debate revolves mainly around three major topics; these are inward looking economic policies, lack of international integration, low development of financial sectors and lack of human capital development (Dahi and Demir, 2008). History and development of MENA and their commercial banks offers some insight into the current research topic and will be therefore overviewed in this chapter.

The countries in the MENA region have adopted different models of development in 1950s and 60s. The in-efficiencies of these models are becoming more and more apparent and a growing realisation can be found in these countries regarding the need for different development paths in order to achieve the national objectives (Nabli, 2004). Furthermore, the occurrence of large volumes of natural resources, oil in particular, suggests that the region could become a leader in the economic growth again. However, it is the large volume of natural resources that has ultimately led to the region's economic downturn. The whole economies of particular countries and their growth are determined by the fluctuations in oil prices (Dahi and Demir, 2008). For almost four decades now, governments in MENA region have been forced to implement systematic changes in public policies in order to restore macroeconomic stability (Page, 2003). While the structural adjustment programmes supervised by the International Monetary Fund and the World Bank have achieved some success, some of the underlying issues are still present.

The public investment in MENA has been found significantly higher than in other regions (Page, 2003) and no substantial changes have been recorded since the start of the structural adjustment programmes. Furthermore, Page (2003) concluded that the top performing economies in the region were actually reducing the level of worldwide integration. The isolation of MENA countries has been enhanced through the implementation of pervasive restrictions on imports and increasing tariffs (Page, 2003).

The inward looking perspective of MENA countries can be found in particular privatization strategies adopted. The privatization has started substantially later when compared to other world regions; however, the bigger problems arise from its

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low effectiveness. For example, Tunisia has been one of the first countries in MENA to begin privatization efforts. The early momentum of the adopted programme has been however lost and the majority of the privatization projects are still not completed. Moreover, Page (2003) concluded that financial institutions lag even further behind the privatization efforts in other sectors.

The long-term capital necessary for private investment projects is virtually non-existent in MENA (Dahi and Demir, 2008) and thus limits the opportunities for growth. Academics have pointed out the necessity of a substantial reform in the near future (e.g. Yousef, 2004) in order to drive the economic growth of the countries. Furthermore, Yousef (2004) argued that MENA countries should aim for the development of the private sector, integration into the international trade and a lower dependence on oil. While the majority of these studies focus on the need to attract foreign investments, the concept of macro-economic stability and its impact on the economic growth has been emphasized by Jallab, Gbakou and Sandretto (2008). Despite the ongoing debate in the academia, no reforms have resulted in any substantial changes to the above described elements up to this date. According to Cardoso and Levine (1998), the reforms in MENA countries are particularly slow due to medium-nature of the problems and the occurrence of the oil shocks.

It is worth mentioning that particular differences exist in the definition of the region as well as particular differences can be found within the region itself. The lack of a unified definition of MENA has resulted in the fact that various researchers and institutions tend to include particular countries that are not associated with this region in other studies. Two of the most controversial countries appear to be Turkey and

Sudan. While Turkey is often used as a positive example of the region, Sudan seems to be dragging the performance scores down. Particular differences between individual studies therefore need to be acknowledged. Furthermore, individual countries within the region vary significantly which limits the validity of general solutions proposed. Recently, Dahi and Demir (2008) distinguish between five groups of countries in MENA. A very brief comparison of the first group consisting of Bahrain, Kuwait, Oman, Libya, the United Arab Emirates, Qatar and Saudi Arabia, and the last group consisting of Sudan and Yemen demonstrates the limitations associated with studies that consider MENA as a unified block. While the first group consists of oil rich states that import labour, the last group can be characterised by almost no natural resources. Obvious differences can be found in macro-economic indicators such as GDP or income per capita.

Furthermore, Page (2003) made a distinction between the Gulf States and other countries in the study of economic growth, further differences can be found in the study of banks' performance conducted by Farazi, Feyen and Rocha (2011). The latter study differentiated between countries in which state banks play a dominant role and those in which private banks lead financial intermediation. The distinction is very different from the one adopted by Page (2003) and goes even further by suggesting differences between groups of countries based on the role of state banks (negligible/intermediate).

While several common features can be found in the history and development of MENA and their commercial banks, the performance of the region should not be generalised as there may be substantial differences between particular countries.

2.2 Financial Health and Status

As background, the following Table (2.1) inspects four World Development Indicators commonly associated with the financial health of a given country. On the left is the year of the reported IMF indicator. Every other year since 2005 was chosen simply for presentation purposes.

Four indicators are reported. The first is debt forgiveness of reduction. The second is debt service on external debt, long-term. The third is domestic credit provided by the financial sector. The fourth is domestic credit to the private sector as a percentage of GDP. There is some wide variation between these four indicators, which might provide some background insight into the reasons behind ratings differential.

On the first – debt forgiveness or reduction – this measure could capture risk associated with actual default. As indicated, debt forgiveness or reductions do not happen often. For the countries shown, none occurred in 2005. In 2007, Jordan saw $14,000 in debt forgiveness and Pakistan saw $1.3 million. The remaining countries experienced no debt restructuring. Interestingly, the data set comprises only two other instances of debt forgiveness or reduction. These two instances occurred in 2011 in Turkey for $13.6 million and in 2013 in Jordan for $201,000. It would be unsurprising to find debt forgiveness and/or reduction as a significant factor in explaining ratings in that debt forgiveness or reduction represent the actual experience of default probability. In the case of Pakistan, the one occurrence is certainly on the minds of bond market investors.

The second indicator is debt service on external debt, long term. This represents a measure of the debt burden for a given country. The indicator matters in that more highly indebted countries have a higher likelihood of defaulting on their debts. The most debt-laden country of those shown is Turkey at $56 billion in 2013, an increase of about $25 billion since 2005. Pakistan has debt of $4.3 billion, about $2.2 billion above where the amount of debt stood in 2005. Unsurprisingly, given the amount debt expanded across the globe in response to the global financial crisis, the countries shown exhibit large expansions in debt service obligations. It will be interesting to watch how dealing with the massive debt expansion affects the political and ratings landscape in the years ahead.

The third indicator shown is domestic credit provided by the financial sector as a percentage of GDP. As with debt service, this measure varies widely. In 2013, this measure ranges from a low of -8% in Saudi Arabia to 188% in Lebanon. Pakistan comes in closer to the bottom at 49%. This measure provides an indication of how fluid and active the financial sector is at providing credit to the domestic economy.

The fourth measure is domestic credit to the private sector as a percentage of GDP. This measure is presented as a gauge of a given country's indebtedness and its availability to repay such debt. As with the two aforementioned measures, this measure varies widely as well, with a low of 16% in Pakistan and a high of 99% in Lebanon. Interestingly, of the countries shown, Pakistan has the greatest room to expand its debt burden if needs be, with a low debt per GDP, a reasonable amount of credit provided by the financial sector, and very little debt forgiveness or reduction on history.

Table (2.1): Selected World Development Indicators Related to Financial Health

YEAR	Country Name	Indicator Name			
		Debt forgiveness or reduction (current US$)	Debt service on external debt, long-term (TDS, current US$)	Domestic credit provided by financial sector (% of GDP)	Domestic credit to private sector (% of GDP)
2005	Bahrain			42	44
	Egypt, Arab Rep.	0	2,142,667,000	98	51
	Israel			78	90
	Jordan	0	527,591,000	110	88
	Kuwait			62	58
	Lebanon	0	3,458,939,000	181	70
	Morocco	0	2,707,346,000	73	46
	Oman			28	31
	Pakistan	0	2,137,211,000	46	29
	Saudi Arabia			29	35
	Tunisia	0	1,872,590,000	64	58
	Turkey	0	31,045,411,000	46	22
	United Arab Emirates			43	44
2007	Bahrain			48	53
	Egypt, Arab Rep.	0	2,741,706,000	84	46
	Israel			83	93
	Jordan	-14,000	666,234,000	114	92
	Kuwait			69	66
	Lebanon	0	4,508,578,000	185	75
	Morocco	0	3,914,657,000	90	58
	Oman			33	36
	Pakistan	-1,300,000	2,380,986,000	45	28
	Saudi Arabia			16	37
	Tunisia	0	2,330,435,000	64	58
	Turkey	0	42,016,835,000	49	29
	United Arab Emirates			60	56
2009	Bahrain			71	71
	Egypt, Arab Rep.	0	2,828,134,000	75	36
	Israel			81	89
	Jordan	0	579,432,000	105	76
	Kuwait			87	85
	Lebanon	0	4,570,222,000	162	73
	Morocco	0	3,386,937,000	100	65
	Oman			40	47
	Pakistan	0	3,160,287,000	47	23

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	Saudi Arabia			1	46
	Tunisia	0	2,049,917,000	68	62
	Turkey	0	60,077,593,000	65	39
	United Arab Emirates			103	84
2011	Bahrain			72	69
	Egypt, Arab Rep.	0	3,406,889,000	75	31
	Israel				89
	Jordan	0	790,104,000	107	74
	Kuwait			55	62
	Lebanon	0	5,234,085,000	174	90
	Morocco	0	3,193,571,000	111	72
	Oman			33	40
	Pakistan	0	2,448,770,000	43	18
	Saudi Arabia			-4	34
	Tunisia	0	2,583,268,000	83	76
	Turkey	-13,614,000	50,670,397,000	72	53
	United Arab Emirates			84	64
2013	Bahrain			79	69
	Egypt, Arab Rep.	0	3,320,529,000	86	28
	Israel				
	Jordan	-201,000	812,148,000	112	72
	Kuwait				
	Lebanon	0	3,419,382,000	188	99
	Morocco	0	5,012,248,000	116	70
	Oman			36	42
	Pakistan	0	4,275,132,000	49	16
	Saudi Arabia			-8	40
	Tunisia	0	2,370,512,000	83	76
	Turkey	0	56,241,194,000	84	70
	United Arab Emirates				

2.3 Governance, Regulation and Structure Reforms

All of the MENA countries and their respective banking sectors are characterised by a single supervisory body in the form of a central bank (Barth *et al.*, 2002). The topic of regulatory structure in banking industry has attracted a significant amount of attention from the academics; however, the debate has failed to reach any clear conclusions and is still perceived as under-researched (Abrams and Taylor, 2001). The benefits of single regulatory body, usually in the form of a central bank, include

the ability to operate more efficiently, ability to avoid the gaps within complex financial companies (Briault, 1999) and the possession of more power to enforce a disciplinary action (Giddy, 1994). Peek, Rosengren and Tootell (1999) therefore concluded that a system in which the central bank supervises banks is more efficient as it can prevent and mitigate crises. Similar findings have been pointed out in the research conducted by Barth *et al.* (2002) who showed that banks tend to have less non-performing loans in countries where they are supervised by a central bank. On the other hand, the countries with multiple supervisory bodies have been found to have lower capital ratios and higher liquidity risk (Barth *et al.*, 2002). Opposing view has been presented by Goodhart and Schoenmaker (1995) who have linked the supervision by a central bank with the pursuit of overly loose monetary policies and negative effects on the perceptions of the central bank.

Generally, regulations put in place have been linked with both the banks' efficiency and the likelihood of banking crises (Barth, Caprio and Levine, 1999). Despite the fact that a high level of regulation is frequently associated with a lower possibility of crisis, Barth, Caprio and Levine (1998) pointed out that this relationship may actually be reversed in the banking sector. Similar findings have been found by other authors (e.g. Demirguc-Kunt and Detragiache, 2002; Adams and Mehran, 2005). Also, in a different study by Barth, Caprio and Levine (1999), they confirmed the above argument and argued that the existence of tighter restrictions placed on banks' activities, the more inefficient banks become and are subjected to a greater likelihood of a crisis. As a result, the relatively low level of restrictions on the banks' activities may actually strengthen the banks' position (Boyd, Chang and Smith, 1998) rather than result in a crisis. Islamic banks present in MENA are very specific in this

aspect. The very basis of an Islamic bank lies in the bank's investment portfolio that goes beyond the traditional view adopted in Europe and the US (Ali, 2011). Therefore, in line with the existing literature, the banking industry in MENA is supposed to be more efficient due to the looser restrictions placed on securities activities. On the other hand, MENA is characterised by substantial entry barriers which limit competition in the banking sector and as such have a destabilizing effect (Beck, Demirguc-Kunt and Levine, 2003).

Until recently, a vast majority of the businesses in MENA countries were Family Owned Enterprises or State Owned Enterprises (Saidi, 2004; Institute of Directors in Lebanon). While some similarities can be found in the process of financial reforms in particular MENA countries, Naceur, Ben-Khedhiri and Casu (2011) failed to observe similarities in the outcomes of these reforms. The efficiency levels of banks in five studied countries namely; Egypt, Jordan, Morocco, Lebanon and Tunisia were found to differ significantly. The MENA Regional Corporate Governance Working Group report produced by the Centre for International Private Enterprise (CIPE) in 2003 outlines particular differences between countries depending on the level of the sophistication of their financial sectors. Two corporate governance approaches can be found in the form of securities market (e.g. Egypt) and banking (e.g. Lebanon) perspective. According to the CIPE report, Jordan is one of the very few examples of the countries in the region that is currently developing the corporate governance by integrating with the rest of the world. These differences among particular countries were found to translate into the variations in terms of efficiency in the MENA stock markets (Lagoarde-Segot and Lucey, 2008).

Both domestic and foreign private banks operate in the region; however, their importance varies between particular countries. During the last three decades, the role of state banks has declined substantially in most regions world-wide (Farazi, Feyen and Rocha, 2011). Despite this overall trend, some countries especially in the Middle East, North Africa and South Asia can still be characterised by a leading role in financial intermediation taken by the state bank. While the strong presence of state banks has been associated with several advantages including the ability to address market imperfections stemming from information asymmetry, other methods addressing the same issues can be found in the introduction of credit guarantee schemes. Farazi, Feyen and Rocha (2011) went even further and argued that such schemes are actually more effective than the presence of the state banks.

2.4 Banking System of MENA Countries

Banking sectors of MENA countries are very specific in terms of their characteristics of ownership, structure and growth potential (Turk-Ariss, 2009). The dominant position of state banks in MENA has slightly decreased over the last decade and their shares have been taken by both domestic and foreign private banks. The findings of the study conducted by Farazi, Feyen and Rocha (2011) quantify this structural change by comparing total market share of state banks in MENA. In 2001, 41 per cent of the market share was operated by the state banks, while only 33 per cent was operated by the same in 2008. Farazi, Feyen and Rocha (2011) conclude that in some countries including Algeria, Libya and Syria, the state bank still plays a dominant role. Furthermore, the role of state banks is very limited in the last set of countries including Saudi Arabia, Yemen, Bahrain, Jordan, Kuwait, Lebanon and

Oman. While the general trend would suggest a decreasing importance of the state bank, the situation in Gulf countries has been found to be very stagnant. The average market share of state banks in this particular region is fairly stable around 28 per cent (Farazi, Feyen and Rocha, 2011).

Nowadays, state and private both domestic and foreign banks operate in MENA region. The socio-cultural background of the region is dominated by Islamic culture and this aspect has been translated into the banking system of MENA countries as well. While the banks in Europe and other regions of the world operate on the basis of interest charge, this system is inapplicable to Islamic banks since the notion of interest is prohibited in Islam (Ali, 2011). The fundamental difference between Islamic and conventional banks lies in their respective portfolio of activities. Islamic banks tend to be more involved in the depositors' and investors' activities (Ali, 2011). As a result, the interest charge is replaced by other solutions that can be in the form of sharing the profits of the financed project, earning the profits by getting involved in the trade and/or in the form of a fee. While conventional methods dictate that a business owner can get a loan from the bank to purchase raw material and that the bank makes a profit by charging an interest, the Islamic banks would purchase the raw material themselves and consequently sell it to the business owner for a higher price and thus make the profit. Furthermore, the Islamic banks share their profits with their depositors and thus attract the public to the banking system. This incentive is conventionally provided by the notion of interest rate.

The basic Islamic banking instruments are based on partnership agreements. Under the Mudaraba contract bank provides the loan (the rab al mal) and the entrepreneur

(the mudarib) contributes his skills and expertise. Profits are shared according to the ratios agreed in the original contracts, however, any loses are solely attributable to the bank. The entrepreneur has control over the business and manages the day to day operations but major investment decisions, including the investments from other investors need to be approved by the bank. Investors will be approved by the Islamic bank if they are Sharia compliant as the business is considered to be operated by a pool of funds and the disbursement of profits will be generated from that pool, which should be free from the interest based share of the economy. Another not so identical arrangement is the Musharaka contract, which considers bank as one of the investors in the business and the profit/loss will be shared among them. This is recognised in the balance sheet of the banks (investors) and the only difference between the conventional long term loans and Islamic loans and advances is that the rate of return is not fixed in Islamic Instruments and the profit/loss sharing concept applies. All the investors inject a share of capital as well as expertise into the business (Ali, 2011).

The concept of lending money is strictly prohibited in Islam which allows the Islamic lending institutes (Islamic banks) to lend a physical asset to another person but not the money for that. Like the investments in the arrangements described above are considered to be money lending in conventional terms but in Sharia concept it is a share in physical business. It is also important to quote that the trade of derivative instruments and arrangements which derives their values from the value of another thing is not allowed and in fact prohibited in Islam. Murabaha contract is a leasing contract just like leasing in conventional banking. It involves purchase of goods for immediate delivery on deferred payment terms. The arrangement stays the same as

in the usual conventional terms where an asset is bought by the bank and leased to the client who keeps on paying the lease payments along with the interest charge. The interest charge is revised as the Inter Bank Offer Rate is changed (Ali, 2011).

The objective of Islamic finance is not simply to earn profit but to be helpful for the economic benefit of the society such as full employment and growth which is more secure in financial terms as compared to conventional banks. The core of Islamic finance is businesses trading goods and investment in Sharia acceptable enterprises. Making money from money is deemed immoral in Islamic banking and wealth should be generated via trade or investments by institutes which are Sharia compliant and not indulged in any activity which the basic principles of Islam has refrained the Muslim Community. An important characteristic of Islamic Banking is that the financial transactions are based on the sharing of risk and reward between the investor and the entrepreneur.

Riba (interest) is forbidden in Islamic finance and Holy Prophet (P.B.U.H) enforced this ruling. The ban on riba is just an absolute. It is considered a curse on society in Islam. The reasons why it is considered unfair can be reviewed from three different perspectives; for the borrower, riba is inequitable for the borrower when enterprise makes profit which is less than interest payments thus turning his profit into loss which means the Profit Before Interest and Tax in the Statement of Profit and loss of a company is lower than the finance charge which is turning the profit into loss, for the lender riba is iniquitous as in high inflation environments when the profits are likely to be below the rate of inflation, for the economy riba can result in accumulating money for a handful of people and may contribute to instability of the

system and it will create monopolies, opening doors for oppression and fraudulent activities. Briefly, the distribution of wealth and specifically the circulation of money in all tiers of society are affected by the interest based economy ruled by conventional banks. In interest based economy, capital is directed to the borrower with high creditworthiness rather than the borrower who would make the most efficient use of the capital.

Moreover, an agency relationship occurs, when a principal (owner of one thing) hands over the right of usage and/or decision making to the agent (person who is responsible for the usage/decision making of the Principal's resource). This is an underlying relationship which is agreed between the depositors (investor) and the bank (institute) and between the bank (lender) and entrepreneurs (borrowers).

However, in a Sharia compliant bank, the lesser (bank) is the owner of an asset who sells it off to the lessee on a deferred payment model with the price of an asset divided over the term of the lease period. This price will include the profit rate of the bank as well which will not vary, principally. Further, an important practical element to be shared is that in a conventional bank, the ownership of asset is transferred to the lessee with a financial charged created by the bank over the asset whereas in a Sharia complied bank, the ownership of asset rests with the bank and the lesser has the right to use that asset. Upon satisfaction of the terms of the contract the ownership will be transferred to the lesser. Till then, a financial charge over the bank's asset will be created by the lesser. The financial charge refrain the owner to transfer/sell the asset to another party without the consent of the lesser. Similarly,

operating leases (Ijara) where a bank allows the lessee to use his asset against the payment of the rental fee. Bank owns the asset and lends it to the entrepreneur.

Other instruments are Qard, which are like current deposits in the deposit side of the balance sheet treated as liabilities on the bank and saving accounts which participate in the profits of the bank (Ali, 2011). Banks can offer them bonuses on such accounts, which keep their financial interest in the Islamic bank in comparison with the conventional banks. Investment accounts on the other hand are nearly identical to partnership investments discussed above.

Profitability of Islamic bank, on average, is 19% lower than conventional banks. It is mostly due to high expenses incurred by Islamic banks that they suffer from lower profits than conventional banks. In contrast to conventional banks, Islamic banking is more dependent on complex products and interfaces as compliance with Sharia law is subjective in nature and dependent on the Sharia board approval. However, this is not the case with conventional banks where things are interest based and the design is not dependent on religious compliance and norms. Islamic banking finds off shoring tough, deficit scale economies and usually conducts basic technologies while conventional banking abstain from these issues. In a credit cycle, Islamic banks face higher risk costs as their credit processes and portfolio concentration are uncertain as compared to conventional banks that have improved credit process.

Conventional banks have enhanced quality of customer service, their products and distribution range allure most loyal customers while Islamic banks need to advance their quality of customer service and maintain loyal customers. Islamic banks find

themselves in a compressed and hard situation because of the constant need to increase profitability and upgrade their service offering. They are combating these problems by initiating cost and risk transformation programmes in order to attain stability of their cost position and provisions. In comparison with conventional banks, Islamic banks have not worked much into customer cross selling opportunities provided (Nazim and Ibrahim, 2012).

Islamic banks can exhilarate products holdings per customer by forming a targeted and productive cross selling programme. Furthermore, Islamic banks can expand their revenue growth by proposing segmented values to affluent customers with focusing precisely on wealth management. Like conventional banks, Islamic banks will have to convey a segmented offering and they can offer this by deciding their segment propositions, service and relationship model and having a dynamic infrastructure. Many Islamic banks have disadvantaged cost base and a lot of them have launched adequate programmes to help with this disadvantage. Lean banking programme may be used by Islamic banks for end to end process improvement with focus on efficiency mixed with service quality, superior risk management and lead-time improvement. The most common method of segmentation is income bands and banks have organised grouped customers into segments. With introduction to data warehouses, customer profiling and propensity modelling there is an advancement in gathering data and data analysis which has helped Islamic banking to enchant new customers, as well as get close to existing customers.

However, in relation to the empirical literature for the comparison, the fundamental difference between Islamic and conventional banks can be found in their prohibition

from charging or paying of interest (Karim, 2001). In essence, the investors' return in Islamic banks is directly associated with the return on assets financed by the investors' funds (Karim, 2001). Chong and Liu (2009) challenged this theoretical assumption and argued that the profit-and-loss sharing paradigm is not translated into practice. The authors suggested that Islamic and commercial banks are not at all that different. Overall, the study conducted by Chong and Liu (2009) revealed that Islamic deposits are in fact not interest-free but they are closely pegged to the deposits. As a result, the growth of Islamic banking on a global scale can be attributed to the Islamic resurgence worldwide as opposed to the advantages of the banking system.

The empirical study of Islamic and commercial banks and their credit ratings conducted by Cihak and Hesse (2010) concluded mixed results. While small Islamic banks were found to be financially stronger than their commercial counterparts, a contradictory finding was found for large banks. The complexity of comparing Islamic and commercial banks in terms of their credit ratings is further magnified by the non-comparability of the financial statements of Islamic banks as reported by Karim (2001).

An alternative model specifically designed to assess the operational soundness and creditworthiness of the Islamic banks has been developed by Muljawan (2007). The model is based on the CAMELS rating system (capital, asset quality, management, earning, liquidity and sensitivity to market risk) with several adjustments in terms of financial rations and managerial assessment. The key differences relate to the areas of value added distribution and identification of risks not affecting the conventional

banks. In terms of the managerial assessment, the model proposed by Muljawan (2007) builds on the Islamic values, such as adl (positioning of the personnel appropriately according to their competences), masuliyah (accountability in performing the tasks), intaj (high productivity), ihsan and fatanah (professionalism) and iman (clear objective in all levels of the management). Furthermore, Islamic banks are recognised to face a commercial displacement risk stemming from lower yields in comparison to the conventional banks. Muljawan (2007) provided empirical support for his model and concluded its higher efficiency in locating the problems compared to the traditional credit rating models used in the banking industry.

In summary, a general lack of consensus can be found in the academic debate regarding the comparison of Islamic and commercial banks in terms of the bank rating models. While some of the authors suggest that the differences between the two types of the bank are only minor and do not have a significant effect on the validity of credit rating models, a more recent study conducted by Muljawan (2007) proposed a new bank rating model specifically designed to accommodate for the nuances of the Islamic banking system.

2.4.1 Performance of Banks

Two recent studies will be evaluated in a more detail in order to understand the performance of banks. Firstly, Kobeissi and Sun (2010) studied the performance of private and state banks in 17 MENA countries including Iran, Israel, Mauritania and Turkey, suggesting the adoption of a wider definition of MENA. The second study has been conducted by Farazi, Feyen and Rocha (2011) who focused more narrowly on the non-Gulf countries in the region since the distinction between private and state ownership has been expected to be crucial in these countries. Further

differences between the studies can be found in their focus, while Farazi, Feyen and Rocha (2011) used measures of performance to compare the state of ownership, Kobeissi and Sun (2010) used measures of performance for private and state banks. However, as pointed out by Heggestad (1977), profitability can be considered to represent a summary index of performance and thus these two studies arguably focused on the same aspect of the banking sector. The conclusions drawn in both studies are very similar. State banks were found to be significantly outperformed by their private counterparts. Substantial differences have been found in the ratios of operating costs to assets (Farazi, Feyen and Rocha, 2011) and higher returns on assets and equity (Kobeissi and Sun, 2010). These findings have been supported by a number of prior studies (e.g. Micco, Panizza and Yanez; 2004, 2007).

While a state bank has been associated with the potential to contribute to financial and economic progress (Farazi, Feyen and Rocha, 2011), market imperfections lead to their lower profitability and higher costs compared to private banks (Micco, Panizza and Yanez, 2007). One of the crucial aspects affecting the performance of state banks is the presence of extensive political interference (Farazi, Feyen and Rocha, 2011) which have an impact on both credit and employment decisions. In other words, the mandates are very blurred and the governance structure is often found inadequate (Farazi, Feyen and Rocha, 2011). The study conducted by Micco, Panizza and Yanez (2007) pointed out that the gap between state and private banks widens during election years which is in line with the argument regarding extensive political interference. In essence, state banks not only fail to achieve the same level of performance as their private counterparts, their operating costs are much higher decreasing the profitability even further. Moreover, Micco, Panizza and Yanez (2004)

pointed out that state banks usually have larger non-performing loans compared to private banks which only confirm the poor performance of state banks.

Building on the distinction of state and private banks' performance, Micco, Panizza and Yanez (2004) provided a comprehensive analysis of bank ownership and performance based on three categories; these are state banks, private domestic and private foreign banks. Foreign banks have been found to be the most profitable and also to achieve the lowest costs. Similar findings have been concluded in the study conducted by Demirguc-Kunt and Huizinga (1999) with the differences being most substantial in developing countries. Furthermore, Kobeissi and Sun (2010) argued that the presence of foreign banks in the country affects the performance of local banks in a positive way. The basis of the theoretical argument behind this observation can be found in the increased competition and knowledge dissemination. Firstly, the higher level of competition forces local banks, both private and state, to operate more efficiently in order to outperform other rivals. Secondly, the best practices are easily transferred within the region and thus allow the existing institutions to enhance their performance.

2.4.2 Competition between Banks

In line with the argument proposed by Heggestad (1977), market structure affects competition and thus consequently influences bank profitability. Banking sectors in MENA countries are usually highly concentrated, however, their characteristics of ownership, structure and growth potential set them apart from other regions (Turk-Ariss, 2009). Based on the revenue elasticity to input prices, three different market structures have been distinguished by Turk-Ariss (2009) and Isik and Hassan (2002).

The North Africa region shows signs of monopolistic conditions; however, remaining countries are mostly monopolistically competitive in their banking sectors with the exception of Turkey that is of an oligopolistic nature.

To begin with, a monopolistic structure refers to the presence of a single competitor that has a dominant position in the sector and can dictate prices since the consumers cannot switch their provider of the good or service. Monopolistic competition is characterised by a larger number of competing companies, however, this market structure assumes the existence of particular factors that distinguish individual companies, such as branding or product offering. The products offered by different companies are therefore categorised in the same industry but they are not perceived as close substitutes. In other words, the performance of other rivals does not have any substantial effect on the given company. Finally, oligopoly assumes the existence of a low number of major competitors in the market. Due to the limited number of rivals, the competitors' actions can be carefully monitored. The main limitation of this market structure lies in the potential of common agreements among companies. The competition is very limited and collaborative arrangements are often signed supporting the industry as a whole rather than benefiting a single company.

Despite the differences in market structure of the banking sector in particular MENA countries, one major theme can be found in all parts of the region, this is lack of competition. In monopolistic structure, there is no one to compete with. A higher number of competitors in the monopolistic competitive structure would suggest a higher level of rivalry; however, since all companies are perceived very differently,

the products are not viewed as substitutes by the consumers which limit the competition in the market.

Anzoategui, Peria and Rocha (2010) utilised the H-statistic and the Lerner indices in order to compare the banking sector competition on a global scale. The findings indicate that MENA region is substantially lagging behind other regions in terms of banking sector competition. Furthermore, the longitudinal nature of the study also revealed that the competition within banking sector in MENA has not improved in any significant way during recent years. Anzoategui, Peria and Rocha (2010) went even further in their study and aimed to explain the root cause behind the lack of competition in the banking sector in the region. Their findings suggest that the basis for this issue stems from the region's poor credit information environment and low market contestability.

Arguably, an imperfectly competitive banking system can actually lead to a worse result than if the country did not have any banks in the first place (Smith, 1998). While this is hardly the case in MENA, academic consensus seems to revolve around recommendations aiming to support the competition in the banking sector. Building on the proposed advantages of an increased bank competition, such as higher level of income and reduced severity of business cycles (Smith, 1998), an argument raised by Isik and Hassan (2002) to foster the banking competition in the region. Several years later, the same recommendations can be found in the work of Turk-Ariss (2009) which is in line with the lack of improvement observed by Anzoategui, Peria and Rocha (2010).

2.5 Banking Stability and Risk-Taking Incentives

The country's economy relies to a great extent on the banking sector activity and its leading role in their stabilisation. Banks performance and stability will also be influenced by a country's economy, with regards to the banks which function within it. Demirguc-Kunt and Detragiache (1998) carried out an early study on banking crises, observing a weak macro-economic environment to increase banking crises risks. For example, low output growth, high inflation and high real interest rates are in particular related to bank instability. Likewise, Fernandez and Gonzalez (2005) conducted a study, and showed that inflation was associated with higher banking risk in a positive way, whereas GDP per capita was negatively associated with this risk.

The banking sector strives in stabilising the financial system, through regulation and supervision practices, in order to prevent systematic crises overflowing into various other areas of the economy. A multitude of diverse inter-connecting factors impinging on banks can be identified in the regulatory environment. Nowadays, credit rating agencies play a crucial role in the financial markets since they reduce the informative asymmetry by providing information to lenders and creditors about the banks' creditworthiness (Elkhoury, 2008). The lack of specific information that is present in the region can be associated with the low interest among lenders and creditors to invest their money in the region.

The topic of banks risk-taking is closely related to their performance and stability. In general terms, risk-taking behaviour is frequently associated with the opportunity of achieving higher profits but increasing the chance of a failure on the other hand. The risk-taking behaviour can therefore result in better performance indicators, however,

may inhibit the banks' stability and soundness. The economics literature recognises several internal and external factors that affect the extent to which the banks' activities can be regarded as risk-taking.

In addition, there are several factors and features within the banking sector and its environment influence the banks risk and risk-taking incentives. On one side, the risk of banks is significantly determined by bank characteristics that are reflected in their balance sheets. On the other side, a significant aspect regards the political and legal environment (e.g. regulation, supervision and governance) considerably determines the stability of the banking sector in a country and influence the banks risk-taking incentives.

2.5.1 Bank Characteristics

Barth *et al.* (2002) introduced a model of bank stability and soundness based on the CAMELS system. CAMELS stand for Capital adequacy, Asset quality, Management quality, Earnings, Liquidity and Sensitivity to market risk. These elements are most commonly represented by the following ratios:

- Capital adequacy: Ratio of equity capital to assets.
- Asset quality: Ratio of non-performing loans to total loans.
- Management quality: Ratio of overhead costs to assets and non-interest revenues to total revenues.
- Earnings: Ratio of net income to assets and net income to equity.
- Liquidity: Ratio of loans to assets plus the ratio of deposits to assets.

The same study by Barth *et al.* (2002) utilised the above mentioned model in order to predict the effect of supervisory bodies on banks' safety and soundness. Their findings suggest that countries with a single supervisory body in the form of the central bank, such as the MENA countries, score higher in the bank safety and soundness indicators.

Moreover, capital strength within banks is significant and widely recognised, and has accordingly conditional on meeting the regulations which were set up by The Basel II capital framework, to provide international standards for minimum capital requirements in banks. Banks use capital to fender possible losses; therefore capital is valuable characteristic within the banking sector. Capital of satisfactory proportions, function as protection against financial condition and hence banking failure (Barth, Caprio and Levine, 2004). Capital specifically protects depositors and creditors against financial loss, created by shareholders (Ware, 1996).

Banking supervision under the Basel Committee refers to the core of a bank's capital as Tier 1 capital. The fundamental areas within capital in the committee's opinion are equity capital and disclosed reserves. They critically affect profit margins and competitiveness within banks. Accordingly, capital is characterised in two tiers for supervisory reasons. (Tier 1) consists of at least 50% of the bank's capital base, defining the core element i.e. equity capital and published reserves, produced by post-tax retained earnings, where as other capital areas are forwarded to Tier 2 (BIS, 2006).

With regard to the asset quality, it is an important factor for financial firms and vital for assessing bank risk. However, the presence of bad asset quality could be influential on bank's profitability, by a lessening interest in income and an increase in provisioning costs, resulting in a decline of net profits (Pasiouras, Gaganis and Zopounidis, 2006). What is more, a significant determinative factor of the failure of banks, relates to bad asset quality resulting in large amounts of loss being too excessively large for absorption by the capital. It is extremely essential for borrowers of banks to be in a position where they are able to pay back loans (Ware, 1996).

Furthermore, bank's profitability essentially ascertains practicality on a long term basis. Banks in which have strong and flourishing constitutions are able to produce and sustain earnings, capable of providing a source of capital, resulting in strengthened growth, liquidity and protective covering against insolvency, economic and financial condition, providing an increased strong hold to combat untoward states of affairs (Vuong, 2007). However, because of reduced profitability, the vulnerability of banks increases, due to a loss in the ability to raise capital base and practicality (Arena, 2008). Substantial profitability enhances stability within banks.

In addition to the profitability of banks, liquidity is also an important component to bank's viability, i.e. to be in a position to fund any gains in assets, enabling banks to meet required obligations (BIS, 2000). However, Vuong (2007) highlights that banks could receive interruptions in funding sources such as; the running out of deposits. These interruptions can result in unexpected losses in asset sales; therefore the role of liquidity is to protect capital. Obviously any bank that maintains stable liquidity is less at risk than banks with low liquidity.

Besides, corporate governance is another bank characteristic which should be reckoned with. Corporate governance is the system of rules, practices and processes by which a company is directed and controlled. Corporate governance essentially involves many stakeholders in a firm; including its shareholders, management, customers, suppliers, financiers, government and the community. Corporate governance also provides the framework for attaining a company's objectives. There is a primary feature of corporate governance, which is the principal-agent-problem between owners and managers. This could have an impact on bank risk-taking. Saunders, Strock and Travlos (1990) discovered some support to back up the observance that banks where managers grasp a bigger proportion of the banks stock, seem to be inclined to higher risk-taking incentives. Adding to that, Laeven and Levine (2009) results display a trend within banks of an increased risk with more number of powerful owners.

In addition, corporate governance is an important determinant of credit ratings since the rating agencies have a good concern of governance variables. The concern appears when good governance can sustain the financial position of the firm and lower its external financial cost, and also when weak corporate governance can weaken the firm's financial position and higher its financial cost to end up with losses. Evidence on the impact of corporate governance on firm's credit ratings was investigated by Ashbaugh-Skaife, Collins and LaFond (2006), using long-term issuer ratings compiled by Standard and Poor's. They used such variables that mainly include firm characteristics and corporate governance measures. Employing ordered logistic regression, they presented evidence to explain the strength effects of governance attributes on firm's credit ratings and that after controlling the firm-

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specific risk characteristics. Ashbaugh-Skaife *et al.* (2006) also found that firm's credit ratings are positively connected to the weaker shareholder rights in terms of takeover defences, the degree of financial transparency, the overall board independence, the board stock ownership and the board expertise.

However, due to the difficulties in obtaining and accessing data relating to corporate governance, this study will rely on data extracted from the aggregate worldwide governance indicators that contain six dimensions of governance. These indicators are explained in chapters (4 and 5).

Moving forward to the size of banks as another aspect of bank's characteristics, the current academics debate revolves mainly around the impact of size of the bank on its risk-taking behaviour. Two contradictory perspectives can be found in the economics literature.

On one hand, Allen and Gale (2000) argued that a low number of large banks are easier to monitor and thus the corporate control of banks will be more effective and prevent risk-taking behaviour. Moreover, larger banks are expected to achieve higher profits and higher value of the bank which reduce the incentive to engage in risk-taking behaviour (Hellman, Murdock and Stiglitz, 2000). Further, it is larger banks that have stronger establishments than banks of a smaller scale. Larger banks can have increased abilities to handle change, conditions and geographic reach, resulting in decreased risk of concentration. Furthermore, size is connected with economies of scale, consequently larger scale banks have the ability to attain a larger efficiency in operating systems, and more advanced resources needed for fresh investments. Banks with a larger establishment can also be equipped with a

larger market share that could increase franchise values within banks (Moody's Investors Service, 2002 cited in Pagratis and Stringa, 2009).

On the other hand, Alfred Magilton Best Company is a global credit rating agency which argues in (2009) the following view. It is in the belief of the agency that bank size influences on safety, soundness and performance are over estimated. They argue that although the perception is that larger banks are known to be more secure than smaller banks with a capability of featuring larger earnings power, the scale of a bank may not essentially be in any relation to diversification of risk, economies of scale or market power. In addition to this, there is a bigger exposure to risk, and accumulated leverage related with larger scale banks. Likewise, operation with increased leverage which is evoked by diversification is connected with larger banks that can also engage with riskier lending (Demsetz and Strahan, 1997).

Further example regarding the potential of larger banks to engage in risk-taking, Mishkin (1999) pointed out that large banks tend to receive greater net subsidies than smaller banks. The underlying reason can be found in the perception that the large banks are "*too big to fall*" (Mishkin, 1999). Banks crises in larger banks would have major implications for the whole economy and therefore, governments frequently support these banks when they experience difficulties. Example can be made of the UK banking sector following the collapse of the Northern Rock. Based on the "*too big to fall*" argument, Mishkin (1999) argued that the large banks are actually more likely to take excessive risks due to their limited liability. The topic of limited liability has been first introduced by Stiglitz (1972) who emphasized the importance of deposit insurances in order to prevent banks from excessive risk-taking. The debate regarding the impact of size of the bank and its risk-taking

behaviour has failed to reach any clear conclusions. The most conclusive outcome has been presented by Boyd and Runkle (1993) who found an inverse relationship between size and the volatility of asset return, however, failed to find any evidence suggesting that small banks would be more likely to fail.

2.5.2 Market Structure

Another crucial factor affecting the banks risk-taking behaviour is the number of competitors. The MENA region has been associated with a highly concentrated banking sector that can be characterised by monopolistic, monopolistic competitive or oligopolistic market structure depending on the particular country. As a result, the MENA region can be characterised by a low level of competition stemming from the market structure of the banking sector. This environment does not provide any incentive for risk-taking behaviour and thus the economics principles suggest that banks will engage in risk avoiding behaviour which will consequently lead to an increased stability and soundness (Williamson, 1986). The risk avoidance is further supported by the policies adopted by Islamic banks (Ali, 2011). Majority of the investments aims to support the local economy and is frequently pre-agreed which minimizes the risk associated with the transactions.

Furthermore, a relationship has been established between the market structure of a banking sector in the country and their both profitability and stability. Hellman, Murdock and Stiglitz (2000) argued that higher the level of concentration of banking system, the higher the profits are and consequently the lower bank fragility is since the profits act as a buffer preventing the severity of the impact of adverse shocks. Similar findings have been concluded in the study conducted by Allen and Gale

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(2004) who revealed that more concentrated banking sectors with a few large banks are less prone to financial crises. The previous section has outlined the market structure in the MENA region consisting of three types of structures; monopolistic, monopolistic competition and oligopolistic. All of these structures can be regarded to consist of several dominant players and thus the banking sector in MENA countries displays signs of a high concentration. The conclusions drawn by Allen and Gale (2004) have been supported by Beck, Demirguc-Kunt and Levine at the same year (2003). The level of bank concentration is found to have a stabilizing effect and thus diminish the potential for systematic banking crises. In essence, the large banks are better able to diversify their business portfolio and thus avoid crises (Williamson, 1986). The academics and researchers have therefore pointed out the need for establishment of sound institutions and regulatory policies in order to provide an incentive for investors (Gentzoglanis, 2007) and ensure bank stability and soundness.

Beck, Demirguc-Kunt and Levine (2003) argued that countries with a higher level of competition in the economy are less prone to systematic banking crises. However, the prevalence of inward-looking policies minimizes the level of competition, especially in the international perspective and thus poses a threat to the bank safety and soundness.

2.5.3 Political and Legal Environment

The behaviour of risk-taking within banks may be influenced by policies adopted by different countries. However, researches regarding the impact of banking regulation on risk-taking incentives including; performance, stability and soundness have

produced a variation of mixed views.

The stability of banking sector is also supported by political and legal environment, which Fernandez and Gonzalez (2005) concludes from an analysis carried out, which identifies that a poor legal system with improper enforcement rules seems to add risk to banks. Similarly, Barth, Caprio and Levine (2004) discover improved property development rights and greater political openness could relieve the negative relationship between moral hazard evoked by deposit insurance generosity schemes, and bank fragility.

A part of the regulation and supervisory environment of banks is deposit insurance schemes, which aim to accomplish stability within banks. Nevertheless, their affects remain a source of debate. On one hand, deposit insurance is established to secure depositors from failure in banks, and this prevents depositor runs, seemingly increasing bank stability. Alternatively, deposit insurance could also inspire bank risk-taking as this creates hazardous moral situation (Demirguc-Kunt and Detragiache, 2002). Studies carried out by Barth, Caprio and Levine (2004), Demirguc-Kunt and Detragiache (1998, 2002) unveil that explicit deposit insurance schemes augment systemic banking crises probability, that negatively affects bank stability. Still, an institutional, well established and powerful environment may counteract unsupported effects of deposit insurance (Demirguc-Kunt and Detragiache, 2002).

The supervisory agency may be respected by this powerful institutional environment. The strict power of discipline regarding supervisory authorities cites their ability to proceed with actions to deflect and find a resolution to difficulties which may develop

within banks, although strong supervisory agencies can boost stability within banks. Furthermore, they could also impact negatively on banking performance. Monitoring within banking sector is complicated and costly. Improper monitoring within banks results in a negative impact on stability and performance, and strong supervision could counteract. Adding to that, bank supervision may also extenuate risk with bank runs, and stop increased risk-taking behaviour, evoked by deposit insurance schemes.

Furthermore, supervision may aggravate corruption, when supervisors abuse power (Barth, Caprio and Levine, 2004). However, Barth, Caprio and Levine (2004) do not uncover a powerful relationship between disciplinary supervisory power and bank's development and performance. Nevertheless, Fernandez and Gonzalez (2005) believe that when the presence of accounting and auditing requirements are lacking official discipline, this may bring down risk-taking in banks.

In addition, concerning capital rules within banks, this has been under intense scrutiny from regulatory and supervisory bodies. The Basel II capital framework which fixes minimum standards for capital adequacy is the primary capital framework on an international level. Implementations for capital adequacy requirements are placed because of the value attributed with capital strength within banks. However, any positive results are not recognised worldwide. Rules concerning capital adequacy could alter and lessen risk-taking incentives of banks, as displayed by (e.g. Konishi and Yasuda, 2004). Hart and Zingales (2009) show that capital adequacy requirements could counteract with motivation in banks mistreating low budget borrowing possibilities, elicited by deposit insurance schemes.

On the contrary, other researches find that capital adequacy requirements increase bank risks (Blum, 1999). For example, returns regarding bank risks have limited boundaries with capital requirements. Portfolios of risk assets maybe set up, consequently because of decreased leverage which intensifies risk taking incentives (Koehn and Santomero, 1980; Kim and Santomero, 1988 cited in Konishi and Yasuda, 2004). Needless to say Milne and Whalley (2001) conducted a study, which revealed no specific influence regarding capital requirements on bank risk-taking. In addition, neither does Barth, Caprio and Levine (2004).

Further opposing argument on the bank safety and soundness has been presented by Besanko and Kanatas (1996) who argued that regulatory capital standards may not promote the bank safety. The argument stems from the notion that the ownership of a bank may become diluted as an end result of issuing equity and thus provides a limitation for expending efforts on the bank's stockholders' behalf.

Moreover, there are various reasons for bank authorities to limit on banks activities. Interaction with a varied range of activities could consequently result in a moral hazard state of affairs, and conflicted interests. Adding to that, complicated and powerful banks may prove awkward to discipline and monitor. Even though, permitting a varied scope of bank activities, this may demonstrate a beneficial factor for bank stability, and less restraint on bank activities could raise the franchise value of banks, hence motivating more discreet behaviour. In addition to this, potential chances for economies of scale, and the diversity of income streams can bring forth further steadiness in banks (Barth, Caprio and Levine, 2004). Barth, Caprio and

Levine (2004) have discovered that restrictions regarding bank activities are pessimistically related to bank development and stability. Adding to this, Gonzalez (2005) demonstrated that regulatory restrictions lead to a decrease in bank's charter value, which results in a creation of increased risk-taking incentives. Comparatively, Fernandez and Gonzalez (2005) concluded that limitations can in fact decrease bank risk, when accounting and auditing requirements are inadequately developed.

Furthermore, developed accounting and auditing requirements could be used as well as an instrument to control bank risk-taking. As soon as these requirements are implemented, banks expose further information to the industry, resulting in an increase in the market's ability; applying bank discipline (Flannery and Sorescu, 1996; Sironi, 2003 cited in Fernandez and Gonzalez, 2005). In addition to this, Fernandez and Gonzalez (2005) propose more rigorous disclosure requirements, which could strengthen the ability of the supervisors in disciplining managers, therefore gaining banks stability. Furthermore, they may change the potency of capital adequacy requirements for the better. Also, Fernandez and Gonzalez (2005) show that accounting and auditing requirements decrease banks' risk-taking. In particular, auditing requirements can make up for risk-shifting incentives as a result of a generous amount of deposit insurance, as well as this, information disclosure can counterbalance risk-shifting incentives in banks that possess low charter values. Adding to that, their accumulations of findings imply that accounting and auditing system can complement the capital requirements; however, it can also be a substitute to the restrictions on banking activities and official discipline.

However, local authorities in any country may set new regulations for access into the

banking industry to limit competition. Nevertheless, the significance of regulating bank access is open to academic debate. Advocates in charge of bank access restrictions emphasise the influential benefits of banking stability, particularly more competition may decrease the franchise values of banks, hence augmenting risk-taking incentives (Keeley, 1990). In addition, competitiveness for deposits accumulates increased risk-taking incentives, because of high deposit rates (Niinimaki, 2004). So far oppositions of restrictions advocate the positive effects of competition (Barth, Caprio and Levine, 2004). Superior entry restrictions on foreign banks and ownership may magnify vulnerability within banks as demonstrated by Barth, Caprio and Levine (2004) and Beck, Demirguc-Kunt and Levine (2006).

2.6 Summary

The most vital disadvantage for banking sector in MENA region apart from the low rate of development and high levels of isolation is the poor credit information environment prevalent in the region (Anzoategui, Peria and Rocha, 2010). The credit rating agencies tend to overreact to financial crises even in the environment with excellent credit information (Elkhoury, 2008) and therefore, the impact of the credit rating agencies is expected to be further magnified in the MENA region.

This chapter outlines several advantages of the banking sector in MENA region and these advantages can be summarised as follows:

- Single regulatory body in the form of a national bank.
- Risk-avoiding culture.

- Low limitations regarding banks' activities.

On the other hand, a number of disadvantages of the banking sector in MENA region have been identified as well. The severity of particular disadvantages varies greatly among particular sub-regions or individual countries; however, the general set of disadvantages includes the following:

- Low rate of financial development.
- Low level of competition in the banking sector.
- Sector still dominated by state banks.
- Inward-looking policies and isolation from the international trade.
- Influence of the credit rating agencies.

It needs to be acknowledged that while the above listed advantages and disadvantages apply to the banking sector in MENA region on a general level, the applicability of the issues depends on the perspective taken. In other words, some of the disadvantages may actually become advantages for foreign banks wishing to establish a presence in the MENA region and vice versa. An example of this can be made of the fact that the banking sector in MENA region is dominated by state banks. The study conducted by Micco, Panizza and Yanez (2004) revealed that foreign banks in the region are out-performing both private and public domestic banks which suggests the existence of a window of opportunity for foreign banks, allowing for a high competition in the MENA region.

Lastly, with respects to bank risk and risk-taking incentives, an environment factors concerning bank's characteristics, market structure, macro-economic, political and legal, add to the stability of banking sector. A good shape of these environmental factors strengthens banking stability, especially those of environmental characteristics which impinge on the behaviour of banks risk-taking. The regulatory and supervisory environment takes a special place within this context. While supervision and regulation intend to reach soundness of banks, existing theory and empirical evidence make diverse repercussions available on banking risk. Capital adequacy requirements and deposit insurance schemes are put in place in order to intensify banking stability; however this could generate moral hazard conditions that increase bank risk-taking.

As well as this, researchers and academicians have mixed views on the banking activities, some argue to support the restrictions on these activities and the others are pleased in permitting a larger range of activities for banks. Furthermore, the strict power of supervisory agency may establish advantageous benefits for banking stability. However, this may also magnify corruption. Requirements regarding accounting and auditing increase the industries and the supervisors' capability in implementing disciplinary, resulting in bank risk reductions. What is more, opposing opinions exist regarding competition, access restrictions within the banking sector, and the impact of these on banking stability. Putting into consideration the various theoretical opinions and empirical evidence, the impact of such factors on bank's or country's credit ratings will be of interest to be observed in this research.

CHAPTER 3

LITERATURE REVIEW ON CREDIT RATING MODELS

3.1 Introduction

This chapter will provide an overview of the literature relating to the objectives of this research. It will first outline the assessments of credit rating agencies and it will focus on studies that investigated the estimation of sovereign and banks credit rating models.

The literature review regarding credit rating research has been addressed two strands of studies. The first strand examines the impact of initial credit ratings and changes in the credit ratings on stock and bond prices. The second strand of studies investigates the determinants of credit ratings (Poon and Chan, 2007). Since this research concentrates on estimating credit rating models in MENA countries and their commercial banks, the literature review concentrates on two groups of studies. The first group includes studies that have evaluated and assessed the role of credit rating agencies; the second group reviews empirical studies that examined and estimated sovereign/countries and banks credit rating models.

The determinants of bond and credit ratings have been examined by many scientific scholars and researchers. For example, Altman *et al.* (1981) constructed an early application to bond ratings and other financial analysis. They used different statistical techniques, including multiple regression analysis, Multiple Discriminant Analysis

(MDA), unordered and ordered logit models and probit models. This study uses similar models, including linear regression, analysis of variance, and ordered logit and ordered probit in estimating sovereign and banks' credit rating models. The following Figure (3.1) illustrates the main determinants for the existing research. The left box represents MENA bank's credit rating, a dependent variable in the regression performed in this study. The right box indicates MENA countries' ratings, the second dependent variable in the regressions. The middle portion represents linearization of the banks' and countries' ratings, while also encompassing factors that predict banks' and countries' ratings. The top and bottom boxes represent the factors used to predict ratings, which includes financial factors such as loans as a percentage of total assets, GDP growth, and a government's attempt to control behaviour through the rule of law, among many others addressed in this chapter.
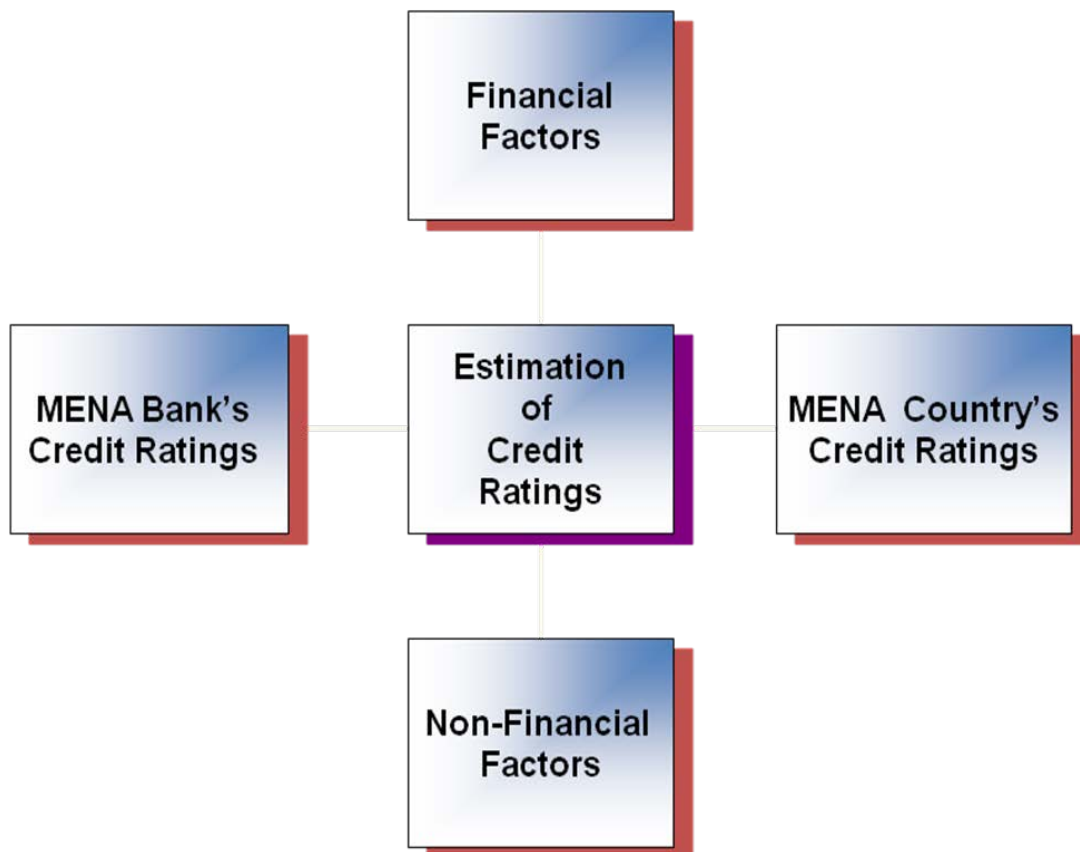
Figure (3.1): Key Determinants for the Current Research

3.2 Credit Rating Agencies

3.2.1 Evaluation of Credit Agencies

The problem credit rating agencies have been facing is that their contents are badly misunderstood. Credit rating agencies, which affects the cost of annual issuance of approximately US$600 billion in unsecured bank debt in Europe alone has to been observed in detail. The models and criteria for risk rating assessment should be reviewed closely (European Central Bank, Working Paper 2012). Banks ratings are a particularly important determinant of issuance cost of senior unsecured debt. Senior unsecured debt remains the largest source of long term funding for banks (Wyman,

2011). Secured debt accounted for less than 30% of total bank debt issuance in 2009; this figure had risen to 40% in the first half of 2012, according to data from Dialogic (European Central Bank, Working Paper 2011). Further, publicly funded recapitalization and guarantees on deposits and debts put pressure on the credibility of sovereigns' signatures. Agency relationship is the main area of concern when it comes to the rating. The financial investors (rating consumers) who are paying for the exercise and the banks (institute under review of the credit riskiness throughout its cycle) can easily lobby the agencies for a positive rating.

Another risk associated with the credit rating is the self-interest which could easily affect the quality of ratings. The larger the potential future business, the larger would be the agency's incentive to inflate things. As Calomiris (2009) highlights that the short term profits and high leverage could lead to the collusion between rating agencies and security investors. This explains why during an economic crisis, large quantity of collateralized assets could be seen on the bank's balance sheets. Another debate is that the credit rating varies during the economic cycle. The reason is that the rating quality decreases in the boom phase of the economy and increases in the trough phase. It is more difficult for potential investors to assess the rating quality. Further, our research explains that the rating of financial institutes specially the banks depends upon the models used for estimating the ratings. Based on evidences, it can be said that the credit ratings are good indicators of the bank's credit riskiness during crisis period.

A strictly ordinal method used for credit rating of banks has been deployed by the European Standard bank which suggests that the bank's credit rating depends upon

two factors. Bank's ratings firstly depends upon the credit ratings provided by the rating agencies and secondly the risk of being defaulted two years later. The difference between these two is termed as Ordinal Rating Quality Shortfall. This provides a good measure of relative rating error as it does not require the bank's rating to be absolutely correct.

Further, if Moody's expected default frequencies were used as source of ratings, it precludes arbitrariness in modelling choices. The findings of the European Central Bank are interesting to be mentioned here. As the information content of credit rating is higher during banking crisis, the ordinal rating in quality turns out to be countercyclical which further shows that the theoretical literatures were correct in predicting that the net benefit of rating agencies of providing good quality ratings are lower during peak business cycle. The credit rating agencies find an overlapping business which restrains them from providing negative ratings to the banks. Ratings are also biased when the banks are huge in size no matter their default could be observed in the coming years.

3.2.2 Informational and Reputational Value

While rating agencies make their fundamental rating methodologies available to the public, the specific assumptions and rationale of the rating assessment process is not disclosed. In general, agencies assess a company's industry characteristics, competitive position, and management quality to appraise its business risk and financial characteristics, financial policy, profitability, capital structure, cash flow protection, financial flexibility as concerns the company's financial risk. Most credit

rating agencies employ both quantitative models and qualitative analysis performed by rating analysts. However, some small agencies primarily conduct quantitative analyses (Frost, 2007). Generally, profitability, leverage, cash flow are regarded as central quantitative measure in the rating of entities (Shin and Moore, 2003). Robbe and Mahieu (2005) show that the relative new rating agency KMV that follows a quantitatively oriented, market-based approach achieves a timelier insight into changes of a firm's credit quality than Standard and Poor's. S&P is more qualitatively oriented and pursues an accounting-based approach, e.g. financial statements that are published at the most quarterly are essential to their analysis. Additionally, their review process is conducted once a year and takes a longer time (Robbe and Mahieu, 2005).

Credit rating agencies play an important role in overcoming asymmetric information situations on the market between borrowers or debt issuers and investors or lenders, and thus create reduced information costs. A credit contract between issuer and investor can be seen a principal-agent-relationship, being subject to issues such as hidden information, adverse selection and hidden action. Furthermore, a low credit risk issuer will have difficulties to get credit due to low returns. Credit ratings contribute to the facilitation of the principal-agent-problem by lowering informational asymmetries and revealing hidden information, which will lead the investor to demand a lower risk premium. What is more, credit ratings enable monitoring during the issuer-investor-relation. As a result, moral hazard and hidden actions issues are alleviated (Dittrich, 2007). In effect, credit ratings can enhance the efficient allocation of capital on markets (Frost, 2007).

In the current study, information asymmetric is readily present. the presence of information asymmetry shows up in the difference between governments' and banks' ratings, where, for instance, financial ratios and regulatory variables are important predictors of banks ratings, while macroeconomic conditions and governance are more important predictors for government ratings. The difference lies in the amount of information asymmetry between the two.

The informational value of credit ratings is subject to considerable debate. While some argue that ratings bring new information to the market (e.g. Ederington *et al.*, 1987; Baker and Mansi, 2002; Schweitzer *et al.*, 1992), others hold the view that ratings have little informational value (e.g. Partnoy, 2002). If the rating of bonds possesses significant informational value, then rating changes should lead to a change in security prices. Schweitzer *et al.* (1992) pointed out two mutually exclusive points of view. First, rating agencies have solely access to public information. This would imply that if a market is semi-strong efficient, then a rating change should not lead to a change in price as it does not express new information. Second, rating agencies have access to inside information because of the rating process that involves direct contact with company and management. Thus, rating changes will convey new information to the market. Furthermore, if investors believe that rating agencies are able to supply information at lower cost, the information that causes a rating change may be new for the market (Schweitzer *et al.*, 1992). In their study, Schweitzer *et al.* (1992) found that the rating of bank holding companies can convey new information to the market.

Nevertheless, an earlier study by Ederington *et al.* (1987) investigated the informational content of bond ratings. Their study found that the financial market relies on Moody's and S&P's ratings, they continue to argue that these two are more consistent in their data than other agencies and that by viewing ratings as equally reliable measures of an issue's creditworthiness.

However, examining the informational content of domestic credit ratings on stock returns of the rated companies in China, Poon and Chan (2007) conducted research using Xinhua- Far East's long-term issuer ratings. They applied multiple regressions in analysing pooled time-series cross-sectional ratings data of 170 companies during the period 2002-2006. Their empirical findings show that Xinhua-Far East's transmits information and its ratings do have significant effects on the stock returns and the decisions of investors.

Even though there is a correlation between credit ratings of agencies and default rates, critics still doubt of the agency's informational value and take the view that ratings reflect solely information that is already in the market price (Partnoy, 2002).

Another crucial aspect of credit rating economics includes the reputation mechanism. Credit rating agencies themselves are subject to moral hazard since they do not have a personal stake in the objects they rate, and thus lack incentives to provide high quality service (Dittrich, 2007). According to the reputational capital model, a well-functioning reputation mechanism will produce high-quality ratings. A reputation for high-quality ratings will bring value to the business of a rating agency, e.g. reputation becomes a return producing capital asset (Hunt, 2009). Low quality

ratings would result in a loss of reputation, thus rating agencies are seen to have an incentive to assign ratings that are of high quality. There are disagreements concerning the validity of the reputational capital model. While market imperfections such as limited competition, conflicts of interest and implications of rating-based regulation do exist, some conclude that the reputational capital model does not work, whereas others argue that the models works despite these imperfections (Hunt, 2009). Moral hazard could certainly be present in the current study, in that banks and countries request ratings based upon a perceived, or likely, outcome. Testing for moral hazard is difficult given the interpretation required in evaluating the empirical evidence.

3.2.3 Quality of Ratings

The quality of credit ratings is of vital importance for the proper functioning of the ratings market. It is also a heavily discussed topic. In particular, the rating agencies were heavily criticised for their assessment of the quality of new financial products such as asset backed securities, which many argue to be a vital factor in the origin of the subprime crisis. Kuhner (2001) discusses rating agencies' incentives to misrepresent the quality of issuers in times of enhanced systemic risk. Roch (2005) studies motivational factors that may impact on performance. In the qualitative analysis part professional analysts will personally review the business by visiting the company and talking to the management. While a qualitative analysis may enrich the assessment of a company's creditworthiness, it also gives way for personal influences and incentives. Another point of the criticism concerns the agencies' disclosure practices that are criticised due to their lack of transparency (Frost, 2006).

Moreover, the payment structure of agencies is seen as a source of conflict of interests. Initially, the rating agencies generated financial resources through the sale of publications and other materials. However, when these revenues were not sufficient anymore in the face of increased demand for rating services, the agencies started to charge issuers for ratings. This may create incentives for the agencies to assign higher ratings in order to satisfy their clients (Cantor and Packer, 1994). Still, a proper functioning reputation mechanism should counteract these incentives.

In support with the above argument, credit ratings have gained another function of serving as a regulatory tool in the context of rating-based regulation (Dittrich, 2007). In particular the Basel II Revised International Capital Framework amplified the dependence and reliance on ratings agencies (Frost, 2007). However, the incorporation of credit rating agencies into the regulatory framework may add further value to the ratings. The demand for ratings is then not directly linked with quality, which in turn impedes the working of the reputation mechanism and may lead to agencies assigning low quality ratings (Hunt, 2009). Moreover, Jackson (2001) illustrates another problem of rating-based banking regulation. Credit rating agencies tend to raise ratings in times of growth and to lower them during downturns. This however implies that during the boom times, banks are allowed to have lower capital reserves than in downturns, which is "*the opposite of what financial economics suggest being the optimal approach for capital standards*" (Jackson, 2001).

The above argument is present in the current study, which shows the statistical significance of macroeconomic factors and reserve regulations. In general, the study finds that improved macroeconomic conditions are correlated with higher ratings,

while greater reserve regulations are correlated with lower ratings. This potentially non-optimal approach to ratings suggests that the qualitative analysis behind ratings agencies' quantitative analysis may involve some moral hazard.

An argument concerning the timeliness of credit ratings is valid since credit rating agencies are faced with conflicting requirements due to opposing interests of issuers and regulators on one side, and investors on the other side. The former demands stable ratings that reflect a long-term perspective, while the latter requires timely information that reflects any changes in an issuer's credit risk (Frost, 2007). A widespread criticism of ratings agencies is a lack of timeliness of their ratings. In particular, criticism concerns the failed anticipation of corporate defaults such as in the case of Enron and WorldCom and the Tequila and the Asian crises in 1997 (Robbe and Mahieu, 2005; Alexe *et al.*, 2003). However, concerning their accuracy, studies seem to suggest that credit rating agencies have assessed corporate bonds' relative credit risk and distinguished between companies of bad and good credit quality fairly well (Baker and Mansi, 2002; Robbe and Mahieu, 2005).

For example, a report completed in 2004 in relation to the credit ratings and investors, Toby Nangle, the director of fixed income and currency at Baring Asset Management, stated that investors should rely on several sources and use credit ratings as one of these sources. He also added that credit ratings would be most useful if they were accurate and estimated well by rating agencies. Another point of view by a senior fellow and lecturer with Wharton's management department, Stephen Sammut, noted in the same report that in theory it is up to the investors to decide whether that ratings are accurate or not by rating agencies.

In addition, Elkhoury (2008) stated in his paper that more stable ratings are better ratings. According to the argument made by Bhatia (2002), measured "failures" are based on ratings stability. For that, stable credit ratings by all the agencies are needed not only to deliver better ratings but also to predict that ratings.

Furthermore, the issue of unsolicited ratings is controversial one and subject to debate. The majority of ratings assigned by the agencies are so-called solicited (non-shadow) ratings, when the issuer explicitly requests to be rated from an agency. However, the agencies also assign unsolicited (shadow) ratings that have not been requested by the issuer but based predominantly on publicly available information (Cantor and Packer, 1994; Poon and Firth, 2005). The credit rating agencies run the risk that its ratings are not accurate when unsolicited ratings based on public information and differ to the type of information that solicited ratings is produced (DOJ, 1998). Some argue that unsolicited ratings prevent issuers from requesting ratings only from agencies that are known to assign more favourable ratings. Others claim that these ratings coerce issuers to pay for a proper rating when they feel that the unsolicited is too low due to the sole use of public information (Baker and Mansi, 2002). Poon (2005, 2009) finds evidence that unsolicited ratings are systematically lower than solicited ones. However, Dittrich (2007) concludes that while the threat of unsolicited ratings is real, it seems to be overestimated.

3.2.4 Differences across Agencies

There are many ways in evaluating and comparing between credit rating agencies. Generally, researchers start to focus more on the differences between these agencies, and that due to the unexpected failure for some of these agencies in

predicting bank's and country's credit ratings. However, rating agencies should put into their considerations to include more specific variables and effective indicators that can affect significantly or reflect positively in estimating bank's or country's credit rating.

Credit ratings do not always correspond across the major agencies. First of all, rating scales are not identical. Besides, differences across agencies are observable. A number of empirical studies have investigated the disagreement between international rating agencies to examine whether banks are more opaque than non-banks firms. For example, Morgan (2002) examined bank opaqueness using split ratings between Moody's and S&P's rating agencies to assign different rating from these two agencies to a bond issue. By utilising data on new US bonds issued during the period of 1983-1993, his analysis finds that Moody's and S&P's agencies have disagreement in ratings over banks firms than over non-bank firms. Another finding in his study suggests that bank assets and capital structure give explanations for the disagreement between the two leading agencies.

Another supporting study in the disagreement between rating agencies was presented by Iannotta (2006). He followed the above study of Morgan (2002) to analyse bank relative opaqueness by investigating whether S&P's and Moody's disagree over bank bonds than over non-banks firms and also to examine the effect of bond seniority on the disagreement between rating agencies. His sample includes 2473 bonds issued by 248 firms in 14 European countries during the period 1993-2003. Employing ordered logit regressions, his empirical analysis shows three main findings; first, he concluded that fewer bank issues have split ratings, and when

controlling for risk and other issue characteristics, the predicted probability of a split rating is higher for banks than non-banks firms. Second, he confirmed that bank opaqueness increases with financial assets, bank size and capital ratio while bank opaqueness decreases with bank fixed assets. Third, lower bond seniority increases opaqueness and disagreement between rating agencies.

However, Cantor and Packer (1994) consider the differences between agencies to be "*common, unavoidable and desirable*" since in their view disagreements promote better understanding. However, these differences cause problems for the regulatory ruse of ratings (Cantor and Packer, 1994). The use of credit ratings in regulation implies the assumption that agencies' rating scales are equivalent. Still, according to Cantor and Packer (1997), there are agencies that systematically assign higher credit ratings than other agencies and in their study they conclude that the same letter grades represent different levels of default risk for individual agencies. In another study of theirs regarding sovereign credit ratings, they conclude that while the agencies show similarities in their rating categories, they appear to weigh factors differently (Cantor and Packer, 1996).

Another study by Shin and Moore (2003) focused on national differences in credit risk assessments by examining differences between the credit ratings of US and Japanese rating agencies. They examined the credit rating of 26 Japanese financial firms and 66 Japanese non-financial firms by using US rating agencies (Moody's and Standard & poor's) and Japanese rating agencies (Rating & Investment Information and Japan Credit Rating). The purpose of their investigation is to provide evidence on the US agencies that they ignore special corporate governance features of Japanese firms (e.g., Keiretsu affiliation). Employing ordered probit estimation model

for each of the above four agencies, their results indicate that ratings by the US agencies assign lower ratings to Japanese firms than Japanese agencies in examining the financial and non-financial Japanese firms. They also find that ratings by Japanese agencies have very high rank correlation comparing with those of US agencies, and they assume that a general home bias explains these differences. This means that the differences between US and Japanese agencies support the investigation to show that US agencies (Moody's and Standard & Poor's) pay no attention to the special nature of Japanese governance.

Furthermore, a recent study by Hill, Brooks and Faff (2010) investigated the differences between particular sovereign credit ratings provided by the three most renowned agencies - Standard and Poor's, Moody's and Fitch. The examination was based on a longitudinal study (1990-2006) and included a total of 129 countries. Overall, while individual credit rating agencies tend to disagree about credit quality; these differences are relatively minor and usually confined to up to two notches on the scale. A more in-depth evaluation of this phenomenon conducted by Alsakka and Gwilym (2012) revealed three particular reasons for the differences in credit ratings provided by individual agencies. First, different economic factors and different distribution of weights on the factors is used by the agencies. Secondly, there is a lack of a consensus amongst credit rating agencies about more opaque issuers. And thirdly, the smaller rating agencies tend to favour issuers based in their home region. Moreover, a certain degree of lead-lag relationships across credit rating agencies has been uncovered by Alsakka and Gwilym (2010). The authors highlighted that while Moody's tends to introduce the credit rating upgrades as the first agency, these

changes are consequently followed by all major agencies with the exception of S&P's which can be characterized by its least dependence on other agencies.

With regard to the time differences between agencies, Bissoondoyal-Bheenick (2004) did a comparison study between the biggest leading rating agencies Moody's and Standard and Poor's to examine if there were any timing differences of the single and joint rating changes and whether these changes had an impact on the country's stock market. His study covers a period from 1975 to 2002, and focuses on Moody's bonds and notes ratings with Standard and Poor's foreign currency ratings. From the initial 100 countries in both agencies and from countries that associated with joint ratings, Moody's included eight countries, namely, Chile, Indonesia, Ireland, Korea, Malaysia, Mexico, Pakistan and Thailand. Standard and Poor's included six countries, namely, Argentina, India, Indonesia, Korea, Pakistan and Turkey. His findings pointed out that those rating changes do not offer any additional information to the stock market or investors. Additionally, a remarkable finding shows an impact of the joint rating downgrades on the stock market only when these in-between the announcement dates for both agencies but the case for rating upgrades is not the same. However, for the cumulative abnormal returns in dealing with both agencies Bissoondoyal-Bheenick (2004) found that Standard and Poor's discloses that joint ratings have a higher impact than the single ratings, but Moody's are higher for joint downgrades than the single ratings after 10 days of the announcement second rating change.

Furthermore, Moody's downgraded the Swiss Bank Corporation from AAA in 1992, whereas S&P downgraded them only in 1995 (Valdez, 2007). An earlier study on

Moody's assigned ratings was presented by Lucas and Lonski (1992); they demonstrated that number of firms that downgraded in ratings has gradually gone over the number of firms that upgraded in ratings over time. They also suggested that the reason beyond the issue of downgrading and upgrading in firm's credit ratings is either the quality of these firms has declined from time to time or the standards and requirements of credit ratings have become more rigorous.

A report completed in 2004 by Moody's top Russia analyst, John Schiffer and published by Wharton school of the University of Pennsylvania explained that "*if a country defaulted within a year of investment grade; that would be viewed as a wrong call. You should be prescient by at least a year*". Early in 1998, Moody's downgraded Russia two times – just a few months before Russia crashed. "*We moved before the others (S&P's and Fitch's)*", John Schiffer added.

Another report made in Wharton finance and written by Professor Franklin Allen pointed out that credit rating agencies did not give a sign of the Argentinean's default until their government is about one month of proclaiming bankruptcy ahead of peso devaluation. He believed that credit rating agencies should have called the default of Argentina much earlier than they did. In addition to that, Toby Nangle confirmed by saying "*I honestly don't know why rating agencies didn't move earlier in tandem with Argentina ratings. Maybe they were conscious of the potential feedback and didn't want to worsen the situation on the ground*". However, rating agencies aim to not get caught out but they may have been caught out in Argentina and they were caught out before as in Mexico, Uruguay and during the Asian crises in 1997.

Further evidence on the failures of rating agencies has been reported recently by Elkhoury study in 2008. He analysed the impact of credit rating agencies on developing countries and assessed the deficiencies of credit rating agencies. He explains in his study some of the failures which caused by Moody's and Standard and Poor's; as they failed to predict the Mexican and Asian financial crises and this failure was due to the fact that credit rating agencies ignore things like contingent liability and international liquidity considerations into their estimations. Another failure has been reported by Standard and Poor's during the Russian and Argentinean crisis; and Moody's failed to predict the Russian crisis but not the Argentinean one.

Recently, the shortcomings of the current models of credit rating agencies have been highlighted in studies conducted by Polito and Wickens (2012) and Polito and Wickens (2013). While Polito and Wickens (2012) focused on the examination of US data from 1970 to 2011, the later study (Polito and Wickens, 2013) is based on the examination of European countries in the period of 1995-2012. Both studies highlighted that the credit ratings should have been downgraded prior to the debt crisis.

The practical difficulties that arise from the arguments proposed in the existing body of research however prevent any significant development in this area. While Veron and Wolff (2011) recognised the inadequacies in the sovereign credit ratings, the authors highlighted the complex issues in improving the quality of ratings. The delegation of the task of providing sovereign credit ratings to public authorities is also considered to be ineffective (Veron and Wolff, 2011).

3.3 Estimation of Sovereign and Bank's Ratings Models

3.3.1 Studies on Sovereign Credit Ratings

In recent years, we have witnessed ongoing research on investigating sovereign ratings and risk assessments that are assigned by credit rating agencies. Additionally, studies on examining the determinants of sovereign ratings and the impact of these have been increasing in recent years to estimate credit rating models.

Studying sovereign ratings is a good advantage and an important determinant in estimating credit rating models since its crucial influences on a country's institutions and policies are central to the foundations of financial market and economic development. It is plausible that financial sectors across countries are different in developing and sustaining good economic. Thus, the major differences in financial sector developments across countries will raise the need of independent rating agencies, to reconsider their assessments for how they may influence the financial development (Kim and Wu, 2008).

For example, recent empirical study on the determinants of Standard and Poor's assigned ratings, Kim and Wu (2008) investigated the influence of sovereign credit ratings on various measures of financial market developments in a panel of 51 emerging countries (including 7 MENA countries) over the period 1995-2003. Their panel regression estimations find strong evidence on sovereign rating measures to have an impact on financial sector developments and capital flows. By employing country economic variables and aggregate governance indicators, their findings

stated that sovereign credit ratings are critical determinants of financial development in different financial sectors within emerging markets.

Kim and Wu's (2008) study is similar certain findings in the current study, which addresses the effect of governance on ratings. This study confirms many of the findings of Kim and Wu, in particular the effect rule of law, corruption, and political stability have on ratings.

However, Afonso *et al.* (2007) stated that there are many reasons which explain the importance of investigating sovereign credit ratings; firstly because it is a key determinant of the interest rates that a country will face in the international financial market and its borrowing costs. Secondly, sovereign ratings possibly will face an impact on the ratings assigned to domestic banks or firms. Thirdly and most importantly, some institutional investors have lower boundaries for the risk they predict in their investments and for that they are expected to choose their bond portfolio considering the credit risk perceived by the ratings symbols which will show the real situation of their investment.

Since economic factors are essential determinants of sovereign credit ratings, research conducted on these ratings may give some indication to the importance attributed to economic factors by the rating agencies. In the first systematic study on the determinants of sovereign credit ratings, Cantor and Packer (1996) used ratings that assigned by Moody's and Standard and Poor's for 49 countries as of September 1995. Applying Ordinary Least Square (OLS) regression to a linear representation of the ratings, they found distinct economic factors to be significant in the determination

of a country's rating: per capita income, GDP growth, inflation and external debt. Cantor and Packer's model can explain more than 90 per cent of the cross-sectional variation in ratings and their methodology was followed by Afonso (2003), Alexe *et al.* (2003) and Butler and Fauver (2006). Similarly, Canuto, Santos and Porto (2004) identified a small number of variables that explain differences between the ratings of different countries, these are; per capita income, economic growth, inflation, external debt/current account receipts ratio, and central government gross debt/total fiscal receipts ratio. The findings of these studies are generally confirmed in this study, which finds that per capita income, economic growth, the amount of debt, and other balance sheet variables significantly impact a country's credit rating.

Later on, Butler and Fauver (2006) followed the same methodology as in Cantor and Packer (1996) to examine cross-sectional determinants of sovereign credit ratings on a sample of 86 countries (including 13 MENA countries)[5]. They found that quality of the legal environment is among the most significant factors explaining the country's credit ratings. The legal environment was also found to be statistically significant in the current study, and in particular on government credit ratings, more so than banks' ratings.

Cruces (2006) investigated a study on the statistical properties of institutional investor country credit ratings. Employing 173 countries in 11 portfolios based on location and special characteristics, he contributed by modelling the rating transitions of expected repayment capacity, and by testing empirical implications using series of sovereign credit ratings. His main findings were that ratings effectively displayed volatility clustering and asymmetric adjustments, their revisions are serially

[5] In 2006, Butler and Fauver have included 13 MENA Countries in their sample; these countries are: Bahrain, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Morocco, Pakistan, Qatar, Saudi Arabia, Tunisia and Turkey.

correlated during most of the sample, and region and other characteristics capture common persistence in the ratings. In his analysis, he concluded that it has three implications of interest to investors; a country's current credit rating is not necessarily the best forecast of its long term sovereign risk, the forecast function is different across countries at a given point in time, and this function should be reassessed from time to time. The current study also found serial correlation issues in the ratings and other variables, although the serially correlated-adjusted results did not change any of the conclusions.

Cruces (2006) mentioned in his article that linear regressions of country credit ratings on macroeconomic variables as in the following studies (Cantor and Packer, 1996; Feder and Uy, 1985; Lee, 1993; Haque *et al.*, 1996) suggest that a higher fundamental volatility implies a higher rating volatility. However his analysis suggests that countries in the default range would have higher variance of credit revisions even if all countries had the same volatility of repayment capacity.

More empirical studies on the assessments of credit rating determinants have been analysed econometrically for mature and emerging markets (Cantor and Packer, 1995; Haque *et al.*, 1996, 1997; Reisen and Maltzan, 1999; Juttner and McCarthy, 2000; Bhatia, 2002). These studies found the following variables explain 90 per cent of the variation in the ratings, these are; GDP per capita, GDP growth, inflation, default history and the level of economic development, the ratio of non-gold foreign exchange reserves to imports and the ratio of the current account balance to GDP.

Specifically, Haque *et al.* (1996) presented a comprehensive study that examines the correlation between country credit ratings and macroeconomic variables. They covered over 60 developing countries observed during the period (1980-1993). Employing linear regression analysis, they found that all the following variables; the country's foreign reserves holdings, output growth, and the current account balance in the year before the rating was published are domestic determinants of credit ratings. They also reported that the international's worsening scenario will reduce the effect of credit ratings by a sizable amount on local fundamentals.Similar findings are present in the current study.

Contrary to the OLS estimation techniques used by Cantor and Packer (1996), Bissoondoyal-Bheenick (2005) employed an ordered response model to analyse the determinants of sovereign credit ratings. The purpose of his study is to measure the significance of the economic variables[6] in the determinants of the rating for each country. He examined a sample of 95 countries covering the period from December 1995 to December 1999, and used data provided by international agencies, Moody's and Standard and Poor's. His findings indicate that financial variables alone do not determine sovereign ratings. In addition, he concluded that there is a different level of importance between economic variables for the sample of high rated countries compared to the low rated countries. Of the economic variables used, he found that GNP per capita and inflation are key economic indicators and they trigger the same importance in the forecast of the sovereign ratings over the years and between the agencies. In addition, Bootheway and Peterson (2008), consistently, identify GDP

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[6] The economic variables which are used by Bissoondoyal-Bheenick's study in 2005 are: GNP per capita, inflation, government financial balance/GDP, government debt/GDP, real exchange rate, foreign reserves, and net exports/GDP. He used the unemployment rate and unit labour cost to capture the measures for the 25 high rated countries. In addition, net export/GDP is replaced by current account/GDP and foreign debt/GDP is included to reflect the level of debt of 70 low rated countries.

per capita, real GDP growth rate and inflation as key macroeconomic factors. However, they also discover regional variations in the determinants of sovereign credit ratings. This study does not address regional variations, rather focusing on certain Arab countries. As mentioned, the current study does find the significance of GDP per capita and other macroeconomic variables as statistically significant in predicting credit ratings. Also consistent with Bootheway and Peterson (2008), governance and regulatory variables also factor into the final credit rating.

However, Afonso *et al.* (2007) estimated models for sovereign (country) credit ratings assigned by three rating agencies; Standard and Poor's, Moody's and Fitch ratings for a panel of 130 countries (including 14 MENA countries)[7] from 1995 to 2005, using a variety of economic indicators. In contrast to logistic models, they employ augmented linear regression and ordered probit models that explicitly account for country-specific fixed and random effects. Their setting allows for the modelling of unobserved country-specific effects that are correlated with the random error term, arguing that this is the best procedure for panel data as it considers the existence of an additional normally distributed cross-section error term. More importantly, their limited dependent variable modelling approach allows for the effect of an explanatory variable to be distinguished between the short-run (immediate) and long-run effect. Although this approach might be useful in future research on the credit ratings covered in this research, no attempt was made at distinguishing between short-run and long-run effects. Such a distinction would also be difficult given that the data set only includes at most 13 years of history for each panel member.

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[7] In 2007, Afonso, Gomes and Rother have included 14 MENA Countries in their panel data; these countries are: Bahrain, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, Turkey and United Arab Emirates.

As sovereign ratings comprise not only economic risk, but also political risk as well, research conducted on sovereign ratings may reveal important political factors considered in the rating process in this context too (Cantor and Packer, 1996; Bootheway and Peterson, 2008). Moreover, studies have explicitly examined the influence of political factors on the banking system as well as on banks ratings.

Bootheway and Peterson (2008) show that property rights and corruption significantly influence sovereign ratings. This relationship also holds in the regional subset of Western Europe and North America. Alexe *et al.* (2003) make use of the World Bank Governance Indicators to examine political stability, government effectiveness and corruption as determinants of sovereign ratings. The additional inclusion of these political factors leads to better classification results than the mere consideration of economic factors. The findings of Bootheway and Peterson (2008) are confirmed by this study, which finds that non-financial factors such as political stability and absence of violence and terrorism, government effectiveness, rule of law, and control of corruption influence the final credit rating.

3.3.2 Studies on Banks Credit Ratings

While the above studies focus on sovereign (country) credit ratings, Poon, Firth and Fung (1999) conducted multivariate analysis for a sample of 130 banks covering 50 countries, using Moody's assigned ratings. Employing logistic regression models, they found significant effects of three bank level factors representing loan provisions, risk and profitability ratios, as well as bank debt.

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In a different study, Poon and Firth (2005) have developed a model to explain differences in bank ratings and to assess bank rating determinants, using an international sample of 1,060 banks assigned by Fitch's Bank Individual Ratings (FBRs) across 82 countries (including 12 MENA countries)[8]. They have employed 25 financial variables[9] of the sample banks for all statistical tests and models, these ratios are extracted from the Bankscope financial database (Bankscope). They used a treatment effects model based on Heckman's two-step estimation method for the purpose of taking an account of any possible sample-selection or selectivity bias. In terms of the bank rating differences, their results asserted that there is a significant difference in the distributions of solicited and unsolicited ratings. Poon and Firth indicated that banks that received shadow ratings are smaller, lower and have weaker financial profiles than banks that received non-shadow ratings, which means that unsolicited ratings are lower than soliciting ratings. With regards to the assessments of bank rating determinants, their findings suggested that bank size, profitability, asset quality, liquidity and sovereign credit risk are important variables in determining Fitch's Bank Individual Ratings (FBRs).

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[8] In 2005, Poon and Firth have included 12 MENA Countries in their sample; these countries are: Bahrain, Egypt, Israel, Jordan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Tunisia and United Arab Emirates.

[9] The financial variables that used in Poon and Firth's study are as follows; **Profitability Ratios:** Net Interest Margin (NIM), Net Interest Revenue/Average Total Assets (NIMA), Pre-tax Operating Income/Average Total Assets (PROA), Return on Average Assets (ROA), Return on Average Equity (ROE), Dividend Payout (DPO) and Cost to Income Ratio (CTI). **Asset Quality Ratios:** Loan Loss Reserves/Gross Loans (LLR/GL), Loan Loss Provisions/Net Interest Revenue (LLP/NIR), Loan Loss Reserves/Non-Performing Loans (LLR/NPL), Non-Performing Loans/Gross Loans (NPL/GL), Net Charge Off/Average Gross Loans (NCO/AGL) and Net Charge Off/Net Income before Loan Loss Provisions (NCO/BNI). **Liquidity Ratios:** Interbank Ratio (INTERBANK), Loans to Total Assets (LTA), Loans/Customer and Short-Term Funding (LTD), Loans/Total Deposits and Borrowings (LTDB), Liquid Assets/Customer and Short-Term Funding (LATD) and Liquid Assets/Total Deposits and Borrowings (LATDB). **Capital Adequacy Ratios:** Tier 1 Capital Ratio (TIER1), Capital Adequacy Ratio (CAP), Equity to Total Assets (ETA), Equity to Loans (ETL) and Equity to Customer and Short-Term Funding (ETD). **Size:** Logarithm of Book Value of Total Assets (LNASSET).

Further international evidence on the determinants of (Fitch assigned) bank ratings is provided by Pasiouras *et al.* (2006) who employed ordered logistic regression on a sample of 857 commercial banks covering 71 countries (including 12 MENA countries)[10]. Their set of variables include bank level accounting and financial characteristics as well as country-specific regulatory, supervision and market structure indicators, and their general findings reveal significant support for both sets of variables on bank credit ratings. More specifically, they concluded that the less cost efficient banks with higher than average levels of provisions relatively to their income and lower liquidity tend to have lower ratings. Larger and more profitable banks tend to obtain higher ratings. Higher equity to assets ratio results in higher ratings only when we do not control for bank supervision and regulations. Hence, in a multivariate environment capital strength may be given less weight in the overall credit analysis that might be expected. With regards to the non-financial bank specific characteristics, they found evidence that banks with more subsidiaries and more institutional shareholders obtain higher ratings. For the country-specific regulatory and supervision variables, they found that banks in countries with lower capital requirement, restrictions on bank activities, official displinary power and no explicit deposit insurance scheme obtain higher ratings. Banks in countries with higher deposit insurer power, liquidity and diversification guidelines entry requirements, fraction of entries denied and economic freedom are also assigned higher ratings. Disclosure requirements and foreign banks entry have a significant impact on ratings only when we simultaneously control for the regulatory environment and market structure. Finally, they said auditing requirements have significant impact only when we control for the regulatory environment alone.

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[10] In 2006, Pasiouras, Gaganis and Zopounidis have included 12 MENA Countries in their sample, these countries are: Bahrain, Egypt, Jordan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Tunisia, Turkey and United Arab Emirates.

Regarding the market structure variables, Pasiouras *et al.* (2006) found that banks in markets with higher share of assets in foreign banks obtain higher ratings, while banks in markets with higher concentration and share of assets in government owned banks are assigned lower ratings. However, the influence of concentration and government owned banks are not robust to different specification of the model. More precisely, they have mentioned that the share of assets in government owned banks becomes significant when we control for the regulatory and supervisory power, while concentration becomes insignificant when we examine whether the market is a developed one.

In a recent study Ioannidis, Pasiouras and Zopounidis (2010) instead of trying to explain Fitch's bank credit ratings, they use Fitch ratings as a basis to develop a model to assess the soundness of banks. Their classification of bank soundness provides better results when incorporating country-level data, covering the regulatory and institutional environment, banking sector features and macroeconomic factors, compared to models with financial variables only. Furthermore, in order to analyse the relationship between compliance with Basel Core Principles for Effective Bank Supervision and bank soundness, Demirguç-Kunt, Detragiache and Tressel (2008) measure bank soundness with Moody's bank financial strength ratings.

Moreover, the influence of non-financial factors on bank ratings has not been studied sufficiently. There are but a few studies that analyse the impact of both financial and non-financial factors on bank credit ratings. With regard to the internal rating systems of banks; Grunert, Norden and Weber (2005) explored the role of non-financial factors in internal credit ratings, using four German commercial banks. Their set of

variables includes quantitative and qualitative data such as; market structure, profitability and liquidity. Employing logistic regression, they found significant results in showing that the combined use of financial and non-financial factors leads to a more accurate prediction of default events.

Regarding the assessment of state of the economy, Les Bras and Andrews (2004) point out a bank's financial performance is vitally affected by the economy the bank operates in. Accordingly, important economic indicators are utilised to determine the economic risk a bank is subject to. Among other features these generally comprise GDP, GDP growth, inflation, unemployment rate, exchange rates and interest rates (Les Bras and Andrews, 2004; Vuong, 2007; S&P, 2004a, 2004b).

Another study by Pasiouras, Gaganis and Zopounidis (2006), utilised the Economic Freedom Index as a proxy for the overall state of the economic environment and policies. They found that banks in an environment of greater economic freedom receive higher ratings. Hence, lower corruption, government bureaucracy and better quality and enforcement of the legal system may be seen as conducive for banking stability.

Furthermore, the banking environment is attributed a key role for the operations and performance of banks (Les Bras and Andrews, 2004; Standard and Poor's, 2004b). Rojas-Suarenz (2001) investigated a research on what lessons should credit rating agencies learn from financial indicators. He found that capital-to-asset ratio is the indicator that most used of banking problems in industrial countries, and this ratio has performed poorly as an indicator of banking problems in emerging markets such

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as Latin America and East Asia. Furthermore, Rojas-Suarenz sheds light on the selection of effective indicators to examine bank's performance and to avoid banking problems in emerging markets. He believed that "*indicators work where markets work*" and external rating agencies would be better off by concentrating more on effective indicators for the reason of assessing bank's financial risks and thus providing investors an adequate measurement of that risks.

The current study also finds various financial, macroeconomic, and regulatory effects on banks' credit ratings. In particular, this study finds that important financial ratio predictors of banks' ratings are net interest margin, return on average assets, return on average equity, net loans to total assets, net loans and liquid assets to total customer deposits and short-term funding, and total assets. Statistically significant regulatory predictors of ratings include such things as capital requirements, deposit insurance schemes, and internal management and organisational requirements. To a much lesser extent than government ratings, various macroeconomic variables also helped predict banks' ratings, including real GDP growth and the unemployment rate.

However, credit agencies recognise that financial firms differ from non-financial firms when assessing their creditworthiness by considering unique factors to banks (e.g. Les Bras and Andrews, 2004; Vuong, 2007). While measures of profitability, cash flow and leverage are important variables in the ratings of both financial and non-financial firms, rating agencies lay special weight on asset quality when rating the former (Shin and Moore, 2003).

Empirical study exploring the effects of innovation activity on firms credit ratings was presented by Czarnitzki and Kraft (2004), using Credit reform as the largest German rating agency. Their study has a set of three innovative measures; Research and Development (R&D), patent stock and the share of sales with newly developed products, as well as data that covers the period from 1992 to 1998 of Western German firms from the manufacturing sector. Employing ordered probit estimation, Czarnitzki and Kraft found the above measures have significant impact on credit ratings when they are used separately. They also discovered an inversely relationship for all three variables with internal optima. The optima show that credit ratings will increase when a rather high level of innovation is reached. Czarnitzki and Kraft (2004) verified that too much innovation activities on firms would be negative to the credit ratings because it is always subject to possible failures. They also confirmed that credit ratings would be improved with the increase of firm size, value added per employee and with firm age. In other words, younger firms are likely to have a bad credit rating because they have not obtained enough experience or history, besides that when a value added per employee within a firm is higher, the credit rating would be much better.

Another study by Amato and Furfine (2004) examined whether credit rating agencies are extremely procyclical by analysing the impact of the United States' business cycle on firms' credit ratings. Their datasets include US financial and non-financial firms assigned by Standard & Poor's ratings during the period 1981-2001. Their analysis presented a variety of variables that measure the business risk, the financial risk and macroeconomic indicators to analyse how these factors in US firms have an impact on credit ratings. Employing an ordered probit model to predict firms' credit

ratings; they found no evidence to show that credit ratings have an excess sensitivity to the business cycle. Adding up, when the time they limit their samples to include only investment grade firms or initial ratings and rating changes, they document to find evidence of procyclicality in credit ratings.

Several theories use credit rating transitions phenomenon in predicting default events. For example, some of the academicians and practitioners applied homogeneous Markov chain model, the first study by Jarrow *et al.* in 1997 was proposed to illustrate the dynamics of credit ratings (Parnes, 2007).

The study of Parnes (2007) provided an alternative approach to track credit rating transition probabilities. His internal correlations model tracks time-series movements within credit rating entries rather than cross-ratings correlations. He used Comustat database reports on 130,559 quarterly S&P's long-term credit ratings for 4510 industrial companies during the period 1985-2004. Parnes tested the non-homogeneous dynamic through Dickey–Fuller test and found to be statistically and economically significant.

Recent study by Feng, Gourieroux and Jasiak (2008) explored the dynamics of credit rating matrices from a different perspective. They proposed a factor probit model for modelling and prediction of rating matrices that are assumed to be stochastic and driven by a latent factor. The unobservable latent factor model in their study divulges the significant business cycle effect on credit rating transitions. Feng *et al.* (2008) provided evidence in support of the PIT (point-in-time) rating approach since discussion concerning two alternative credit rating philosophies; these are "point-in-

time" (PIT) and "through-the-cycle" (TTC), the latter philosophy disregards the economic cycle effect and offers higher values of cross-sectional correlations than the PIT. Feng *et al.* (2008) concluded that the banking supervisory authorities support and encourage the use of a factor probit model because it can be used in predicting a portfolio's future ratings. Also, there is an advantage of a latent factor model and that when it allows for computation of default correlations and the CreditVaR. Their results confirmed the link between credit quality changes and the underlying state of the economy.

On the other hand, Doumpos and Pasiouras (2005) investigated the development of credit rating models for the purpose of replicating the credit ratings of a regional agency. The analysis of their study is based on the credit ratings issued by Qui Credit Assessment Ltd., using a multicriteria classification method and focused on testing the out-of-time and out-of-sample effectiveness of the models. They used a sample of 500 non-financial companies operating in the UK, followed over the period 1999-2001. Doumpos and Pasiouras classified those companies into five risk groups as follows; Secure groups, Stable groups, Normal groups, Unstable (caution) groups and High-risk group. 100 firms from each risk group were randomly selected from the Financial Analysis Made Easy (FAME) database of Bureau van Dijk's, according to their QuiScore for the year 2001. Their results indicated that it is possible to replicate the credit ratings of the firms with a satisfactory accuracy by using publicly available financial data. Also by using a total of 26 financial ratios and 13 variables representing annual changes as evaluation criteria in the analysis, they found that 10

significant ratios[11] cover all aspects of financial performance to be significant in all years.

A comparative study in analysing credit ratings for the United States and Taiwan markets was proposed by Huang *et al.* (2004), applying new statistical techniques, namely, the learning theory Support Vector Machines (SVM) together with the highly performance method Back propagation Neural Networks (BNN). The purpose of their study has taken a place to provide a new model that serves credit rating predictions with better explanatory power. However, they used two bond rating datasets; for Taiwan, they obtained 74 cases with bank's ratings and 21 financial variables that covered 25 financial institutes during the period 1998-2002. For the United States, they acquired 265 cases of 10-year data that covered 36 commercial banks. By using BNN statistical method as a benchmark, they achieved prediction accuracies just about 80% for BNN and SVM methods for both markets. Results of Huang *et al.* (2004) indicate that, firstly SVM analytical method achieved better accuracy in prediction credit ratings than BNN method. Secondly, models that use a small set of financial variables perform better and even offer good results (in some cases) than other models that employ a large set of the same variables.

For the support of non-linear models and in contrast of the above result by Huang *et al.* (2004) regarding Neural Network technique, the following study introduced the effectiveness of non-linear models as compared to linear ones in forecasting credit

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[11] The financial ratios that were found significant (at the 1% level) throughout 1999, 2000 and 2001 by the study of Doumpos and Pasiouras (2005) are as follows: Current ratio, Quick ratio, Solvency ratio, Net profit margin, Return on total assets, Interest cover, Creditors payment (days), Gross profit margin, EBIT margin and EBITDA margin.

ratings. Kumer and Bhattacharya (2006) did a comparative study between non-linear and linear models to predict corporate credit ratings. They compared Artificial Neural Networks (ANN) model against Linear Discriminant Analysis (LDA) model, using Moody's long-term ratings. They employed 25 financial and accounting ratios on a sample of 129 companies covering various sectors over the period 2003-2004. Their results clearly indicate that ANN is more robust in dealing with missing data and complex data sets and it does not require various assumptions like linearity and normality, for that, they confirmed that ANN works better and it may be a good approach than LDA in corporate credit rating forecasts.

There are a few empirical studies that have attempted to estimate the determinants of municipal bond ratings such as; Farnham and Cluff (1982, 1984), and Loviscek and Crowley (1990). An early study by Gentry, Whitford and Newbold (1988) predicted industrial bond ratings using n-chotomous multivariate probit model with funds flow components and financial ratios. The main objective of their study is to employ cash flow components in order to classify and estimate industrial bond ratings for new offerings and reclassified bond issues. The model they use to identify funds flow measures was developed in 1982 by Erich Helfert; they redesigned that model in their previous studies (see Gentry, Newbold and Whitford; 1984, 1985b) to include 12 major components[12]. Besides these components, six financial ratios[13] from Pinches and Mingo (1973) were used in classifying and estimating bond ratings

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[12] Twelve funds flow components that redesigned by Gentry, Newbold and Whitford (1984, 1985b) and used in their study in (1988) are as follows: operations (NOFF), accounts receivable (ARF), inventory (INVF), other current assets (OCAF), accounts payable (APF) and other current liabilities (OCLF), financial (NFFF), fixed coverage expenses, i.e., interest and lease payments (FCE), capital expenditures (NIFF), dividends (DIV), other asset and liability flows (NOTHER), and the change in cash and marketable securities (CC).

[13] Gentry, Newbold and Whitford (1988) adopted six financial measures from Pinches and Mingo (1973), these are as follows: (1) subordination, (2) amount of the issue in dollars, (3) debt ratio, (4) cumulative years that dividends were paid, (5) net income/total asset, and (6) net income/interest.

in 1983 and 1984. They used Moody's assigned rating for all industrial bond offerings as Moody's rated 127 new issues in 1983 and 155 new issues in1984. In addition, all industrial bonds that were reclassified by Moody's in both years were included in their sample. The main findings of Gentry, Whitford and Newbold (1988) show that five out of twelve funds flow components, namely; inventories, other current liabilities, dividends, long-term financing, and fixed coverage expenses are significant in predicting the bond ratings of reclassified issues. They also show the probability tests pointed out that financial ratios and funds flow components have significant and positive impact on enhancing the n-chotomous multivariate probit model to classify new and revised bond ratings.

Another study is constructed by Badu and Daniels (1997) who employed ordered probit model, to investigate the determinants of municipal bond ratings in Virginia for the cross-sectional data of 1993. They have included several explanatory variables that represent four general categories as used in the international rating agency (Moody's), these categories are as follows: (1) debt factors (2) financial factors (3) administrative factors, and (4) economic base factors. Their model correctly predicts over 70% of the original sample and gives attention to the important factors that determine bond ratings. Their findings signify that the economic base variables (capital expenditures to the revenue ratio, the real estate tax rate and the revenue per capita) are crucial determinants of municipal bond rating in Virginia, and they are considered to be the most significance element in determining bond ratings.

3.4 Summary

As mentioned before, credit rating agencies publish their rating methodologies, yet their underlying assumptions and weighting of factors remain undisclosed. While this chapter has covered a variety of studies that have assessed credit rating agencies on different perspectives, e.g., Morgan, 2002; Iannotta, 2006; Cantor and Packer, 1994; Shin and Moore, 2003 and Bissoondoyal-Bheenick, 2004.

This study adds to the literature by confirming previously known factors that predict banks' and countries' credit ratings, while also providing an interesting insight into which factors influence banks' ratings compared to factors that influence countries' credit ratings. The two differ significantly at times.

Moreover, this chapter includes several empirical studies that have developed models to estimate sovereign (country) ratings. For example, an early study by Cantor and Packer (1996), examined the determinants of sovereign ratings.

This chapter has also reviewed a good number of empirical studies that have analysed and estimated the determinants of bank credit ratings. Poon, Firth and Fung (1999) examined Moody's bank financial strength ratings, focusing on bank's characteristics. Further studies by Poon (Poon, 2003; Poon and Firth, 2005; Poon, Lee and Gup, 2009) concentrated on the subject of unsolicited ratings, but includes assessments of bank rating determinants as well. Pasiouras, Gaganis and Zopounidis (2006) analysed non-financial factors, namely bank regulation, supervision and market structure, in addition to bank characteristics as determinants of Fitch's individual bank ratings.

From the above explanations, a multitude of diverse factors have an impact on bank's and country's ratings respectively. Factors that affect sovereign ratings may be considered influential for bank credit ratings, since economic indicators for banks' credit ratings are derived from sovereign ratings (Le Bras and Andrews, 2004). In addition, Poon (2003), Poon and Firth (2005) and Poon, Lee and Gup (2009) found a significant positive relationship between sovereign ratings and banks ratings.

Evidently, not only bank-level variables but also indicators in the bank's environment have a crucial influence in assessing the creditworthiness of banks. Financial ratios express banks' viability. A good financial position enhances banks' credit rating. Profitability, liquidity and asset quality in particular fundamentally affect ratings. Moreover, studies support the positive influence of bank size on ratings. Concerning the banking environment, banks that operate in a strong institutional, macroeconomic and political environment are attributed a higher creditworthiness by the agencies. Particularly output, economic growth and inflation shape the sovereign ratings of countries, and consequently also determine the rating of banks. With reference to the governance indicators, bank ratings would be influenced positively when countries having strong political and legal environment that is well developed and in a stable situation without any conflict or political crises. Furthermore, features of the regulatory and supervisory environment add to the soundness of the banking sector and affect the assessment of creditworthiness.

Additionally, Grunert *et al.* (2005) found significant results of the combined use of financial and non-financial factors which leads to a more accurate prediction of

default events. In addition, the conclusions drawn by the studied focusing on financial variables were contradicted by Bissoondoyal-Bheenick (2005) who revealed that financial and economic variables on their own are insufficient to determine sovereign ratings. Similar conclusions have been drawn by Gonis, Paul and Wilson (2012) who argued that the inclusion of non-financial variables provides a better explanation for the credit rating. Building on these conclusions, the study conducted by Butler and Fauver (2006) emphasised the quality of legal environment as the most significant factor predicting credit rating of a country. Concerning existing literature on credit ratings, the combined analysis of financial bank variables as well as non-financial indicators such as; macroeconomic, political and regulatory and supervisory lacks sufficient studies.

There is no study has been exploited the above variables in one study for MENA region. So far, there has been only one study (Pasiouras *et al.*, 2006) in the literature that employed non-financial factors including; regulatory and supervision, and market structure along with the bank-level accounting and financial characteristics to estimate the determinants of Fitch assigned bank ratings. Most of other studies reviewed have used the country economic variables along with the bank-level accounting and financial characteristics to estimate sovereign and bank rating models. Therefore, this study will make use of the following variables (financial bank characteristics, country economic, aggregate governance and regulatory and supervision) in the analysis to estimate rating models for MENA countries and its commercial banks.

Finally, there is no study has been predicted together sovereign and banks credit ratings for MENA region alone. However, the following studies (Butler and Fauver, 2006; Afonso *et al.*, 2007; Kim and Wu, 2008) have contained a few countries of MENA region in their panel data to assess the determinants of sovereign ratings assigned by different agencies. Other empirical studies such as (Poon and Firth, 2005; Pasiouras *et al.*, 2006) include some countries within MENA region in their samples to analyse the determinants of banks ratings. The majority of all the above studies are focusing on European countries, the USA and the UK for the purpose of estimating sovereign and banks rating models.

CHAPTER 4
RESEARCH METHODOLOGY

4.1 Introduction

This chapter is designed to evaluate the research methods, statistical and econometric techniques that are going to be employed in examining the importance of bank level and country level data on the credit ratings of MENA over the period (2000 – 2012), in order to find suitable models for the estimation.

The research design of this study requires careful consideration. It can be defined as a general plan of how to approach finding the answers to the particular research questions of the study (Saunders, Lewis and Thornhill, 2009). This chapter provides a description of the research philosophy, stages and approaches as well as the types of research data collection methods. Then it outlines an overview of the dependant and independent variables that were identified as potential determinants for the estimation of credit ratings models. Finally, it discusses of the statistical procedures (e.g. linear regression, logit and probit) that are going to be used for the estimation.

4.2 Research Philosophy

Research can be implemented in systematic and certain ways, but the subjects of investigation are varied, and the differences between these subjects need to develop

systematic approaches that lead to appropriate inference based on results and outcomes. There are different types of approaches to research methodology, which do not necessarily have to be followed separately. In this context, the deduction approach denotes the testing of theory; the induction approach refers to the building of theory (Saunders, Lewis and Thornhill, 2009).

An early study by Perry (1998) explained these major approaches, which concluded that positivism paradigm is deductive approach which means adopting and developing academic theories through testing and examining those adopted theories; in other words, a proposition is made in the research which is then tested for its truth. Whereas, inductive paradigm involves the formation of theory, this could be described as generating an un-existing theories and building new theories during the research process by depending on the research area and its circumstances. Furthermore, Jennings (2001) described positivism as the scientific system is being guiding and controlling the world which clarifies the performance of casual relationships.

Explaining the relationship between bank/sovereign ratings and diverse variables is the focus of this study. For this purpose the previous literature has been scrutinised and subsequently a number of variables were identified to be the potential determinants of ratings. With the theory thus established, data has been collected and accordingly will be analysed in order to investigate the impact of these variables on credit ratings. To accomplish the aim and specific objectives of this research as previously discussed, the theory testing as a perspective of this research will be required; therefore it will include a deductive approach.

4.3 Research Stages

"*A research design is the framework for getting from here to there where here may be defined as the initial set of questions to be answered and there is some set of conclusions (answers) about these questions*" (Yin, 2003). There are many different research strategies to select from when writing a thesis. However, the choice of strategy should be depend on the research objectives or questions (Yin, 1994). This section intends to discuss and shed light on the techniques for estimating credit rating models.

Each type of study has its advantages and limitations, depending on what the researcher wants to examine, the choice of study also may differ. On the other hand, Yin (1994) classified the research into three basic purposes: exploratory, descriptive and explanatory. The latter kind of study aims to discern casual relationships between variables (Yin, 1994; Saunders, Lewis and Thornhill, 2009). This study may be called explanatory because of the relationship between bank-level and country-level data and bank credit rating which is going to be examined.

4.3.1 Exploratory Stage

A research is designed to allow the researcher to understand the whole aspects of research area with respect to some phenomenon. In addition, an exploratory research approach allows for continuous adjustment for more understanding of the subject which was generated. The research should be as flexible to provide guidance for procedures to be employed during the next stage.

4.3.2 Descriptive Stage

The aim of this stage is to develop accurate descriptions of patterns that were investigated in the exploratory research. The purpose here comes out with intersubjective descriptions (e.g. empirical generalisations) which will lead to theory development in the long run.

4.3.3 Explanatory Stage

The purpose of this stage is to develop theory clearly which could be used to explain the empirical generalisations that emerged in descriptive stage (Reynolds, 1971). Moreover, Yin (1994) explained that the explanatory research is a casual research; it should be used to illustrate a certain set of events and explain how the investigation may apply to other investigations.

However, based on the research objectives involved and accordingly the overall purpose of this study will go through the process of these three stages; exploration, description and explanation. The researcher is going to explore what the purpose brings up, to describe what is brought up with the research objectives and to explain since when the conclusion to be drawn by analysing the related data in choosing the best models.

4.4 Research Data Collection Process

In research a distinction is made between primary and secondary data. The former refers to the collection of new data for the purpose of a particular research, whereas the latter has already been collected for other purposes (Saunders, Lewis and Thornhill, 2009).

4.4.1 Primary Data Sources

Primary data collection is necessary when a researcher cannot find the data needed in secondary sources, however, usually primary data is collected for a particular purpose and should be collected in conjunction with secondary data (Saunders *et al.*, 2007).

According to Yin (1994), there are several primary research strategies in the social sciences; questionnaires, interviews, experiments, surveys, archival analysis and case studies. Which of these strategies that is most suited for any particular study, depends on the type of research question, the degree of control, and whether the study has its focus on contemporary events.

Furthermore, Yin (1994) stated that a case study approach should be used when how or why questions are being posed about existing events over which the researcher has little if any control. He further explained that documentation in case studies is essential because the overall documents results support and corroborate evidence from other sources to the research, although, systematic searches for appropriate documents are important in data collection. Also, Yin (1994) confirmed that archival records are essential and could be in the form of service and organisational records, charts and lists, surveys and personal records, these and other archival forms can be utilised to support case studies analyses.

However, the application of an experiment is not appropriate in this study because we have no intention to investigate cause/effect relations, which an experiment is often used for. Another reason for not selecting experiment is that it demands control

over behavioural event, which is not possible in a study like this. However, a survey is also not suitable since it would have limited the investigation because the researcher would not be able to study the selected area in details.

4.4.2 Secondary Data Sources

Secondary data comes in various forms. Data regarding the market and its trends can be available from the external sources. Internal data provides information about the organisation, its type, its culture, employees and ethics. According to Saunders *et al.* (2000), secondary research includes two types of data, raw data and published summaries but the pitfall of using raw data is that a researcher has low control over the data collection process, while published summaries does not provide the process of data collection and hence explanation of the analysis will provide the results.

There are some benefits of using secondary data, this summarised as follows; it will save time from collecting raw data, it is economical as it will save travelling expenses, it will help in the better understanding of the basic objectives of the research and it will provide a wide choice of data collected by various researchers in any field.

The use of secondary data could be utilised based on related articles, official websites, annual reports, historical and official documents, newspapers, archival records and published statistics which will provide most of the important secondary data. Tellis (1997) indicated that not all sources are essential in every research, but it is important to use more than one source of data to enhance the research reliability, meanwhile Yin (1994) emphasised that "*A major strength of case study data*

collection is the opportunity to use many different sources of evidence", also data may not be available in previous and historical studies which persuade researchers to develop their own method to gather and organise investigative data (Rowley, 2002).

Due to the nature of this research, the secondary data will be extensively used such as the online data which is partly available on the International Monetary Fund (IMF) and The World Bank websites. A number of reasons justify why this research relies solely on secondary data; first, the credit ratings themselves are a product of the rating agencies. Second, country-level data that concerns the macro-economy, regulation and supervision and governance have been compiled by international institutions. Also, Bank specific data includes financial figures and ratios; these are processed by the banks themselves, and recorded in the financial statements as part of their annual financial reports. Because this research is of secondary nature it does not face specific ethical issues. The study relies on published and publicly available data and does not utilise confidential information. Furthermore, it involves neither sensitive issues nor vulnerable groups or individuals.

4.4.3 Qualitative and Quantitative Approaches

The best research method to use for a study is based on the research problem and research question (Yin, 1994). According to Saunders *et al*. (2009), two different methodological approaches are used in the social sciences; these types consist of qualitative method which denotes the generating of non-numerical data, whereas the generating or use of numerical data is classified as quantitative method. Both of these methods have different approaches, tools and techniques. Moreover, data

collection techniques and data analysis procedures in a research can be categorised into different groups.

Some researchers have indicated that the research strategy which is based on a case study requires using qualitative method of research (Rowley, 2002; Yin, 1994). Using a qualitative approach is appropriate of getting a deep knowledge about the topic, but since the social world in business is complex and unique then it is difficult to theories in the same way as the physical science (Saunders *et al.*, 2000). On the other hand, a quantitative research is considered the only method that gives an objective truth, because it converts information into numbers, and represents the real facts about the research objectives, so this method should be used when the researcher conducts investigation that contains many units (Reynolds, 1971). Also, it is important to apply this method when there are some measurement dimensions which need to be investigated by quantitative tools (Saunders *et al.*, 2000). Moreover, Ghauri *et al.* (1995) noticed that once comparing qualitative and quantitative approaches, the qualitative one is much more elastic and unstructured.

Since part of the data in this research deals with qualitative shape, this requires transforming these information into values in order to make the analysis possible. In support with this, Sekaran and Bougie (2010) recommended that the researcher should transfer any kind of data to a much easy form once it is gathered, so that the findings can be produced easily clearly and accurately. It is worth to mention here that this research implies using both qualitative and quantitative methods to collect the required data for estimating countries and banks credit ratings.

In details, credit ratings reflect the rating agencies' opinion of creditworthiness. In particular, they depict a relative ranking of creditworthiness, expressed in letters. Ratings, thus, may be described as a qualitative ordinal measure (Afonso, Gomes and Rother, 2007). Furthermore, the assessment of creditworthiness of a bank is not only of quantitative but also of qualitative nature. While rating agencies process quantitative financial data amongst others, they additionally consider aspects such as management and strategy, which is a rather subjective evaluation (Les Bras and Andrews, 2004; S&P, 2004a, 2004b; Vuong, 2007). It is however, not in the scope of this work to analyse this qualitative aspect of credit ratings. What is more, records used for the regulatory and supervisory environment were only available in qualitative form since they had not been quantified in their initial survey which formed by Barth, Caprio and Levine (2001). These qualitative data (regulatory and supervision variables and ratings from international agencies) needed to be transformed into quantitative values, in order to be analysed and reflected their influence on estimation rating models. The transformation of these variables is explained further in a later section.

Furthermore, with regards to the quantitative data collection techniques and data analysis procedures, there are different types of quantitative data (Saunders, Lewis and Thornhill, 2009). The majority of explanatory variables that are going to be examined as factors of ratings in the analysis are numerical data, covering e.g. banks' financial ratios and macroeconomic data.

Nevertheless, sole quantitative data contains little meaning. Thus, there are quantitative analysis techniques such as statistics to examine relationships between

variables, which enable the conversion of data into information (Saunders, Lewis and Thornhill, 2009). This is why in the analysis i.e., the relationship between bank-level and country-level data on one side and bank credit ratings on the other side will be statistically analysed in order to assess the impact of these factors on ratings.

4.4.4 Validity and Reliability

According to Jennings (2001), "*Validity refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration*", also Jennings (2001) stated that there are several types of validity:

- Face validity which means that the subject is being measured appropriately.

- Criterion – related validity: it is connected with founding measures that will expect future results in association to specific criteria; it is used when determining performance or ability.

- Content validity refers to employment of actions that integrate all of the meanings connected to the study, so, the data collected should contain high content validity.

- Finally, construct validity evaluates the summaries of collected data depending on several indicators, which are based on valid theories such as, Maslow hierarchy to obtain various motivation indicators.

On the other hand, Judd *et al.* (1991) clarified that "*Reliability entails consistency and freedom from random error of the scores obtained by a measurement technique*". When researchers engage in a study particularly involves quantitative method and

data analysis process, they should involve reliability to include low frequency of random errors to avoid any replicated results.

Credibility is always essential in a qualitative and quantitative research. Researchers are required to seek for valid and reliable data in order to minimise defaults and errors. However, there will always be a doubt of reliability in case of secondary research, and there will also be concerns and risk that the application of data is outdated and no longer valid. Therefore, for secondary data research a health check should be made on the validity and reliability of the research data for the purpose of presenting more sensible, accurate and transparent results. In doing so, the best efforts will be made and care is going to be taken to ensure that the data used in this research is authenticated, collected from reliable sources, valid and up to date.

4.4.5 Presentation of the Data

Miles and Huberman (1994) described data analysis activities "*Consisting of three concurrent flows of activity, data reduction, data display and conclusion drawing verification*", these are presented as follows:

- Data reduction

It is a major process of the analysis, which assists and organises the data in order to present an explained conclusion by reducing and transforming the data collected, so in this research, the data collected is compared by the existing literature which will help the researcher to reduce unnecessary data.

- Data display

In this stage, the summarised data is displayed in organised manner, which will provide further assistance for data reduction.

- Conclusion drawing verification

In this stage, the researcher will be able to analyse, interpret and draw conclusion based on deeper understanding of the data collected.

4.5 Identification of Variables and Research Sample

This section will briefly explain the initial sample of this study and outline the sources of collecting the required data; however, the detailed samples for the estimation will be discussed later in Chapter (5) country rating models and chapter (6) bank rating models. Due to the inclusion of country-specific indicators in addition to bank characteristics, it was beneficial to consider banks from more than one country. Ultimately, MENA countries and their commercial banks were chosen based on data availability of the credit ratings in the Reuters databases. The next sub-sections will explain the sources of collected data for the above variables and it will further elaborate on the variables chosen to be examined in the analysis.

4.5.1 Dependent Variables

The database Thomson Reuters Eikon has been discovered as a source for collecting data on historical sovereign and bank ratings. It additionally served as a source for financial figures and ratios of banks. However, while ratings of specific banks and countries were accessible, related company data could merely be

acquired for the respective banking group or holding company. Furthermore, a number of countries and banking firms had to be excluded due to insufficient data concerning credit ratings. Ultimately, the final sample consisted of 108 commercial banks covering 13 MENA countries. The observed time period spanned over the years 2000 to 2012.

The credit ratings that are chosen as dependent variables based entirely on long-term issuer (foreign) ratings from Standard and Poor's (for sovereign ratings) and from Fitch (for banks ratings). However, long-term issuer (local) rating is an alternative type to be used in case of the unavailability of data for some years. While both agencies distinguishes between domestic and foreign issuer ratings, most the observed cases domestic and foreign ratings were identical, which made a distinction for the analysis redundant. In case a rating change by Standard and Poor's and Fitch occurred at a date during the first two months of a year this new rating has been attributed to the preceding year for the analysis.

4.5.2 Independent Variables

Meinster and Elyasian (1994) and Sabi (1996) observed that the bank regulators, for example, use financial ratios to assess bank's performance. Previous research has identified a number and mixture factors that influence bank credit ratings. Figure (4.1) illustrates an example of the financial and non-financial variables that are going to be examined for the estimation of country and bank rating models.
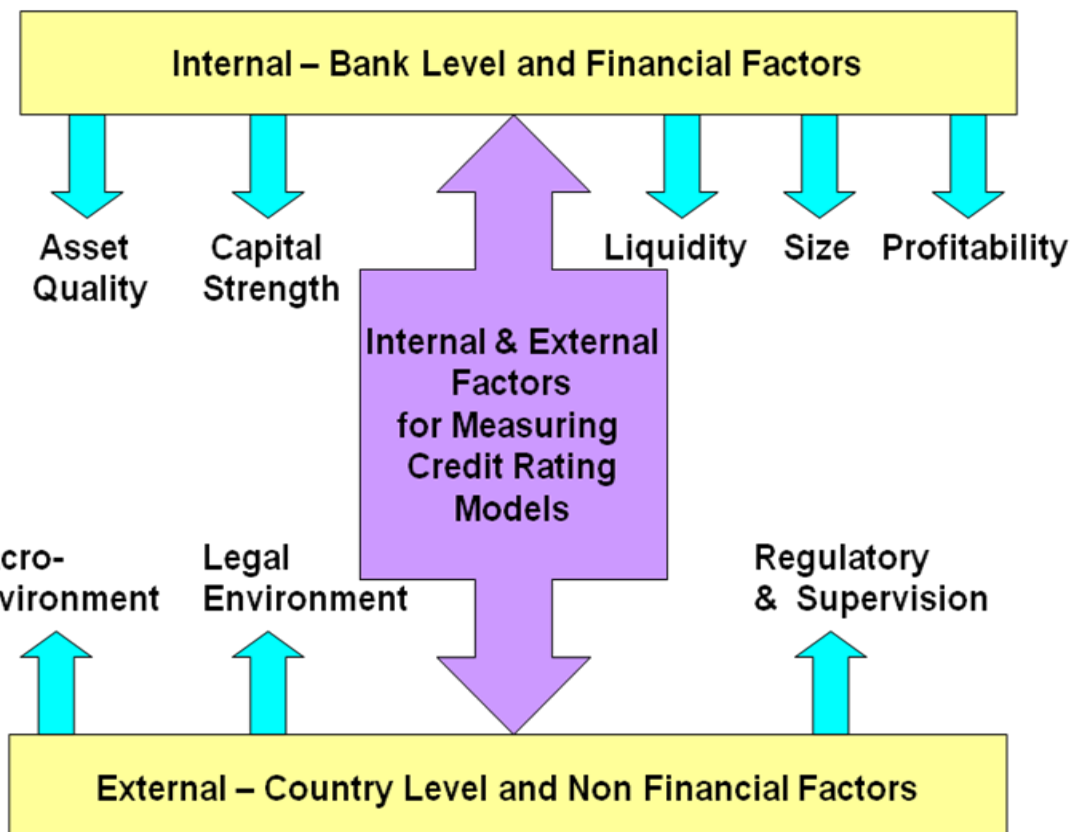
Figure (4.1): Financial and Non-Financial Indicators

4.5.2.1 Internal-Financial Factors

Palepu *et al.* (2000) noticed that the financial statements of any corporation summarise the economic consequences of its business actions. Financial statement analysis is the most significant part of the fundamental analysis which also known as quantitative analysis; it involves looking to historical performance data in order to estimate the future performance. Additionally, Fundamental analysis implicates the study of an organisation's processes and assets in an effort to verify its essential value. Changes in these fundamental realities are used to give details on the forecast of market moves.

Financial ratios are considered as one of the investment analytical tools for investors in valuing the company's performance based on traditional fundamental analysis because it measures the returns and risks. Also it compares the connected figures from financial statements to express past and present performance of the company. Ratio analysis (e.g. profitability, liquidity and gearing) has many objectives, it is employed in this research to assess and evaluate the bank's ratings, performance and position. The purpose of some of these broad categories of ratios is summarised as follows:

- Profitability ratios: It shows if the company is making a satisfactory profit or not.
- Liquidity ratios: It focuses on the bank's short term liability and the ability of the bank to pay its short run liabilities.
- Gearing ratios: It measures the bank's ability to meet its long term liabilities.

Moreover, an essential part of the assessment of creditworthiness by the rating agencies concerns the bank characteristics such as **financial figures**. In particular, **asset quality** proves to be influential. In order to analyse the asset quality of banks, consideration is given to their loan portfolio. Loan provision ratios have already been discerned as determinants of bank ratings. Furthermore, **profitability** may be measured through various financial ratios. Previously, return on average assets has shown to have an impact on ratings. Additionally, **bank size** has consistently been identified as a significant factor for banks' credit ratings. Despite the importance attributed to **capital strength** for banks, capital structure variables have not been identified in previous research as determinants of bank ratings. Similarly, evidence

about **liquidity** is mixed. A further analysis of the above factors may provide further insight on estimating bank ratings.

Bank level accounting and financial data (including profitability, capital strength, asset quality, liquidity and size) is drawn from Bankscope, as used by Pasiouras *et al.* (2006). Bankscope Database of Bureau van Dijk's, which is specialised database that contains information for approximately 12,000 banks around the world. The following Table (4.1) gives an overview of the bank-level variables that is going to be analysed.

Table (4.1): Description of the Financial Ratios and Bank-Level Variables

Variable	Category	Description
Operations		
NTM	Net Interest Margin	Net Interest Income/Interest Earning Assets
ROAA	Return on Average Assets	Net Attributable/Average Total Assets
ROAE	Return on Average Equity	Net Attributable/Shareholders Equity
COST	Cost to Income Ratio	Operating Costs/Total Income
Capital		
CAPITAL	Total Capital Ratio	Tier 1 + Tier 2 Capital/Risk-adjusted Assets
EQAS	Equity / Total Assets	Tier 1 Capital/Risk-Adjusted Assets
CAPLY	CAP Funds / Liabilities	Total Capital Funds / Total Liabilities
Asset Quality		
LOAN	Loan Loss Res/ Loan	Total Loan Loss Reserves / Gross Loan

Liquidity

NLASS	Loan / Assets	Net Loans / Total Assets
NLDEPOST	Loan / Dep Funding	Net Loans / Deposit (Customer) and Short Term Funding
LIQ	Assets / Dep Funding	Liquid Assets / Deposit (Customer) and Short Term Funding

Size

LGASS	Bank Size	Logarithm of Total Assets

In details, profitability is recognised to be crucial for a bank's long-term viability. Banks that have a low profitability are more vulnerable to adverse situation than healthier banks. High profitability, in particular a high return on assets, has been associated with higher bank ratings in previous studies. From Bankscope database four profitability ratios could be acquired: Return on Average Assets (ROAA), Return on Average Equity (ROAE), Net Interest Margin (NTM) and Cost to Income Ratio (COST).

In addition, capital strength is fundamental for banks as a protection against insolvency. Considering opposing and mixed results of previous research, an investigation into the influence of capital ratios in the analysis might provide further insight. The Equity to Total Assets (EQAS) ratio will be included in the analysis as a capital structure variable. Additionally, Bankscope provided the ratios Tier 1 capital (TIER1) and Total Capital (CAPITAL), which refer to capital adequacy defined by the Basel Committee. The total capital ratio is calculated as total capital (Tier 1 and Tier 2) to risk-adjusted assets. This ratio must not be lower than 8%. Likewise, Tier 1

capital ratio is determined as Tier 1 capital to risk-adjusted assets (BIS, 2006). The special role of asset quality and its importance along with the liquidity for banks are recognised in previous studies. These ratios have also been utilised in order to determine a potential influence on bank credit ratings.

However, bank size has been an important determinant of bank credit ratings in earlier literature. Even though some researchers argue that larger banks are not necessarily safer and may engage in riskier behaviour, a positive relationship between bank size and credit ratings was discerned in previous research. In the analysis bank size has been determined in accordance with earlier studies as the Logarithm of Total Assets (LGASS).

4.5.2.2 External-Non Financial Factors

On the other hand, factors of the banking environment were identified in previous research to affect the ratings of sovereigns and banks. Among **macroeconomic variables** such as; GDP (per capita), GPD growth and inflation have been shown to be important determinants of country ratings and thus will have an influence on bank ratings too. Furthermore, the impact of **political and legal environment indicators** may be determined through factors that measure political stability, government effectiveness or the rule of law. A variety of aspects in the **regulatory and supervision variables** may influence the credit rating agencies' assessment of banks' creditworthiness, for instance the existence of deposit insurance schemes, restrictions on banks activities and capital adequacy requirements. Figure (4.2)

describes an example of external factors that have been chosen to serve the estimation of country and bank rating models.
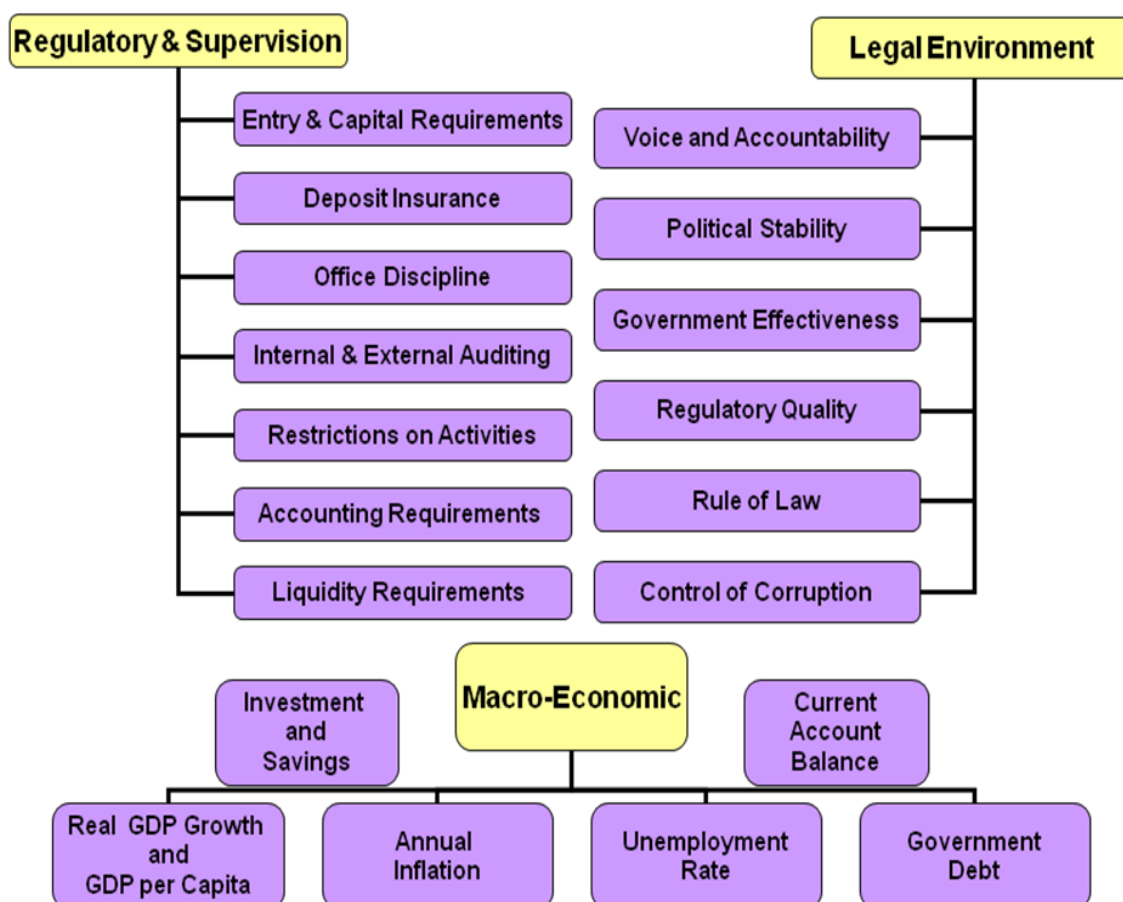
Figure (4.2): Description of Non-Financial and Country-Level Variables

4.5.2.2.1 Macro-Economic Factors

Both the rating agencies' bank rating methodologies and previous literature reveal specific macroeconomic factors to be determinants of credit ratings. Additionally, a number of macroeconomic variables have been found to have an influence on banking stability and soundness. Data for the macroeconomic indicators for this study has been extracted from the International Monetary Fund's World Economic

Outlook Database, October 2013. The following Table (4.2) provides more details on the macroeconomic variables that are going to be examined in the analysis.

Table (4.2): Macroeconomic Variables from IMF World Economic Outlook

Variable	Category	Description
RGDPG	**Real GDP Growth**	Annual Change of Gross Domestic Product (Constant Prices)
GDP	**Gross Domestic Product**	GDP per U.S. Dollars Billions, current prices (National Currency)
GDPCAP	**GDP per Capita**	Gross Domestic Product per Capita in U.S. Dollars (Current Prices, National Currency)
INVST	**Total Investment**	Gross Capital Formation at Market Prices as Percentage of GDP
GNSAV	**Gross National Savings**	Gross National Savings as Percentage of GDP
INFL	**Inflation**	Annual Percentage of Average Consumer Price Index
UNEMP	**Unemployment Rate**	Unemployment as Percentage of Total Labour Force
GOVNDEBT	**Government Net Debt**	General Government Net Debt as Percentage of GDP
CURRACC	**Current Account Balance**	Current Account Balance as Percentage of GDP

4.5.2.2.2 Political and Legal Indicators

Kaufmann, Kraay and Mastruzzi (2009) define governance as "*The traditions and institutions by which authority in a country is exercised*", specifically they refer to: "*The process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them*".

The political and legal environment of a country has a considerable impact on the stability of its banking system. In order to determine the influence of these indicators, expressed as estimate of governance performance from the Worldwide Governance Indicators Database (2013 update) have been included in the analysis. The database was developed by Kaufmann, Kraay and Zoido-Lobaton (1999), and has also been utilised by e.g. Alexe *et al.* (2003). The following Table (4.3) gives more demonstration on the dimensions of aggregate governance indicators that will be included in the analysis.

Table (4.3): World Governance Indicators by Kaufmann, Kraay and Mastruzzi (2010)

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4.5.2.2.3 Regulation and Supervision Variables

Previous research has analysed the influence of the regulatory and supervisory environment on bank credit ratings as well as its impact on bank risk-taking and banking stability and soundness in general. The database of the World Bank Regulation and Supervision is based on the work of Barth, Caprio and Levine (2001).

The following Table (4.4) illustrates the type of variables as well as questions concerning the regulatory indicators.

Table (4.4): Regulatory and Supervisory Variables from World Bank Database, Barth *et al.* (2004b)

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4.6 Statistical Methods

Two statistical approaches can be discerned in research that investigates determinants of credit ratings (see e.g. Afonso, Gomes and Rother, 2006). One strand of literature utilises a linear regression model, specifically an ordinary least square analysis on a numerical, linear representation of the ratings, e.g. Cantor and

Packer (1996), Monfort and Mulder (2000), Alexe *et al.* (2003), Canuto, Santos and Porto (2004). The other strand of literature analyses credit rating determinants by applying an ordered response framework. While some researchers make use of an ordered logit model, e.g. Poon, Firth and Fung (1999), Pasiouras, Gaganis, and Zopounidis (2006), others employ an ordered probit model e.g. Badu and Daniels (1997), Shin and Moore (2003), Bissoondoyal-Bheenick (2005), Grunert, Norden, Weber (2005), Bootheway and Peterson (2008).

The methods this study will be applying in analysing credit rating in countries and banks are two major frameworks namely; the linear regression framework and the ordered response framework inclusive of the logit and probit models. Linear regression framework measures ratings in linear relationship on various financial metrics while the ordered response framework relaxes the assumption of a linear rating scale by adding endogenously determined break points against which a similar fixed coefficient linear index is measured (Mertz and Cantor, 2006). These two models have advantageous in the computation and implementation during the analysis. Although these methods have been successful in analysing different samples of previous researches, still some setbacks have been occurred depending on the data size and availability.

4.6.1 The Linear Regression Framework

Statistical methods used by quantitative researchers in carrying their study have recorded success over the years. Linear regressions that happen to be one of the statistical methods have dominated the quantitative research market. Monfront and

Mulder (2000) and Mora (2006) generalised linear regression framework as the following:

$$R_{it} = \beta X_{it} + \lambda Z_i + \partial_i + \mu_{it}$$

Where;

R represents the quantitative variable that is attained by a non-linear or a linear alteration. X_{it} stands for the vector contains factors that include variables which vary during a period of time. Z_i refers to the vector of time invariant that includes regional models. In addition, the index i $(i=1,...,N)$ is a symbol of the country while the index t $(t=1,...,T)$ symbolizes the time period and ∂_i represents the distinct effects of countries i (it can be seen as a model to be assessed). Also μ_{it} characterises independent variables for countries.

Moreover, by means of a regression analysis a predictive model is fit to collect the required data. With this model values of the dependent variable (the outcome variable) can be predicted from one or more independent variables (explanatory variables). Field (2005) defined linear regression as a linear model to fit and generalise the trend of collected data, i.e. a line is determined that summarises the general trend of the data. Asteriou (2006) presented the simple multiple regressions in an equation which is given as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1_{it}} + \beta_2 X_{2_{it}} + ... + \beta_k X_{k_{it}} + \varepsilon_{it}$$

The given equation contains a number of cross-sectional units $(i = 1,2,...,n)$ that are observed at different time periods $(T = 1,2,...,T)$, and thus represents a panel dataset. For example, to the benefit of this research, Y_{it}, is the dependent variable as a vector of banks and countries credit ratings and $X_{K_{it}}$ $(j = 1,2,...,K)$ is the set of explanatory variables, i.e. bank characteristics, macroeconomic, governance as well as regulation and supervision indicators. There are different models of estimation for the given dataset, which will be elaborated on in the subsequent sections.

However, Afonso *et al.* (2007) evaluated the equation for Linear Regression in three methods namely:

- Pooled Ordinary Least Square method
- Fixed Effect method
- Random Effect method

The following sub-sections discuss the theoretical methodologies for the above three models. The underlying statistical underpinning is provided for each of these methods. Furthermore, the existing body of academic literature is reviewed in order to highlight the practical challenges that can be associated with individual estimation models.

4.6.1.1 Ordinary Least Square Method

To begin with, ordinary least squares estimation method focuses on the estimation of unknown parameters in a linear regression model. Its origins can be traced back to the end of the 18th century when it was developed as a statistical method by Carl Friedrich Gauss (Allen, 1997). The sum of squared vertical distances between the dataset values and predictions based on the linear approximation is minimised via this method. The estimation method represents one of the most commonly estimation techniques as it allows for the measurement of accuracy of the regression model. The key problems that can be associated with this estimation method as summarised by Allen (1997) relate primarily around outliers, non-linearities, too many variables and dependence among variables.

The Ordinary Least Square (OLS) method is a particular linear regression technique to find the line that best describes the analysed data (line of best fit)[14], (Field, 2005). The pooled OLS can be applied for datasets that contain both different cross-sections and time periods. This method assumes that there are no differences between the examined cross-sections and hence estimates a common constant (β_0) for all cross-sections. Underlying the application of this model is the a priori assumption that the dataset is homogenous (Asteriou, 2006).

---

[14] In order to find the line of best fit the least square method squares the residuals, i.e. the differences between the model fitted to the data and the actual data collected, and selects the line with the lowest sum of squared differences.

Least square as the name implies means minimizing the sum of squared error terms. OLS method is known as one of the oldest and simplest of all methods of linear regression (Abdi, 2003). The OLS method minimises:

$$\sum_{i=1}^{n} e_i^2 = e_1^2 + e_2^2 + ... + e_n^2$$

Where; we have a sample size of n.

From this we can see that OLS minimises $\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2$ which is the squared error between the actual and fitted values. Where; $e_i^2 = (Y_i - \hat{Y}_i)^2$.

Abdi (2003) also listed some features known as the Gauss-Markov conditions and theorem that are linked with OLS method and they are:

- The data in question must contain a random sample from a definite population.
- The population model must be linear.
- The independent variables must be linearly independent.
- The error must have a zero expected value.
- The error must be distributed and uncorrelated with independent variables.

However, Butler and Fauver (2006) used OLS estimates in which they used the same sample of countries and the same regressors, although they used the actual values of legal environment rather than the projected values in the OLS. The effect is smaller than OLS estimates indicate, although it is still quite large. The magnitude of

the coefficient on the legal environment variable drops and despite the drop, the coefficient is still statistically significant and the economic relevance is still quite large. Moreover, the standardized coefficient drops but it is still larger than the standardized coefficient on each of other variables in the regression. This standardized coefficient is based on the standard deviation of the instrumented legal environment composite. From the analysis of sovereign credit rating by Butler and Fauver (2006), it is evident that endogeneity matters enough to materially inflate the apparent impact of legal environment on sovereign credit ratings. However, even adjusting for endogeneity, legal environment is still an economically major determinant of sovereign credit ratings. It is still the largest single factor that we have identified as a determinant of sovereign credit ratings.

Moreover, the early study by Cantor and Packer (1996), applies OLS regressions to a linear representation of the ratings, on a cross section of 45 countries. This methodology was also pursued by Afonso (2003) and Butler and Fauver (2006). Using OLS regression analysis on a numerical representation of the ratings is quite simple, and this estimation sometimes is inappropriate, since OLS would consider the difference in the dependent variable between a 1 and a 2 as equivalent to the difference between a 2 and a 3. In addition, OLS technique allows for a straight forward generalization to the panel data by doing fixed or random effects estimation (Mora, 2006; Monfort and Mulder, 2000). Recently, Hampel *et al.* (2011) recognised that least square has a growing prevalence amongst researchers; however, they argued that it suffers from a dramatic lack of robustness. Any single outlier can have an excessive effect on the estimate (Galvao, 2011). In the previous literature OLS method was applied by e.g. Afonso, Gomes and Rother (2007), Canuto, Santos and

Porto (2004) and Monfort and Mulder (2000). However, these papers also employ additional specifications such as fixed effects and random effects.

4.6.1.2 Fixed and Random Effects Models

In contrast to pooled OLS, the fixed effects regression model assumes that the observed quantities of predicting variables are non-random; it is used in evaluating longitudinal data with recurring procedures on both independent and dependent variables. This method has a major attracting characteristic of controlling for all steady features of individuals (Allison, 2006). Fixed effect method offers unobserved differences between individuals as a set of fixed factors that can be either assessed directly or partially. According to Allison (2006), there are two requirements for using the fixed effect method. These include:

- Measurement of the dependent variable must be done at least twice for each individual. They must have the same result.
- Predictor variable must change in the measurement of each individual.

Fixed effects regression models are important because data often falls into different categories. The fixed effects method allows for differences among the data matrices of the cross-sectional dimension. This means, different constants for each section are estimated by including a dummy variable for each group. This method, however, suffers from some drawbacks. First, the degree of freedom is considerably reduced through the large number of dummy variables and thus inefficiency is increased. Secondly, time-invariant variables are not accounted for. Consequently, other

dummy variables cannot be utilised. Finally, independent variables that are slowly changing will be collinear with the effects to a high degree (Asteriou, 2006; Kennedy, 2003). Due to these problems associated with the fixed effects method, a contradictory approach often the random effects method is alternatively applied.

While the fixed effects model treats the constant for each section as fixed, in the random effects model the constant for each section is random parameters (Asteriou, 2006). Once a quantity is categorised as random, it means that it fluctuates and appears that a particular observed period based on chance. The same applies to statistical models when quantity is at random, it is known as drawing conclusions from observed units (Snijders, 2005). Under the random effect method, unobserved differences between individuals are offered as random variables with a stated possibility distribution (Allison, 2006). The analogue under the random effect method is that an interaction variable is obtained by multiplying the explanatory variable by the dummy variable for the units to be obtained (Snijders, 2005).

Moreover, random effect method permits a larger degree of freedom and consequently leads to more efficient estimators of the coefficients. Additionally, it allows for time-invariant independent variables (Kennedy, 2003). However, by this technique the estimates will be biased and inconsistent if the errors and independent variables are correlated. Furthermore, explicit assumptions have to be made about the distribution of the random effect. Ultimately, this method may be more appropriate for unbalanced panels, whereas the fixed method is more suitable for balanced panels (Asteriou, 2006).

The existing body of statistical literature highlights numerous shortcomings of the ordinal linear regression model. Laird and Ware (1982) pointed out the difficulties in applying general covariance structure to highly unbalanced data and recommended the use of a two-stage random effects model. Furthermore, the presence of a substantial downward bias in ordinal linear regression has been emphasised in the academic debate (Moulton, 1986; Moulton, 1990). Despite the theoretical foundations provided in the existing body of literature on random effect models (Box and Tiao, 1968; Hedeker and Gibbons, 1994), the study conducted Berkey *et al.* (1995) questioned the validity of random-effects regression models.

Nevertheless, Hedges and Vevea (1998) discussed two major categories of statistical procedures commonly used in meta-analysis - fixed and random effects models. Although these models are commonly considered as viable alternative, the authors highlighted the differences in their respective inference goals. While fixed effects models aim to make inferences regarding the effect parameters observed in the studies, the random effects models is based on making inferences regarding the distribution of effect parameters in a population from a random sample of studies (Hedges and Vevea, 1998). The authors conducted an in-depth analysis of the two families of statistical models and highlighted the need to understand their intended goals in order to apply them correctly in the analysis process. Furthermore, Hedges and Vevea (1998) reported that conditionally random-effect models, or a hybrid type, have properties of both fixed and random effects models. Similar conclusions can be found in the work of Greene (2005) who proposed extensions to circumvent the respective shortcomings of both fixed and random effects models. In essence, the inefficiency measures in the models might be increasing the heterogeneity and

decreasing the efficiency of the models. The outcome of the discussion encompassed in the work of Greene (2005) thereby extends the fixed effect model to a stochastic frontier model which adopts a non-linear specification. Furthermore, Greene (2005) considers the random effects model as a special case of random parameters model which enhances its efficiency.

Additionally, Afonso *et al.* (2007) analysed three evaluators and concluded that they are known to be stable and their ranking is efficiently clear. They analysed these methods under normal circumstances, where the country specific error is uncorrelated with the regressors, the random effects method should be applied while if circumstances are different from the normal, the fixed effects method should be used. They concluded that random effects method is preferred to the fixed effects method and that the fixed effects method is preferred to the pooled OLS method.

4.6.2 The Logistic Regression Framework

The other way to counter for linear regression framework is an ordered response models that used by the logistic regression framework. The foundation behind the application of these ordered response techniques lies in the ordinal, qualitative nature of credit ratings. As mentioned previously in the literature for the analysis of credit ratings, this method has been used e.g. by Bissoondoyal-Bheenick (2005), Bootheway and Peterson (2008) and Shin and Moore (2003).

An early study by Wiginton (1980) compared logistic regression with discriminant analysis and concluded that logistic regression completely dominates discriminant analysis. In statistics, Greene (2002) described the logistic ordered framework has

the dormant variable model. Based on this model, it is impossible to detect the correct value of the interest dependant variable Y and possible to detect the dependent variable Z which already contains information about variable Y. This ordered framework can be divided into two models namely:

- Ordered Logit Model
- Ordered Probit Model

The ordered logit model and the ordered probit model ensure and provide almost the same thing but the major difference is in their distribution. In case of the ordered logit model, there is an observed ordinal variable which is a function of another variable that is not measured. In this model, there is a continuous unmeasured dormant variable whose values define the ordinal variable value. The model is used to evaluate categorical outcome in order where some outcomes are greater than others. A significant limitation to this model is that the maximum probability requires the computation of normal integrals which is mostly carried out by simulation (Greene, 2004; Cappellari and Jenkins, 2003; Dardanoni, 2005).

4.6.2.1 Ordered Logit Model

The logit method that originates from the field of econometrics has been applied to ratings estimations by various researchers (e.g. Poon *et al.*, 1999; Pasiouras *et al.*, 2006). Considering the ordinal nature of the dependent variable, an ordered logit model has been argued to be appropriate to the modeling of ratings. We discuss very briefly the ordered logit model below while more detailed discussions can be found in Powers and Xie (2000) and Borooah (2001).

In general, logistic regression (sometimes called the logistic model or logit model) is used for prediction of the probability of occurrence of an event by fitting data to a logistic function. It is a generalised linear model used for binomial regression. Like other forms of regression analysis, it makes use of one or more predictor variables that may be either numerical or categorical. For example, the probability that a person has a stroke within a specified time period might be predicted from the person's information such as; age, sex and body mass index.

The logistic regression begins with an explanation of the logistic function which is used like the probabilities, that when dependent variables are dummy variables and always takes on values between zero and one. It estimates the possibility of dependent variables to be 1. Logit models have cumulative standard logistic distribution (Torres-Reyna, 2002). In the ordered logit analysis the probability of a bank to be estimated is based on a set of independent variables is given by the following function:

$$ f(z) = \left(\frac{e^z}{e^z + 1} \right) = \left(\frac{1}{1 + e^{-z}} \right) $$

The input is z and the output is f (z). The logistic function is useful because it can take as an input any value from negative infinity to positive infinity, whereas the output is confined to values between 0 and 1. The variable z represents the exposure to some set of independent variables, while f (z) represents the probability of a particular outcome, given that a set of explanatory variables. The variable (z) is

a measure of the total contribution of all the independent variables used in the model and is known as the logit. The variable (z) is usually defined as follows:

$$z_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + ... + \beta_k x_k \varepsilon + \varepsilon_i$$

Where;

Z_i is the probability that firm i will be estimated, β_0 is the intercept term and $\beta_k (k = 1,...,m)$ represents the regression coefficients associated with the corresponding independent variables $X_k (k = 1,...,m)$ for each firm, while ε_i represents the error term.

For example, Kaplan and Urwitz (1979) used ordered logit models to estimate credit ratings. The dependent variable is treated as a latent variable, because we observe the rating, but we do not observe the credit quality or default probability. The authors analysed the following variables: (i) Interest coverage ratios: cash flow before interest expenses and taxes divided by interest expenses; cash flow before interest expenses and taxes divided by total debt; (ii) Capitalization indices: total debt divided by total assets; long term debt divided by book equity; (iii) Size variables: total assets; issue size; (iv) Stability variables: coefficient of total asset variability; coefficient of profit variability; (v) Subordination: dummy variable indicating the subordination status; (vi) Market variables: beta coefficient and residual of the market model regression. According to Kaplan and Urwitz (1979), the specific risk or regression error can be interpreted as a proxy for management ability.

Some studies have found Logit model superior to other methods (Gu, 2002). This method potentially could give a better decision if compared to the distribution of financial risk using a model based on discriminant analysis (Boritz and Kennedy, 1995). However, recent studies (e.g. Shin and Lee, 2002; Abid and Zouari, 2002; Rahman *et al.*, 2004; and Pendharkar, 2005) predicted a bankruptcy using the logit model. In Malaysia, the applications of a logit model are done only in predicting corporate failures rather than for banking institutions. Most of the studies used working capital variables as discussed in the study by Mohamed *et al.* (2001).

4.6.2.2 Ordered Probit Model

Some researchers make use of an ordered probit model to estimate the determinants of credit rating models (e.g. Badu and Daniels, 1997; Shin and Moore, 2003; Bissoondoyal-Bheenick, 2005; Grunert *et al.*, 2005; Bootheway and Peterson, 2008).

The asymptotic properties of the ordered probit model hamper generalisations from a small sample, and a number of difficult adjustments are required for this approach (Afonso, Gomes and Rother, 2007). An ordered response models make the determination of the size of the differences between the single rating categories possible, they require careful consideration and various adjustments for a proper analysis (Afonso, Gomes and Rother, 2007). They stated that the ordered probit is a natural approach of the limited dependent variable framework. The rating is a discrete variable and reflects an order in terms of probability of default. Each rating agency makes a continuous evaluation of a country's credit-worthiness, embodied in

an unobserved latent variable R^*. This latent variable has a linear form and depends on the same set of variables as before, the setting is the following:

$$R^*_{it} = \beta(X_{it} - \overline{X_i}) + \delta\overline{X_i} + \lambda Z_i + \varepsilon_i + \mu_{it}$$

Wooldridge (2002) described two approaches to estimate ordered probit model. The first one is "quick and dirty" possibility, it is assumed with only one error term that is serially correlated within banks. Under that assumption one can do the normal ordered probit estimation but a robust variance-covariance matrix estimator is needed to account for the serial correlation. The second possibility is the random effects ordered probit model, which considers both errors ε_i and μ_{it} to be normally distributed, and the maximization of the log-likelihood is done accordingly. This second approach should be considered the best one, but it has a drawback of the quite cumbersome calculations involved.

Moreover, the Ordered Multinomial Probit (OMP) is used for estimation in the context of an ordinal polychotomous dependent variable. While taking into account the existence of a ranking, the OMP also assumes that the size of the difference between any two adjacent ratings is not known but does not matter to the carrying out of the analysis, unlike, for example, the usual regression techniques, where the size of the difference between adjacent elements is known and matters to the carrying out of the analysis (Cheung, 1996).

In general, credit ratings can be viewed as resulting from a continuous, unobserved creditworthiness index. Each credit rating corresponds to a specific range of the

creditworthiness index, with higher ratings corresponding to a higher range of creditworthiness values. Since the credit rating representation of creditworthiness is a qualitative ordinal variable, the estimation of a model for such a dependent variable necessitates the use of a special technique (Greene, 2002).

Consider the simple case of a qualitative unordered dichotomous dependent variable, i.e., a variable that can take only two values (such as yes or no, on or off). Assume that this variable, represented as a 0-1 binary variable, is modelled as a linear function of a set of explanatory variables and of an error term. The predicted values from the estimation of this model should fall mainly within the 0-1 interval, suggesting that they could be interpreted as probabilities that the dependent variable takes the value (0 or 1), given the values of the explanatory variables. However, such estimated probabilities can fall outside the 0-1 range. Various distribution functions are available to constrain the estimated probabilities to lie in the range (0, 1); the most frequently used being the cumulative standard normal probability function and the logistic function. The probit model makes use of the former, while the logit model makes use of the latter. If the qualitative dependent variable can be classified into more than two categories (i.e. if it is a polychotomous variable), estimation can be undertaken by means of the multinomial probit or the multinomial logit models, which are generalizations of the binary probit and logit models (Greene, 2002).

However, the credit rating representation of creditworthiness is not only a polychotomous qualitative variable; it is also an ordinal variable, i.e., a variable with an inherent order (unlike a polychotomous variable representing, say, choices of

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colours or travel destinations). An ordinal polychotomous dependent variable would usually be coded as 0, 1, 2, 3, and so on. This representation reflects only a ranking; it is not known to what extent going from 0 to 1 is different from (or equivalent to) going from 2 to 3. For ordinal dependent variable, using multinomial probit would not be efficient because these models would miss-specify the data gathering process in assuming that there is no order in the different categories that the dependent variable can take (Greene, 2002).

In statistics, a probit model is a type of regression where the dependent variable can only take two values, for example married or not married. A probit model is a popular specification for an ordinal or a binary response model that employs a probit link function. This model is most often estimated using standard maximum likelihood procedure; such estimation is being called a probit regression.

Suppose response variable Y is binary, that can have only two possible outcomes which we will denote as 1 and 0. For example, Y may represent presence/absence of a certain condition, success/failure of some device, answer yes/no on a survey, etc. We also have a vector of regressors X, which are assumed to influence the outcome Y. Specifically; we assume that the model takes the following form:

$$\Pr(Y = 1 \mid X) = \Phi(X'\beta),$$

Where; Pr denotes probability, and Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution. The parameters β are typically estimated by maximum likelihood.

It is also possible to motivate the probit model as a latent variable model. Suppose there is existence of an auxiliary random variable:

$$Y^* = X'\beta + \varepsilon,$$

Where; $\varepsilon \sim N(0, 1)$. Then Y can be viewed as an indicator for whether this latent variable is positive:

$$Y = \mathbf{1}_{\{Y^*>0\}} = \begin{cases} 1 & \text{if } Y^* > 0 \ \text{ i.e. } -\varepsilon < X'\beta, \\ 0 & \text{otherwise.} \end{cases}$$

This technique occurs primarily for reasons inherent in the rating setting process within the credit ratings industry (Odders-White and Ready, 2006). Several studies note that rating changes tend to exhibit serial correlation (Carty and Fons, 1994; Gonzalez *et al.*, 2004). In fact, rating agencies claim that they rate through the cycle implying that credit ratings should be stable over time. Altman and Kao (1992) documented serial autocorrelation in ratings below investment grade suggesting that a downgrade is more likely to be followed by a subsequent downgrade than by an upgrade. Finally, Pagratis and Stringa (2007) showed that bank ratings tend to be sticky and therefore persistence appears to be very important in predicting bank ratings.

One basic premise of this is that modelling credit ratings should take into account the persistent nature of ratings. Persistence in rating outcomes is observable and shows zero changes dominate in the sample and usually Fitch alters its ratings by one category (either upwards or downwards). Based on the above argument, we are

prompted to recognise the dynamic nature of ratings and therefore we opt for modeling credit ratings in a dynamic ordered probit setting. As such, the dynamic ordered probit appears as the most suitable technique to empirically evaluate the relationship between measures of business and financial risk and a probability based assessment of the rating. This model is one of the widely used approaches under the ordered response framework and it has been adopted by several social sciences. It originated from bio-statistics (Aitchison and Silvey, 1957).

The idea behind the model is a dormant continuous metric that is fundamental to the ordinal responses observed by the forecaster (Jackman, 2000). The dormant variable is a linear grouping of predictors that have normal distribution (Jackman, 2000). Besides, probit models have cumulative standard normal distribution (Torres-Reyna, 2002).

To compare, Ohlson (1980) used the new technique logistic regression that is more flexible and robust avoiding the problems of discriminant analysis. By using logistic and probit regression, a significant and robust estimation can be obtained and used by many researchers such as; Wiginton (1980), Roszbach (1998), Feelders *et al.* (1998), Hayden (2003) and Huyen and Thanh (2006).

However, according to Feng *et al.* (2008), the individual processes are independent, identically distributed across the population of the firms. The conditional distribution of the score of firm given the lagged score values depends on the past through the most recent qualitative rating. In the ordered qualitative model, the current rating depends on the last observed rating and the last factor value when the factor values

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are integrated out. The rating histories are no longer processes of order by Markov; they now cross sectionally reliant (Frey and McNeil, 2001). Each current rating is influenced by all the past ratings.

The introduction of serially correlated random factor is inspired the findings of recent times (Feng *et al.*, 2008). Bangia *et al.* (2002) stated that credit migration matrices depend on a macroeconomic variable and this was related to Nickell *et al.* (2000) who proposed a probit model with observed explanatory variables and time dependent variables based on the GDP growth of a country. Feng *et al.* (2008) argued and concluded that factors are included in the probit model so that the ratings forecast will require the use of an additional dynamic model for predicting the values of observable factors at a required number of steps ahead. This implies that no matter what types of factors are considered, the factor's dynamics has to be stated and projected.

Furthermore, according to the concluding remarks of Cheung (1996), the ordered probit framework makes it possible to capture and summarize the historical relationship between discrete-valued credit ratings and continuous-valued regressors. This is without the risk of assuming the magnitude of the discreteness which is not known and which would have to assume to be known in a linear regression. However, Cheung (1996) concluded that the model has some shortcomings for projection purposes.

4.6.3 Other Statistical Techniques

Horrigan (1966) and Orgler (1970) used multiple linear regressions but this method is not appropriate when the dependent variable is categorical. To avoid these problems, generalized linear models such as logit and probit regression as explained above were developed. For example, Hardle and Muller (2000) used a semiparametric regression model which is called generalized partially linear model and confirmed that this model is performed better than logistic regression.

However, statistical methods are not limited to the linear and logistic regressions; other researchers have also used different methods and techniques for the estimation of credit rating models. Early studies by Pinches and Mingo (1973) and Harmelink (1974) applied discriminant analysis by using accounting data to predict bond ratings.

Corresponding to the other ways for the estimation, we can note that the weights in the Weighted Average Rating Model are assumed to be a function of an issuer's leverage ratio. Metrics are charted out to an implied rating and the final rating is known as the average of all. The weighting has the following functions; each weight requires two free parameters and they are not constant but change with the leverage ratio. The weighted average model mostly treats each factor as a substitute for others (Mertz and Cantor, 2006).

Furthermore, Hayden (2003) investigated the univariate regression based on rating models driven by three different default definitions. Two of these definitions are based on the Basel II and the third one is based on traditional definition. The test

results show that there is not much prediction power to be lost if the traditional definition is used instead of the alternative two ones.

Roszbach (1998) used Tobit model with a variable censoring threshold proposed to investigate effects of survival time. Roszbach (1998) concluded that the variables with increasing odds were of decreasing expected survival time. This procedure was used by Hu *et al.* (2002), Bissoondoyal-Bheenick (2005), Bissoondoyal-Bheenick *et al.* (2005) and Depken *et al.* (2007).

A recent research by Zhang (2009) also came up with another statistical method named; Maturation Exogenous Vintage (MEV) decomposition framework. The MEV combination with the zero-trend vintage effect is referred to as the ad hoc approach. Other models related to this are as follows; Age Period Cohort (APC) model which is used in the social sciences of demography and epidemiology, Generalized Additive Model (GAM) which is applied in nonparametric statistics and used as the scatter plot smoother. In addition, the Generalized Additive Maturation and Exogenous Effects Decomposition (GAMEED) model is also used to reduce to a sequential type of the MEV model (Zhang, 2009).

With regard to the sovereign credit ratings, Cruces (2006) analysed the statistical properties of institutional investor sovereign ratings, the largest consistent series on sovereign ratings available in terms of the number of countries covered, the years for which it is available, and the uniformity of the criteria used over time in awarding ratings. He modelled a rating as an average of expected collection per period during a fixed window of time from the moment that it is issued and solved for expected

collection as a function of expected repayment capacity during each period. As suggested solution, Cruces (2006) explained how the volatility of ratings should change with the rating level and why ratings in some ranges should be expected to fall, and those in other ranges to rise, regardless of their previous movements. Two credit ratings given one year apart pertain to expected collection during periods that only partly overlap. Even if rating teams produce rational expectations forecasts, the non-overlapping periods can cause non-zero expected credit revisions. Further, a trending repayment capacity is expected to show as serial correlation of credit revisions.

Cruces (2006) main findings were that ratings effectively displayed volatility clustering and asymmetric adjustments, their revisions are serially correlated during most of the sample, and region and other characteristics capture common persistence in the ratings. He also concluded that sovereign ratings have three implications of interest to investors; a country's current credit rating is not necessarily the best forecast of its long term sovereign risk, the forecast function is different across countries at a given point in time, and this function should be reassessed from time to time.

4.7 Summary

This study will concentrate on estimating bank level and country level credit rating models for a set of MENA countries, using all three estimation methods mentioned above (linear regression, logit and probit). Specifically, this study will employ multiple linear regression technique such as OLS, besides random effects ordered probit and logit models for panel data regression to estimate country and bank credit ratings.

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These models are the most likely fit for the research data because the datasets are in a ranked, ordinal and panel format.

The object will be to consistently estimate and identify robust determinants of credit ratings incorporating, where appropriate, a set of bank level accounting/financial ratios and country-level indicators for regulatory, legal and economic environment. Although the estimation procedure is implemented in different econometric packages such as; LIMDEP by other researchers, STATA is an alternative package that will be utilised for the estimation in this study. Figure (4.3) demonstrates the implementation process to construct an empirical analysis in estimating the credit rating models for MENA countries and their commercial banks.
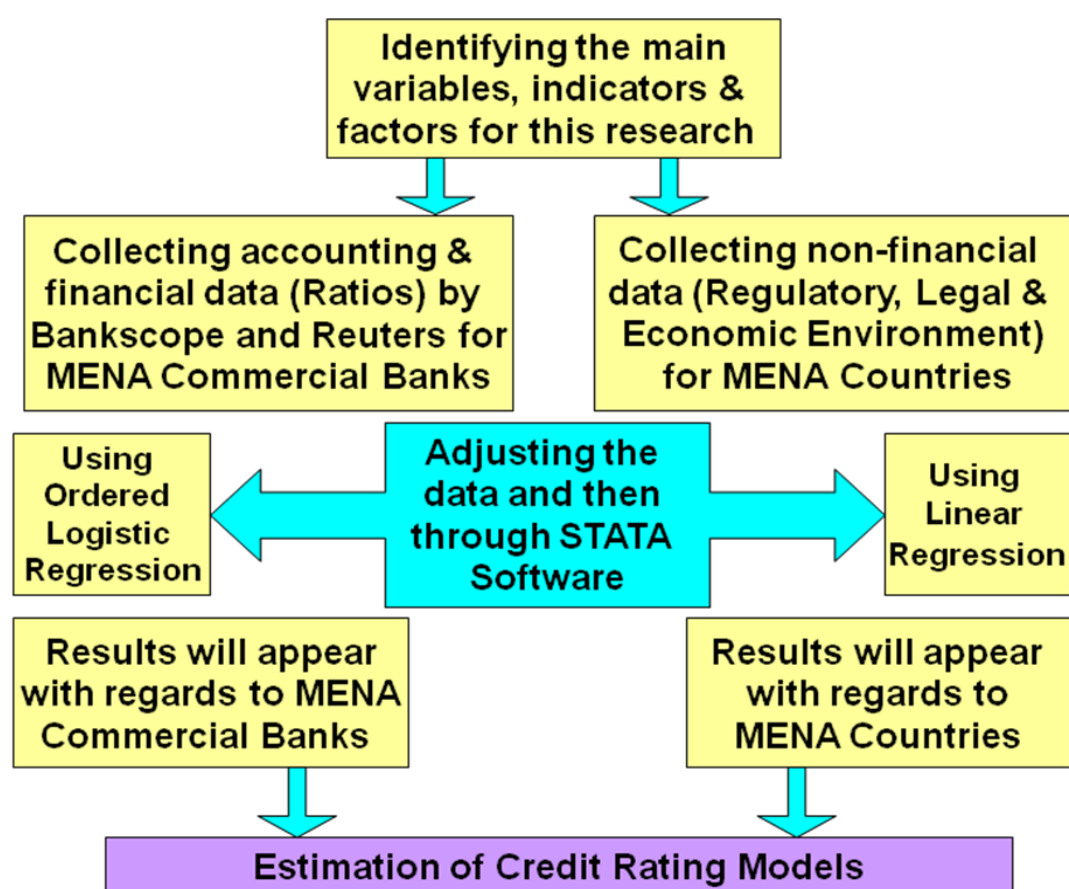
Figure (4.3): The Implementation Process for the Estimation

The above studies and data sources therein, provide the basis for constructing an appropriate panel dataset, for MENA countries and their commercial banks over the period 2000-2012 to estimate bank and country credit ratings. Banks operating under "Sharia law" in MENA region will be distinguished from others using the dummy variable approach. These panel datasets and the empirical analysis will be presented in the following chapters (5) and (6).

The PhD phase will essentially target to achieve two major objectives in this research: these are; further empirical analysis of a detailed examination of country-level data on country ratings, and investigating the impact of bank-level and country-level data on bank ratings.

To conclude, this chapter discussed the theoretical part of the econometric techniques such as; multiple linear regressions, ordered logit and probit models incorporating cointegration and causality testing procedures. In terms of statistical analysis, under positivism we can utilise any of the suggested techniques grouped by Hussy and Hooley (1995), such as the following:

- Statistical significance tests.
- Two variable linear regression, multiple regression, exponential smoothing.

The reason for selecting any of the previous techniques would be to reduce the possibility of subjectively-driven measurement criteria and to assist in the literature development, after testing research construct against validity and reliability (Remenyi *et al.*, 1998).

CHAPTER 5
COUNTRY RATING MODELS

5.1 Value of Estimating Sovereign Credit Ratings

Estimation of sovereign credit ratings has attracted the interests of academics especially in the aftermath of the recent financial crisis which resulted in the re-evaluation of the methods used to determine sovereign credit ratings. Country's sovereign credit ratings have come under a wave of criticism in the aftermath of the global financial crisis due to their reactive as opposed to a proactive nature (Kolb, 2011). In line with this wave of criticism, the aim of this section is to highlight the value of sovereign credit ratings and point out the key reasons for their continuous use.

Credit ratings represent opinions of a rating agency regarding the ability and willingness of an issuer to fulfill its financial obligations (Standardandpoor.com). In the context of country credit ratings, the issuer stands for the government and country credit rating reflects its creditworthiness. Apart from providing valuable information regarding the risk estimation, credit ratings guide investors and stakeholder's actions and as demonstrated by recent events in the European Union, country credit ratings play a crucial role in the development of economic conditions (De Santis, 2012).

Moreover, sovereign credit ratings provide the lenders with valuable information regarding the level of risk in foreign countries (Iyengaar, 2012). Furthermore, the

relationship between credit ratings and real private investment is well-documented in the study conducted by Chen *et al.* (2013) which suggests that the investors rely heavily on the sovereign credit ratings published. Overall, investors tend to underestimate the level of risk in foreign countries and therefore, the independent assessment of the credit risk encompassed in sovereign credit ratings allows them to obtain a more realistic picture. The studies conducted by Kolb (2011), Iyengaar (2012) and Cavallo, Powell and Rigobon (2013) all supported the reliability of the sovereign credit ratings and uncovered that they in fact reduce information asymmetries in the market. As a result, the sovereign credit ratings are of a substantial value for the investors.

While the estimation of credit ratings in the US and Europe has attracted a significant amount of attention (e.g. White, 2010; Shen, Huang and Hasan, 2012; Alp, 2013), the examination of credit ratings for MENA region remains largely under-researched. Recent studies focusing on the estimation of credit rating models in MENA region uncovered the substantial variability between individual countries and highlighted the influence of political (Khawaja, 2012). A recent report published by Moodys (Moodys.com, 2014) went even further and uncovered a sharp division between the oil-exporting Gulf Cooperation Council (GCC) and the remaining countries within the MENA region.

The present chapter focuses strictly on the MENA region and aims to critically examine the credit rating estimation models for these countries. The study builds on the conducted review of the existing body of research on credit ratings and thereby

combines the use of financial and non-financial variables in order to estimate a credit rating model (Afonso, Gomes and Rother, 2011; Gonis, Paul and Wilson, 2012).

The chapter itself is organised into the following four main sections, each dealing with a particular stream of research. To begin with, data description under investigation includes types and sources of the data involved, and the country's sample. The following section revolves around the estimation methods used to estimate sovereign credit ratings, presenting the empirical results and its meanings relying on numerous methodological approaches. In the next section, a discussion on the determinants of sovereign credit ratings is highlighted with reference to empirical studies and emphasis on the arguments depicted in the academic debate. The final section of this chapter is used to give a summary on the key arguments presented and re-emphasise the current understanding of the studied phenomenon by estimating country credit rating models for MENA region.

5.2 Description of the Country Estimation Sample

5.2.1 Data Sources

The data stems from five sources, including Standard and Poor's for country credit ratings, World Bank Regulation and Supervision for regulatory and supervisory variables, the International Monetary Fund for various macroeconomic variables, and the World Bank for opinions on world governance indicators. The sources are summarised in (Table 5.1) and will be clarified in the following sub-sections.

Table (5.1): Data Sources for Country's Analysis

Data	Source
Country Credit Ratings	Standard and Poor's
Regulatory and Supervisory Variables	World Bank Regulation and Supervision
Macroeconomic Variables	IMF World Economic Outlook
World Governance Indicators	World Bank

5.2.1.1 Country Credit Ratings

The study encompasses an evaluation of one dependent variable – Standard and Poor's government credit ratings. Gathering the data encompassed using Thomson Reuters' Eikon software, with each entity being assigned one of 21 possible ratings. Furthermore, in order for the letter-based ratings to be analysed, they needed to be quantified. Single letter values were assigned numerical values from AAA=21 to DDD, DD, D=1 (See Appendix 5 - A for MENA countries ratings and its transformation scales).

A summary transformation of the alphanumeric ratings to ordinal numeric rankings is given in Table (5.2). The methodology is consistent with that employed by Afonso, Gomes and Rother (2007), Boothway and Peterson (2008) and Alexe *et al. (*2003). Overall, the data set comprises of 164 data observations, with the most common ratings being A at 20, followed by BB at 19, and BBB at 17. The least common ratings are CCC+ at 1, BBB+ at 3, and AA at 5. A summary plot of how the countries' ratings have changed through time is given in Figure (5.1). Interestingly, the average country rating generally increased until 2007, and has since been on a downward trend from 2010 to 2012. Following Figure (5.2) is a geographic plot of countries' ratings. The highest rated countries in the sample are Kuwait (19), Qatar (19), and Saudi Arabia (18).

Table (5.2): S&P's Long Term Issuer for MENA Country Ratings

<u>(Symbol=Ratings)</u>

Rating	Linear Transformation	Count
AA	19	5
AA-	18	13
A+	17	12
A	16	20
A-	15	13
BBB+	14	3
BBB	13	17
BBB-	12	7
BB+	11	14
BB	10	19
BB-	9	9
B+	8	8
B	7	7
B-	6	16
CCC+	5	1
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Average Countries' Ratings by Year
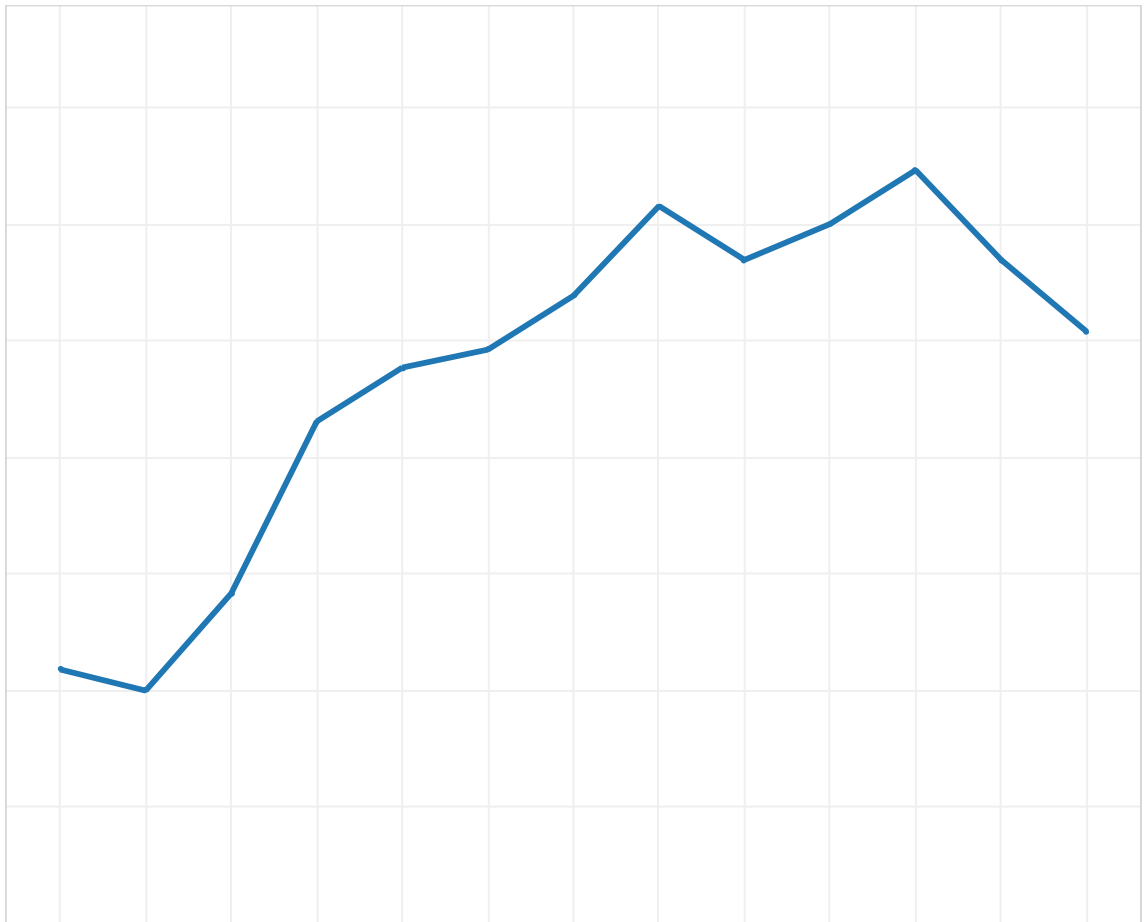
Figure (5.1): Average MENA Countries' Ratings by Year

Geographic Plot of Countries' Ratings - 2010

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Table of Country Ratings

		15	15	15	15	16	16	16	16	16	13	13
12	12	11	11	11	11	11	11	11	11	11	8	6
15	15	15	15	15	15	15	16	16	16	16	17	17
9	9	9	10	10	10	10	10	10	10	10	10	10
16	16	17	17	17	17	17	18	18	18	18	19	19
8	7	6	6	6	6	6	6	6	7	7	7	7
10	10	10	10	10	11	11	11	11	11	12	12	12
12	13	13	13	14	14	15	16	16	16	16	16	16
6	6	7	7	8	8	8	8	5	6	6	6	6
13	14	15	17	17	17	17	18	18	18	19	19	19
			16	16	16	17	18	18	18	18	18	18
13	13	13	13	13	13	13	13	13	13	13	12	10
8	6	6	8	9	9	9	9	9	9	10	10	10

Figure (5.2): Geographic Plot of MENA Countries' Ratings

5.2.1.2. Regulatory and Supervisory Variables

The dataset includes nine regulatory and supervisory variables from the World Bank's Regulation and Supervision database. The variables are based upon the work by Barth, Caprio and Levine (2001), first developed in 2000, and subsequently updated in 2003, 2007 (revised in 2008), and the last version database was updated in 2011. Because of the infrequent updates, the 2001 and 2002 data points were approximated from the 2000 database, while the 2004, 2005 and 2006 were assigned the values from the 2003 database and the 2007 values from the 2007 database. Also the 2009 and 2010 values are based on the 2008 database. Lastly, the 2012 numbers were assigned based on the 2011 database. The World Bank's methodology is based upon sometimes subjective questions regarding regulation and supervision in a given country. The non-numerical figures were converted to numerical values, following the work of Pasiouras, Gaganis and Zopounidis (2006). See Appendices 5 - B to 5 – J for the numerical transformation of these variables in relation to MENA countries.

A summary of the variable symbols used in the empirical section and the definitions are given in Table (5.3). On summary statistics, Capital Requirements have a mean of 5.33, a median of 5, and a range from 2 to 8. Deposit Insurance Scheme has a mean of 1.1, a median of 1, and a range from 0 to 6. Restrictions of Bank Activities have a mean of 2.9, a median of 3, and a range from 1 to 6. Accounting and Disclosure Requirements has a mean of 4.5, a median of 5, and a range from 2 to 7. Auditing Requirements has a mean of 6.7, a median of 7, and a range from 4 to 8. Entry into Banking Requirements

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has a mean of 7.2, and median of 8, and a range from 3 to 8. Official Disciplinary Power

of the Supervisory Agency has a mean of 10, a median of 10, and a range from 5 to 13.

Liquidation and Diversification Requirements has a mean of 2.7, a median of 2, and a

range from 0 to 6. Lastly, Internal Management and Organisation Requirements have a

mean of 1.9, a median of 2, and a range from 0 to 6.

Table (5.3): Regulatory and Supervisory Statistics Summary

Variable	Variable Symbol	Mean	St.Dev.	Median	Max	Min	Skewness	Kurtosis
Capital Requirements	R&S 1	5.33	1.58	5.00	8.00	2.00	0.15	-0.55
Deposit Insurance Scheme	R&S 2	1.07	1.48	1.00	6.00	0.00	2.50	5.47
Restrictions on Banks Activities	R&S 3	2.91	1.00	3.00	6.00	1.00	1.48	3.36
Accounting and Disclosure Requirements	R&S 4	5.30	0.90	5.00	7.00	2.00	-1.41	2.79
Auditing Requirements	R&S 5	6.74	0.91	7.00	8.00	4.00	-0.51	0.04
Entry into Banking Requirements	R&S 6	7.18	1.18	8.00	8.00	3.00	-1.69	2.59
Official Disciplinary Power of the Supervisory Agency	R&S 7	10.00	2.56	10.00	13.00	5.00	-0.30	-1.17
Liquidity and Diversification Requirements	R&S 8	2.67	1.07	2.00	6.00	0.00	1.67	3.25
Internal Management and Organisational Requirements	R&S 9	1.88	1.26	2.00	6.00	0.00	2.23	4.71

5.2.1.3 Macroeconomic Variables

Stemming from the International Monetary Fund's October 2013 World Economic Outlook database, the dataset includes nine macroeconomic variables. A summary of the variables with the associated symbol used in the throughout the remainder of the study is given in Table (5.4). Further descriptions of these variables follow Table (5.4).

Real GDP Growth (Macro1) ranges from -7 percent to 26 percent, with a mean Real GDP Growth of 5.3 and a standard deviation of 4.4. GDP in US Dollars (Macro2) ranges from $5 to $788, with a mean of $257 and a standard deviation of $259. GDP per Capita (Macro3) ranges from $5 to $104756, with a mean of $13855 and a standard deviation of $15675. Investment as a Percentage of GDP (Macro4) ranges from 5 percent to 48 percent, with a mean of 21 percent and a standard deviation of 7 percent. Savings as a Percentage of GDP (Macro5) ranges from 2 percent to 65 percent, with a mean of 37 percent and a standard deviation of 16 percent. Inflation (Macro6) ranges from -5 percent to 55 percent, with a mean of 9 percent and a standard deviation of 14 percent. Unemployment Rate (Macro7) ranges from 0.8 percent to 18.3 percent, with a mean of 8.4 percent and a standard deviation of 3.8 percent. Government Debt as a Percentage of GDP (Macro8) ranges from -54 percent to 177 percent, with a mean of 40 percent and a standard deviation of 36 percent. Lastly, Current Account Balance as a Percent of GDP (Macro9) ranges from -19 percent to 45 percent, with a mean of 5 percent and a standard deviation of 13 percent.

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Table (5.4): Macroeconomic Statistics Summary

Symbol	Macroeconomic Indicator	Mean	St.Dev.	Median	Max	Min
Macro1	Real GDP Growth	5.30	4.42	5.59	26.17	-7.08
Macro2	GDP in US $	256.65	259.23	184.54	788.30	5.00
Macro3	GDP per Capita	13854.57	15675.08	9515.06	104755.81	5.00
Macro4	Investment as % of GDP	21.46	7.43	20.77	47.63	5.00
Macro5	Savings as % of GDP	26.56	15.74	19.99	64.75	2.03
Macro6	Inflation	9.26	13.58	5.04	55.04	-4.87
Macro7	Unemployment Rate	8.43	3.74	9.50	18.30	0.78
Macro8	Government Debt as % of GDP	40.02	35.67	36.48	177.01	-53.93
Macro9	Current Account Balance as % of GDP	5.43	12.94	2.07	44.62	-19.15

Macro1: Real GDP Growth: Gross domestic product, constant prices (National currency). Annual percentages of constant price GDP are year-on-year changes; the base year is country-specific.

Macro2: GDP per U.S. dollars, Billions: Gross domestic product, current prices (National currency). Values are based upon GDP in national currency converted to U.S. dollars using market exchange rates (yearly average).

Macro3: GDP per Capita (U.S. dollars, Units): Gross domestic product, current prices (National currency) Population (Persons). GDP is expressed in current U.S. dollars per person. Data are derived by first converting GDP in national currency to U.S. dollars and then dividing it by total population.

Macro4: Total Investment as Percent of GDP: Expressed as a ratio of total investment in current local currency and GDP in current local currency.

Macro5: Gross National Savings as Percent of GDP: Expressed as a ratio of gross national savings in current local currency and GDP in current local currency.

Macro6: Inflation as Percent Change: Inflation, average consumer prices (Index). Annual percentages of average consumer prices are year-on-year changes.

Macro7: Unemployment Rate: Percent of total labour force.

Macro8: Government Net Debt as Percent of GDP: Net debt is calculated as gross debt minus financial assets corresponding to debt instruments.

Macro9: Current Account Balance as Percent of GDP: Current account is all transactions other than those in financial and capital items. The major classifications are goods and services, income and current transfers.

5.2.1.4 World Bank Governance Indicators

The World Governance Indicators figures are from the 2013 update, Aggregate Indicators of Governance from 1996 to 2012. The dataset is based upon the work of Kaufmann, Kraay and Mastruzzi (2010), includes six broad measures of governance, including Voice and Accountability (G1), Political Stability and Absence of Violence/Terrorism (G2), Government Effectiveness (G3), Regulatory Quality (G4), Rule of Law (G5), and Control of Corruption (G6). A summary of these six indicators is given in Table (5.5).

The concept behind the Worldwide Governance Indicators is to provide researchers with a database containing a large number of enterprise, citizen, and expert opinions on industrial and developing economies' governance. The dataset is based on subjective opinions. The influence of environment aggregate governance indicators, expressed in this research as "Estimate" values, range from approximately -2.5 (weak) to 2.5 (strong) governance performance. Regarding the data sample in this category, the values for year 2001 have been approximated by the year of 2000, due to the unavailability of data.

On summary statistics, the Voice and Accountability (G1) measure ranges from -1.9 to 6.0, with a mean of -0.2 and a standard deviation of 1.7. The Political Stability and Absence of Violence/Terrorism (G2) ranges from -2.1 to 6.0, with a mean of 0.1 and a standard deviation of 1.7. The Government Effectiveness (G3) ranges from -0.8 to 6.0, with a mean of 0.6 and a standard deviation of 1.4. The Regulatory Quality (G4)

measure ranges from -1.7 to 6.0, with a mean of 0.6 and a standard deviation of 1.4.

The Rule of Law (G5) ranges from -1.0 to 6.0, with a mean of 0.6 and a standard

deviation of 0.6. Lastly, the Control of Corruption (G6) measure ranges from -1.0 to 6.0,

with a mean of 0.5 and a standard deviation of 1.5.

Table (5.5): Aggregate Governance Indicators Statistics Summary

Symbol	Variable Description	Mean	St.Dev.	Median	Max	Min	Skewness	Kurtosis
G1	Voice and Accountability	-0.16	1.68	-0.43	6.00	-1.86	2.83	7.48
G2	Political Stability and Absence of Violence/Terrorism	0.07	1.68	-0.50	6.00	-2.13	2.54	6.09
G3	Government Effectiveness	0.57	1.44	0.24	6.00	-0.77	3.13	8.64
G4	Regulatory Quality	0.62	1.43	0.30	6.00	-1.73	2.99	8.31
G5	Rule of Law	0.61	1.42	0.16	6.00	-0.98	3.12	8.63
G6	Control of Corruption	0.50	1.49	0.07	6.00	-0.99	2.92	7.71

5.3 Empirical Results

The empirical results section represents the regression results, correlation between all variables, robustness tests; other empirical evidence such as ANOVA, while the other parts include the estimation models (random effects ordered probit, random effects ordered logit) and a comparison between both models. In all statistical presentations, STATA version 13 was used as the software tool.

5.3.1 County Ratings Results

This sub-section presents the empirical results on the country's ratings data. As an initial inspection, Table (5.6) contains the correlation of all the variables included in the country ratings dataset. Based solely on inspecting the country ratings variables, none of the variables merit exclusion except perhaps certain governance variables, with the correlation of these variables ranging from a low of 0.87 and most in the mid to high 90s.

Table (5.6): Correlation for MENA Country's Ratings Data

	Ratings	rs1	rs2	rs3	rs4	rs5	rs6	rs7
Ratings	1.00							
rs1	-0.23	1.00						
rs2	-0.23	0.18	1.00					
rs3	0.16	0.31	-0.23	1.00				
rs4	-0.38	0.19	-0.15	-0.19	1.00			
rs5	-0.51	0.16	0.01	-0.23	0.38	1.00		
rs6	-0.28	0.05	0.32	-0.19	-0.09	0.28	1.00	
rs7	-0.24	-0.04	0.11	-0.43	0.13	0.41	0.42	1.00
rs8	0.28	-0.39	-0.56	-0.06	-0.14	0.10	-0.22	-0.03
rs9	-0.31	0.06	-0.24	-0.37	0.57	0.65	-0.06	0.10

macro1	0.06	-0.18	0.05	-0.25	0.02	0.15	0.06	0.15
macro2	0.16	-0.08	-0.15	0.10	0.08	0.25	-0.01	0.09
macro3	0.81	0.07	-0.24	0.26	-0.10	-0.41	-0.50	-0.39
macro4	0.29	0.09	0.60	-0.03	-0.45	-0.25	0.33	0.07
macro5	0.64	-0.20	0.04	0.02	-0.53	-0.25	0.20	0.13
macro6	-0.45	-0.19	0.13	-0.01	0.16	0.29	0.05	0.00
macro7	-0.28	-0.15	0.20	-0.20	-0.23	-0.26	-0.13	-0.29
macro8	-0.40	0.07	0.00	-0.14	0.17	-0.12	-0.32	-0.27
macro9	0.54	-0.30	-0.36	0.04	-0.30	-0.13	0.01	0.09
g1voacc	0.13	0.12	0.00	0.14	0.07	-0.45	-0.70	-0.57
g2pol	0.33	-0.41	0.47	-0.23	-0.67	-0.24	0.35	-0.04
g3goveff	0.61	0.02	0.01	0.16	-0.12	-0.58	-0.66	-0.63
g4regq	0.64	0.02	0.06	0.19	-0.19	-0.52	-0.53	-0.61
g5law	0.70	-0.20	0.04	0.03	-0.35	-0.61	-0.45	-0.56
g6corr	0.64	-0.03	0.07	0.12	-0.27	-0.64	-0.54	-0.60

	rs8	rs9	macro1	Macro2	macro3	Macro4	macro5	macro6
rs8	1.00							
rs9	0.19	1.00						
macro1	0.10	0.13	1.00					
macro2	0.18	0.06	0.14	1.00				
macro3	0.14	-0.13	-0.05	0.24	1.00			
macro4	-0.31	-0.37	0.17	-0.20	0.01	1.00		
macro5	0.22	-0.32	0.16	0.06	0.33	0.49	1.00	
macro6	-0.08	0.05	-0.17	0.20	-0.24	-0.32	-0.33	1.00
macro7	-0.02	-0.05	0.01	-0.32	-0.35	0.00	-0.38	-0.12
macro8	-0.11	0.13	-0.16	-0.56	-0.24	-0.34	-0.59	0.04
macro9	0.46	-0.13	0.06	0.20	0.37	-0.12	0.81	-0.16
g1voacc	-0.19	-0.06	-0.12	-0.01	0.45	-0.19	-0.40	-0.02
g2pol	0.08	-0.38	0.22	-0.15	-0.05	0.59	0.49	-0.19
g3goveff	-0.05	-0.16	-0.07	0.01	0.81	0.04	0.03	-0.21
g4regq	-0.04	-0.18	-0.07	0.07	0.84	0.11	0.11	-0.13
g5law	0.10	-0.24	-0.02	-0.05	0.73	0.14	0.19	-0.26
g6corr	-0.04	-0.22	-0.05	-0.04	0.73	0.17	0.12	-0.32

	macro7	macro8	macro9	g1voacc	g2pol	g3goveff	g4regq	g5law
macro7	1.00							
macro8	0.64	1.00						
macro9	-0.43	-0.44	1.00					
g1voacc	0.37	0.54	-0.33	1.00				
g2pol	0.32	-0.11	0.16	-0.19	1.00			
g3goveff	0.14	0.18	0.01	0.78	0.07	1.00		

g4regq	0.05	0.07	0.06	0.68	0.16	0.94	1.00	
g5law	0.27	0.14	0.13	0.60	0.40	0.88	0.90	1.00
g6corr	0.27	0.15	0.03	0.68	0.25	0.93	0.92	0.94
	g6corr							
g6corr	1.00							

5.3.2 Ordinary Least Square Results

As an initial inspection of the data, the following Table (5.7) contains results of an Ordinary Least Square (OLS) model. The OLS results have an R-squared of 0.97 and a Root Mean Squared Error of 0.72[15]. In terms of variables with statistical significance, of the 25 predictor variables, 11 are statistically significant at the 90 percent level or higher. The statistically significant variables in the OLS framework are (symbol and coefficient in parentheses).

Deposit Insurance Scheme (rs2, -2.47), Accounting and Disclosure Requirements (rs4, 0.39), Entry into Banking Requirements (rs6, -0.24), Official Disciplinary Power of the Supervisory Agency (rs7, 0.16), GDP (macro2, 0.0001), Inflation (macro6, -0.04), Unemployment Rate (macro7, -0.23), Voice and Accountability (g1, -1.34), Government Effectiveness (g3, 2.73), Rule of Law (g5, 4.67), and the constant (6.60).

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[15] As a note, the regression reported in Table (5.6) has robust standard errors. The results with robust standard errors are reported because of prior knowledge that the data suffered from heteroskedasticity, as is shown in the following Figure (5.3).

Interestingly, of the statistically significant regulatory variables, a Deposit Insurance Scheme and Entry into Banking Requirements are negatively related, indicating perhaps countries with a higher barrier to entry into the banking system or require deposit insurance generally have lower bond ratings. In contrast, the results on Accounting and Disclosure Requirements and Official Disciplinary Power are positively related, indicating that some transparency and enforcement mechanism may lead to better run banks. The OLS results on the macroeconomic variables are unsurprising, with both Inflation and the Unemployment Rate negatively related, indicating that countries with poor economic performance are more likely to receive poor bond ratings. Additionally, the results produce a positive and statistically significant relationship between GDP size and bond rating.

On the governance results, two of the three variables are positively related with ratings – Government Effectiveness and Rule of Law. These results indicate that a government with some respect (or more likely, perception thereof) for rule of law and desire to be effective may receive a higher bond rating (presuming all other things equal).

Table (5.7): Ordinary Least Square Regression Results for Country Ratings

			F(24,	57)	=	128.51
			Prob > F		=	0.00
			R-squared		=	0.97
			Root MSE		=	0.72
			N [16]		**=**	82
		Robust				
Dependent Variable = Country Ratings	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
rs1	-0.10	0.11	-0.92	0.36	-0.31	0.11
rs2	-2.47***	0.48	-5.17	0.00	-3.42	-1.51
rs3	0.49	0.44	1.11	0.27	-0.40	1.38
rs4	0.39*	0.20	1.93	0.06	-0.01	0.80
rs5	-0.07	0.16	-0.44	0.66	-0.39	0.25
rs6	-0.24*	0.13	-1.91	0.06	-0.49	0.01
rs7	0.16**	0.08	2.01	0.05	0.00	0.32
rs8	-0.21	0.25	-0.81	0.42	-0.71	0.30
rs9	-0.44	0.32	-1.35	0.18	-1.09	0.21
macro1	-0.06	0.04	-1.62	0.11	-0.13	0.01
macro2	0.0001***	0.00	4.15	0.00	0.00	0.01
macro3	0.001	0.00	0.43	0.67	0.00	0.00
macro4	0.31	0.37	0.83	0.41	-0.43	1.04
macro5	-0.08	0.36	-0.21	0.83	-0.80	0.65
macro6	-0.04**	0.02	-2.12	0.04	-0.08	0.00
macro7	-0.23***	0.09	-2.56	0.01	-0.41	-0.05
macro8	0.01	0.01	0.75	0.46	-0.01	0.02
macro9	0.14	0.36	0.39	0.70	-0.58	0.86
g1voacc	-1.34***	0.43	-3.13	0.00	-2.20	-0.48
g2pol	0.62	0.49	1.25	0.22	-0.37	1.60
g3goveff	2.73***	0.75	3.66	0.00	1.24	4.23
g4regq	-1.06	0.94	-1.13	0.26	-2.94	0.81
g5law	4.67***	1.13	4.13	0.00	2.41	6.93
g6corr	-1.29	1.00	-1.29	0.20	-3.31	0.72
_cons	6.60*	3.73	1.77	0.08	-0.86	14.07
*Significant at the 90% level, ** significant at the 95% level, *** significant at the 99% level						

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[16] N=82 is less than the total sample size of 169 because variables with missing predictors are excluded from the calculation in STATA.

5.3.2.1 OLS Robustness Checks

This sub-section presents checks for robustness, including inspections on heteroskedasticity, autocorrelation, collinearity, and non-normality.

5.3.2.1.1 Heteroskedasticity

Reported in the following Figure (5.3) is a heteroskedasticity check on the OLS residuals. The results indicate some interesting patterns, with the residuals exhibiting diagonal patterns. The diagonal patterns are the result of trying to fit an inefficient OLS model on panel data in ordered format. The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity fails to confirm heteroskedasticity, with a chi2 (1) of 0.52 and a p of 0.47.
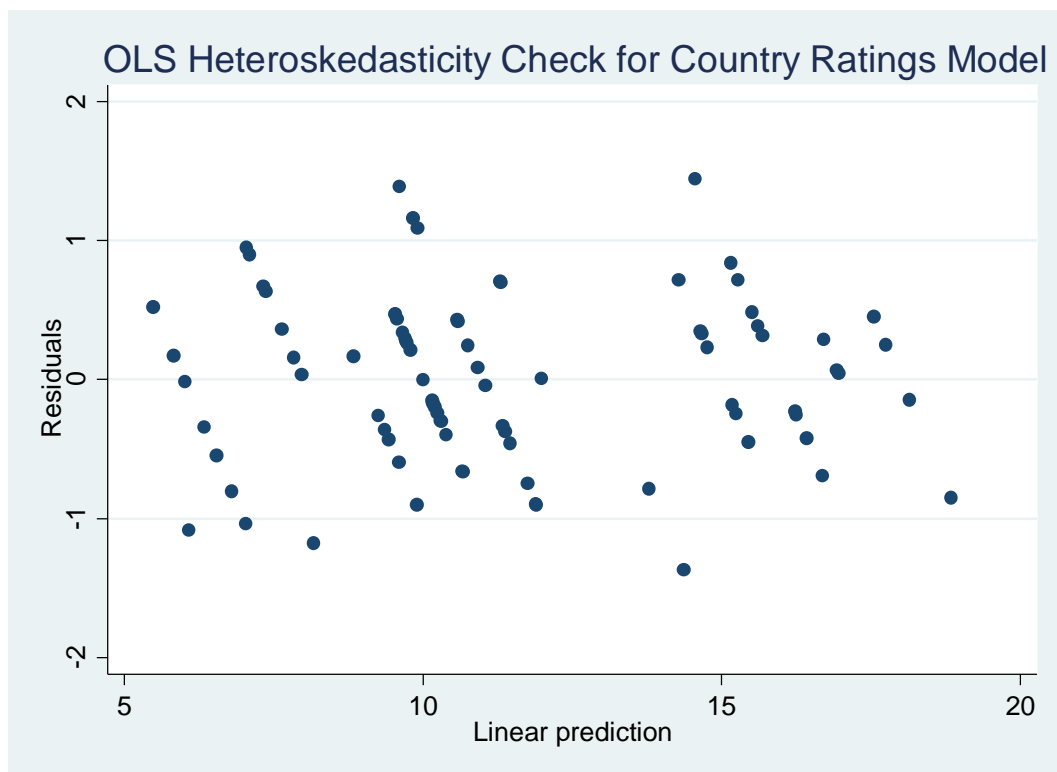
Figure (5.3): Heteroskedasticity Check on OLS Residuals for Country Ratings

5.3.2.1.2 OLS Autocorrelation

The data includes a time series component. Because of this, an IM-Pesaran-Shin unit-root test was performed on the ratings. The IM-Pesaran-Shin test produces a Z-t-tilde-bar of 2.95 and a p-value of greater than 0.99, indicating that one fails to reject the null hypothesis that all panels contain a unit root. The autocorrelation problem is addressed later in the paper through the use of random effects ordered probit model and a random effects ordered logit model.

5.3.2.1.3 OLS Collinearity

The variance inflation factor tests are reported in the following Table (5.8). Unsurprisingly given the nature of the dataset, suffer from collinieariy (VIF > 4). Although coefficients in the model are not affected by collinearity, the standard errors are. This issue is addressed in the logit and probit models.

Table (5.8): OLS Collinearity Diagnostics for Country Rtaings

Collinearity Diagnostics				
Variable	VIF	SQRT VIF	Tolerance	R-Squared
Ranking	33.93	5.82	0.03	0.97
rs1	4.97	2.23	0.20	0.80
rs2	12.77	3.57	0.08	0.92
rs3	3.45	1.86	0.29	0.71
rs4	6.11	2.47	0.16	0.84
rs5	8.44	2.90	0.12	0.88
rs6	8.50	2.92	0.12	0.88
rs7	5.64	2.37	0.18	0.82
rs8	4.29	2.07	0.23	0.77
rs9	5.72	2.39	0.17	0.83
macro1	1.56	1.25	0.64	0.36

macro2	5.46	2.34	0.18	0.82
macro3	38.02	6.17	0.03	0.97
macro4	793.68	28.17	0.00	1.00
macro5	2,124.65	46.09	0.00	1.00
macro6	5.04	2.25	0.20	0.80
macro7	11.47	3.39	0.09	0.91
macro8	10.43	3.23	0.10	0.90
macro9	1,640.72	40.51	0.00	1.00
g1voacc	14.80	3.85	0.07	0.93
g2pol	19.15	4.38	0.05	0.95
g3goveff	52.74	7.26	0.02	0.98
g4regq	42.53	6.52	0.02	0.98
g5law	57.41	7.58	0.02	0.98
g6corr	37.69	6.14	0.03	0.97
Mean VIF	197.97			

5.3.2.1.4 OLS Omitted Variables Bias

The OLS results comprise 25 independent regression variables. Still, the data may suffer from omitted variable bias. To check for this, a Ramsey RESET test using powers of the fitted values was performed. The result gave an $F_{(3, 54)}$ value of 1.81 and a p-value of 0.16, meaning one fails to reject the null hypothesis of no omitted variable bias. The result, though, may change with the use of a more efficient model used later in this paper.

5.3.2.1.5 OLS Non-Normality

The last robustness test reported here is consideration of non-normality. The following Table (5.9) reports the Skewness/Kurtosis/Shapiro-Wilk W tests for normality. The results indicate that the Ranking variable is not normally distributed in looking at the z value of 3.09 from the Shapiro-Wilk W test.

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Table (5.9): OLS Normality Test for Country Ratings

Skewness/Kurtosis					
Variable	N	Pr (Skewness)	Pr (Kurtosis)	adj chi2 (2)	Prob>chi2
Ranking	164.00	0.59	0.00	46.25	0.000
Shapiro-Wilk W test					
Ranking	164.00	0.97	3.89	3.09	0.001

5.3.3 ANOVA

This section presents results of an analysis of variance model (ANOVA). As a note, ANOVA models do not allow non-integer or negative values as factors in an ANOVA model. Because of this, the reported macroeconomic and governance variables are in rounded thousands, with the variables transformed into all positive integers by adding to each column cell the minimum of the given variable. The results are reported in Table (5.10). Overall, the ANOVA model produces an R-squared of 0.99, with a Root Mean Squared Error (MSE) of 0.47.

Of the variables with a strong relationship, all seven of the non-excluded regulatory variables are strongly related, with F values ranging from 2.97 to 13.80 and all significant at the 95% level or above.

In contrast to the regulatory results, the sole macroeconomic variable with close to statistical significance is the Unemployment Rate (macro7) at 93%. Similar to the macroeconomic variables' results, the sole governance variable with any significance of 90% is Government Effectiveness (G3) at 92%. The ANOVA results turn out to be inferior to the random effects logit/probit results, so no further discussion is needed here.

Table (5.10): ANOVA Regression Results for Country Ratings

ANOVA Results					
N=82				R-Sq=0.99	
Root MSE = 0.47				Adj- R-Sq=0.98	
Source	Partial SS	df	MS	F	Prob > F
Model	983.17	40.00	24.58	111.72	0.00
RS1	3.26**	5.00	0.65	2.97	0.02
RS2	3.04*	1.00	3.04	13.80	0.00
RS3	3.03*	1.00	3.03	13.78	0.00
RS4	3.50*	3.00	1.17	5.31	0.00
RS5	2.76**	4.00	0.69	3.13	0.02
RS6	4.24*	3.00	1.41	6.43	0.00
RS7	10.72*	8.00	1.34	6.09	0.00
RS8	0.00	0.00			
RS9	0.00	0.00			
Macro1	0.00	1.00	0.00	0.01	0.93
Macro2	0.00	1.00	0.00	0.01	0.92
Macro3	0.19	1.00	0.19	0.88	0.35
Macro4	0.00	1.00	0.00	0.01	0.91
Macro5	0.00	1.00	0.00	0.00	0.98
Macro6	0.21	1.00	0.21	0.94	0.34
Macro7	0.74***	1.00	0.74	3.36	0.07
Macro8	0.35	1.00	0.35	1.61	0.21
Macro9	0.00	1.00	0.00	0.00	0.99
G1VOACC	0.32	1.00	0.32	1.45	0.23
G2POLths	0.03	1.00	0.03	0.14	0.71
G3GOVEFFths	0.71	1.00	0.71	3.24	0.08
G4REGQths	0.03	1.00	0.03	0.14	0.71
G5LAWths	0.16	1.00	0.16	0.72	0.40
G6CORRths	0.04	1.00	0.04	0.17	0.69

Residual	9.02	41.00	0.22		
Total	992.20	81.00	12.25		
*Significant at the 99% level, ** 95% level, *** 90% level					

5.3.3.1 ANOVA Robustness Checks

This section presents checks for robustness, including inspections on heteroskedasticity, autocorrelation, collinearity, and non-normality of the ANOVA results.

5.3.3.1.1 ANOVA Heteroskedasticity

Reported in the following Figure (5.4) is a heteroskedasticity check on the ANOVA residuals. The results indicate some interesting patterns, with the residuals exhibiting diagonal patterns and getting smaller as the prediction number increases. The diagonal patterns are the result of trying to fit an inefficient OLS model on panel data in ordered format. The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity confirm heteroskedasticity, with a chi2 (1) of 25.46 and a p of less than 0.01.
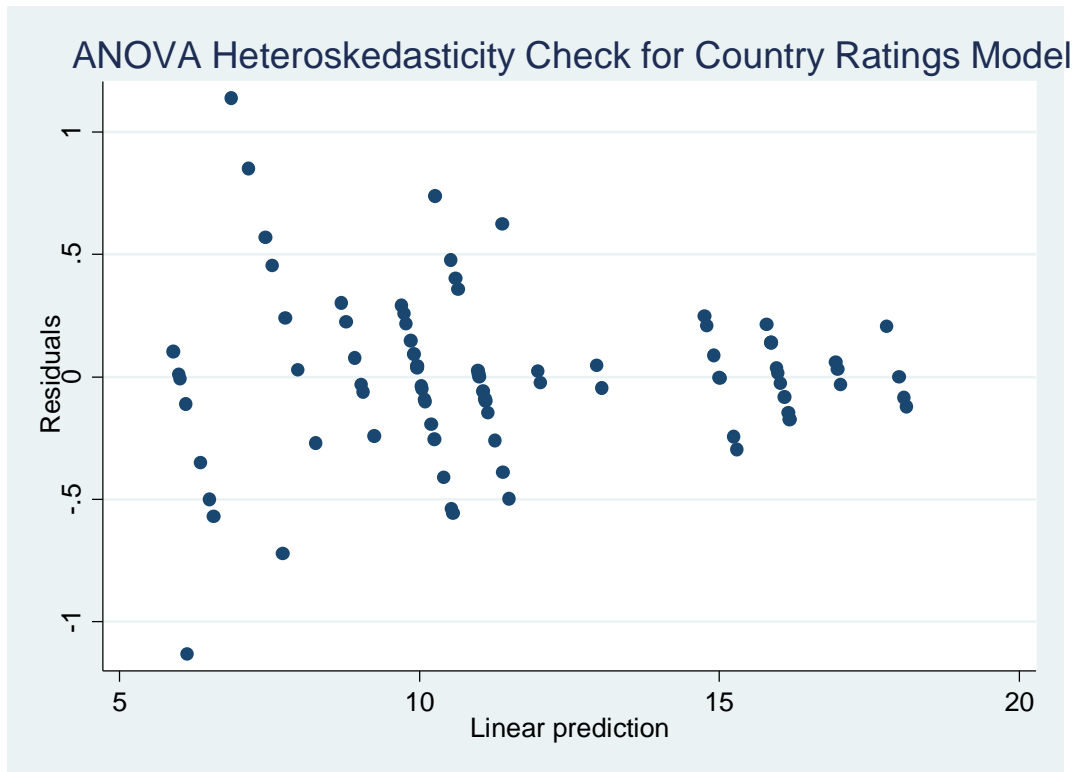
Figure (5.4): Heteroskedasticity Check on ANOVA Residuals for Country Ratings

5.3.3.1.2 ANOVA Collinearity

The variance inflation factor tests are reported in the following Table (5.11). The diagnostics for ANOVA collinearity differ little from the OLS results, indicating no further explanation is needed. The results indicate collinearity problems.

Table (5.11): ANOVA Collinearity Diagnostics for Country Ratings

Collinearity Diagnostics				
Variable	VIF	SQRT VIF	Tolerance	R-Squared
Ranking	33.77	5.81	0.03	0.97
RS1	4.99	2.23	0.20	0.80
RS2	12.77	3.57	0.08	0.92
RS3	3.44	1.86	0.29	0.71
RS4	6.13	2.48	0.16	0.84
RS5	8.45	2.91	0.12	0.88

RS6	8.49	2.91	0.12	0.88
RS7	5.64	2.37	0.18	0.82
RS8	4.30	2.07	0.23	0.77
RS9	5.73	2.39	0.17	0.83
Macro1	1.56	1.25	0.64	0.36
Macro2	5.47	2.34	0.18	0.82
Macro3	37.78	6.15	0.03	0.97
Macro4	791.87	28.14	0.00	1.00
Macro5	2,122.61	46.07	0.00	1.00
Macro6	5.04	2.25	0.20	0.80
Macro7	11.43	3.38	0.09	0.91
Macro8	10.44	3.23	0.10	0.90
Macro9	1,638.57	40.48	0.00	1.00
G1VOACC	14.83	3.85	0.07	0.93
G2POL	18.98	4.36	0.05	0.95
G3GOVEFF	52.59	7.25	0.02	0.98
G4REGQ	42.33	6.51	0.02	0.98
G5LAW	56.54	7.52	0.02	0.98
G6CORR	37.55	6.13	0.03	0.97
Mean VIF	197.65			

5.3.3.1.3 ANOVA Omitted Variable Bias

The ANOVA results for omitted variable bias indicate a Ramsey RESET F (3, 38) value of 15.59 and a p-value of less than 0.01, meaning one rejects the null hypothesis of no omitted variable bias.

5.3.4 Random Effects Ordered Probit

With the results of the OLS and ANOVA models providing some interesting, albeit biased results, this section presents the random effects ordered probit model results. A random effect ordered probit model is the most likely fit for the data because the data are in a ranked, ordinal, and panel format. A

random effect ordered probit model simply fits the following model given in Equation (1):

$$y^Y = x'\beta + \epsilon \qquad (1)$$

Where: y^Y represents the rank-ordered dependent variable (in this case country rating), x' represents the column vectors of the predictor variables, β is a vector of estimated coefficients, and ϵ is the error term. A probit distribution is then fitted to the model, which is given in the following Equation (2):

$$Probit\ Distribtuion = \sqrt{2}erf^{-1}(2p-1) \qquad (2)$$

The following Table (5.12) presents the results of a random effects ordered probit model for country ranking. As a note, the results reported below exclude macro6 (Inflation) and macro7 (Unemployment Rate) due to the amount of observations excluded when including these two variables (N drops from 142 to 82 because of missing values). As is shown in Table (5.12), there are ten independent variables of statistical significance in the probit model.

The results on the regulatory variables (rs1 and rs9) indicate that too much regulation is a bad thing when it comes to bond ratings, with every one unit increase in Capital Requirements correlated with a 0.29 drop in expected bond rating. The drop is larger for Internal Management and Organisational Requirements at a 0.69 drop.

The results on the macroeconomic variables are also surprising. A one unit increase in real GDP growth is correlated with a 0.08 drop in expected bond rating. The other three statistically significant macroeconomic results are more in-line with a priori theory. Real GDP has a 1% positive association, GDP per capita is slightly positive, and investment is at 0.48, the largest positive effect of the macroeconomic variables.

The last group – governance – has three of its four statistically significant variables in positive correlation territory, with Political Stability at 1.75, Government Effectiveness at 6.52, and Rule of Law at 3.08. In contrast to the previous three, Control of Corruption is negatively correlated at -3.20.

Table (5.12): Random Effects Ordered Probit Results for Country Ratings

N = 142				LR ratio chi2 = 201.35	
N groups = 13				Log likelihood = -138.99	
Rankings	dy/dx	Std. Err.	z	P>z	[95% Conf. Interval]
rs1	-0.29**	0.15	-1.96	0.05	-0.58	0.00
rs2	-1.10	0.96	-1.14	0.25	-2.98	0.79
rs3	-0.69***	0.38	-1.80	0.07	-1.44	0.06
rs4	-0.08	0.23	-0.34	0.74	-0.53	0.37
rs5	-0.10	0.28	-0.35	0.73	-0.64	0.45
rs6	0.01	0.19	0.07	0.94	-0.36	0.38
rs7	0.05	0.09	0.58	0.57	-0.12	0.22
rs8	0.40	0.38	1.05	0.30	-0.35	1.15
rs9	-0.77	0.51	-1.50	0.13	-1.77	0.23
macro1	-0.08**	0.05	-1.82	0.07	-0.17	0.01
macro2	0.01*	0.00	2.45	0.01	0.00	0.01
macro3	0.0002*	0.00	4.10	0.00	0.00	0.00
macro4	0.48**	0.21	2.26	0.02	0.06	0.90
macro5	-0.23	0.21	-1.08	0.28	-0.64	0.19

macro6	-0.03	0.03	-1.02	0.31	-0.09	0.03
macro9	0.21	0.22	0.98	0.33	-0.21	0.63
g1voacc	-1.32	0.89	-1.49	0.14	-3.07	0.42
g2pol	1.75*	0.55	3.16	0.00	0.66	2.84
g3goveff	6.52*	1.64	3.97	0.00	3.30	9.73
g4regq	-0.75	1.17	-0.65	0.52	-3.04	1.53
g5law	3.08***	1.70	1.81	0.07	-0.25	6.40
g6corr	-3.20*	1.07	-2.98	0.00	-5.30	-1.10
/cut1	-9.43	3.73	-2.53	0.01	-16.74	-2.13
/cut2	-6.10	3.66	-1.67	0.10	-13.27	1.08
/cut3	-5.16	3.67	-1.41	0.16	-12.35	2.02
/cut4	-3.34	3.61	-0.92	0.36	-10.42	3.74
/cut5	-1.71	3.60	-0.48	0.63	-8.77	5.34
/cut6	0.95	3.62	0.26	0.79	-6.14	8.03
/cut7	2.79	3.62	0.77	0.44	-4.30	9.88
/cut8	4.63	3.61	1.28	0.20	-2.44	11.70
/cut9	8.38**	3.76	2.23	0.03	1.01	15.74
/cut10	8.86**	3.76	2.36	0.02	1.50	16.22
/cut11	10.77*	3.74	2.88	0.00	3.44	18.10
/cut12	14.63*	3.94	3.71	0.00	6.91	22.35
/cut13	19.86*	4.28	4.64	0.00	11.47	28.26
/cut14	25.09*	5.11	4.91	0.00	15.09	35.10
/sigma2_u	26.00	12.92			9.82	68.84
LR test vs. oprobit regression: chibar2(01) = 100.52 Prob>=chibar2 = 0.0000						
*99% level, **95% level, ***90% level						

5.3.5 Random Effects Ordered Logit

Comparable to the presentation in Equation (1), an ordered logit fits the data
of interest using the following distribution function:

$$Logit\ Distribtuion = \frac{1}{1+e^{-x}} \tag{3}$$

The following Table (5.13) presents the results of random effects ordered logit
model for country ranking. As mentioned in the probit section, the results

reported below exclude macro6 (Inflation) and macro7 (Unemployment Rate) due to the amount of observations excluded when including these two variables (N drops from 142 to 82 because of missing values). Similar to the probit results, ten of the independent predictors are statistically significant in the logit framework. The statistically significant variables include:

- Capital Requirements (rs1) with an odds-ratio at 0.66 (90% level);

- Internal Management and Organisational Requirements (rs9) with an odds-ratio of 0.19 (90% level);

- Real GDP Growth (macro1) with an odds-ratio of 0.86 (90% level);

- GDP (macro2) with an odds ratio of 1.01 (95% level);

- GDP per capita (macro3) with an odds-ratio of 1.00 (99% level);

- Investment as a percentage of GDP (macro4) with an odds-ratio of 2.41 (95% level);

- Voice and Accountability (g1) with an odds-ratio of 0.07 (90% level);

- Political Stability and Absence of Violence/Terrorism (g2) with an odds-ratio of 18.71 (99% level);

- Government Effectiveness (g3) with an odds-ratio of 89,442 (99% confidence level);

- Rule of Law (g5) with an odds-ratio of 203.52 (99% confidence level); and,

- Control of Corruption (g6) with an odds-ratio of 0.005 (99% confidence level).

The results are somewhat surprising in relation to theory. First, only two of the nine regulatory variables are statistically significant, and the two that exhibit significance have odds-ratios less than one. The result on Capital Requirements at 0.66 indicate that countries with less stringent capital requirements are by a 1.5 to 1 margin more likely to get a better credit rating. Also surprising, the result on Internal Management and Organisational Requirements at 0.19 indicates that countries with less burdensome organisational requirements are by 5 to 1 odds more likely to receive a better bond rating.

The second area is the macroeconomic variables, with four of the variables statistically significant and three of the four greater than one. The sole variable with an odds-ratio less than one is Real GDP Growth (macro1) at 0.86, indicating that countries with slower GDP growth have 1.16 to 1 higher odds to receive a better bond rating. In contrast, higher absolute GDP countries are 1% more likely to be assigned a higher rating, countries with higher GDP per capita are only slightly more likely to be given a higher bond rating, while countries with large investment activity as a percentage of GDP are by a greater than 2 to 1 margin to be given a higher bond rating.

The last grouping is the governance variables. The two governance variables with an odd-ratio less than one are Voice and Accountability at 0.07 and Control of Corruption at 0.005, indicating that countries with less burdensome corruption activities are more likely to be assigned a higher rating. On the other end, Political Stability and Government Effectiveness each have very

large probabilities associated with their effect on bond ratings. Given the size
of these two results, the reader is cautioned into reading too much into the
magnitude of the effect, but rather focuses on the direction.

Table (5.13): Random Effects Ordered Logit Results for Country Ratings

N = 142				LR ratio chi2 = 194.1	
N groups = 13				Log likelihood = -139.2	
Rakings	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]
rs1	0.66	0.18	-1.55	0.12	0.38	1.12
rs2	0.09	0.16	-1.36	0.18	0.00	2.87
rs3	0.25***	0.18	-1.92	0.06	0.06	1.03
rs4	1.00	0.41	-0.01	0.99	0.44	2.25
rs5	0.95	0.47	-0.11	0.91	0.36	2.50
rs6	0.96	0.31	-0.13	0.89	0.50	1.82
rs7	1.09	0.17	0.55	0.59	0.80	1.47
rs8	1.68	1.16	0.75	0.46	0.43	6.52
rs9	0.19***	0.18	-1.79	0.07	0.03	1.17
macro1	0.86***	0.07	-1.89	0.06	0.74	1.01
macro2	1.01**	0.01	2.23	0.03	1.00	1.02
macro3	1.00*	0.00	3.83	0.00	1.00	1.00
macro4	2.41**	0.90	2.36	0.02	1.16	4.99
macro5	0.66	0.24	-1.14	0.25	0.32	1.34
macro6	0.94	0.05	-1.14	0.25	0.84	1.05
macro9	1.49	0.55	1.08	0.28	0.72	3.08
g1voacc	0.07***	0.11	-1.68	0.09	0.00	1.57
g2pol	18.71*	18.81	2.91	0.00	2.61	134.20
g3goveff	89,441.75*	257,785	3.96	0.00	314.95	25,400,000
g4regq	0.27	0.55	-0.64	0.52	0.01	14.35
g5law	203.52***	637.09	1.70	0.09	0.44	94,000.89
g6corr	0.005*	0.01	-2.67	0.01	0.00	0.24
/cut1	-16.81	6.61	-2.54	0.01	-29.77	-3.85
/cut2	-10.77	6.51	-1.65	0.10	-23.54	2.00
/cut3	-9.11	6.51	-1.40	0.16	-21.87	3.65
/cut4	-5.84	6.42	-0.91	0.36	-18.42	6.74
/cut5	-2.94	6.40	-0.46	0.65	-15.48	9.59
/cut6	1.75	6.44	0.27	0.79	-10.87	14.37
/cut7	4.95	6.46	0.77	0.44	-7.72	17.62
/cut8	8.25	6.45	1.28	0.20	-4.40	20.90

/cut9	14.98	6.78	2.21	0.03	1.69	28.28
/cut10	15.92	6.78	2.35	0.02	2.63	29.20
/cut11	19.55	6.75	2.90	0.00	6.32	32.78
/cut12	26.27	7.11	3.69	0.00	12.33	40.22
/cut13	35.41	7.79	4.54	0.00	20.14	50.67
/cut14	44.54	9.34	4.77	0.00	26.24	62.85
/sigma2_u	79.95	40.13			29.89	213.85
LR test vs. ologit regression: chibar2(01) = 102.69 Prob>=chibar2 = 0.0000						
*99% confidence level, **95% confidence level, ***90% confidence level						

5.3.6 Hausman Model Discussion

In panel modelling, the most often used statistic in evaluating whether a random effects or fixed effects model fits the data best is the Hausman statistic (Hausman, 1978). In evaluating consistency of estimators that are generally efficient, the Hausman statistic has as the null hypothesis that random effects is preferred due to higher efficiency.

In the current study, the results of the Hausman statistic is not reported because of the probit and logit order model structures. The dependent variable is a binary outcome variable with independent fixed effects, which eliminates a fixed effects model from consideration in most binary panel model regressions. Additionally, STATA, the software employed in this study, specifically recommends avoiding attempts at a fixed effects panel regression unless there are a large number of observations within each group (STATA Corporation, 2003). In the current study, the number of observations within each group is at most 13, which means that the number of estimated parameters increases to infinity (theoretically), which makes the estimates inconsistent (Greene, 2003).

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In addition to the issues with attempting a fixed effects model on ordered logit and probit regression models, the results of the random effects model appears to fit the data well, as shown in the post-estimation results on the Likelihood Ratio tests for the ordered probit and logit regressions presented previously in this chapter.

As shown in Table (5.14), both country's models indicate a Prob > chi2 (or Prob > chibar2 for probit models) of less than 0.01, indicating, at the very least, that the ordered probit and logit models reported provide more information than simply guessing the outcome of a given rating.

Table (5.14): Fit Results for the Country's Ordered Logit/Probit Models

Country Ratings Model (probit)	LR test vs. ordered probit regression: chi2(0) = 8.5e-14, Prob> chi2 < 0.01.
Country Ratings Model (logit)	LR test vs. ordered logit regression: chi2(0) = 8.5e-14, Prob> chi2 < 0.01.

5.3.7 Comparison between Ordered Probit and Logit

Among the methods available to compare probit model results to logit model results are the AIC and BIC figures. The following Table (5.15) provides such a comparison. As is shown, the two models produce virtually identical results. Because of this, both models' results are discussed in the next section regarding connecting the results with the theory.

Table (5.15): AIC and BIC of Probit vs. Logit Models for Country Ratings

Probit Model AIC and BIC					
Obs	ll(null)	ll(model)	df	AIC	BIC
142	-239.67	-138.99	37.00	351.98	461.35
Logit Model AIC and BIC					
Obs	ll(null)	ll(model)	df	AIC	BIC
142	-236.31	-139.25	37.00	352.49	461.86

5.4 Critical Discussions of the Empirical Results

With the empirics now established, this section discusses the results in relationship to a priori theory. The following Table (5.16) contains the results from the probit and logit models.

Table (5.16): Random Effects Ordered Probit vs. Logit Results for Country Ratings

N = 142				
N groups = 13				
	Probit		Logit	
Ranking	dy/dx	P>z	Odds-Ratio	P>z
rs1	-0.29**	0.05	0.66	0.12
rs2	-1.10	0.25	0.09	0.18
rs3	-0.69*	0.07	0.25*	0.06
rs4	-0.08	0.74	1.00	0.99
rs5	-0.10	0.73	0.95	0.91
rs6	0.01	0.94	0.96	0.89
rs7	0.05	0.57	1.09	0.59
rs8	0.40	0.30	1.68	0.46
rs9	-0.77	0.13	0.19*	0.07
macro1	-0.08*	0.07	0.86*	0.06
macro2	0.01***	0.01	1.01**	0.03
macro3	0.0002***	0.00	1.00***	0.00
macro4	0.48**	0.02	2.41**	0.02
macro5	-0.23	0.28	0.66	0.25

macro6	-0.03	0.31	0.94	0.25
macro9	0.21	0.33	1.49	0.28
g1voacc	-1.32	0.14	0.07*	0.09
g2pol	1.75***	0.00	18.71***	0.00
g3goveff	6.52***	0.00	89,441.75***	0.00
g4regq	-0.75	0.52	0.27	0.52
g5law	3.08**	0.07	203.52*	0.09
g6corr	-3.20***	0.00	0.005***	0.01
*90% level, **95% level, ***99% level				

The first variable is Capital Requirements (rs1). This variable has a marginal effect on the logit model; Capital Requirements has an odds-ratio of 0.66 and a statistical significance at the 88% level. The 0.66 implies about a 1.5 to 1 higher likelihood for countries with less of a capital requirement burden to have a higher bond rating, compared to 0.29 for the probit result. Although the two differ by a reasonable amount, the two are consistent in direction. This result is given the popular view that capital requirements act as a backstop when the financial system is under stress. The finding, though, may be the result of the effect higher capital requirements have on overall economic growth. Essentially, if countries impose higher capital requirements, this may result in lower overall GDP and similar measures, which might put downward pressure on bond ratings. These findings are consistent with the results of previous studies such as; Pasiouras and Zopounidis (2010) and Pasiouras *et al.* (2006).

The next statistically significant regulatory variable is Restrictions on Bank Activities. The variable has a marginal effect coefficient of -0.69 and an odds-ratio of 0.25 (4 to 1). Both are statistically significant at the 90% level. The results show that restrictions on banking activity may lead to lower bond

ratings. Similar to the capital requirements finding, this may be the result of the effect these restrictions have on economic risk taking and its effect on broader economic growth.

The last of the regulatory variables to exhibit any measure of statistical significance is Internal Management and Organisational Requirements (rs9). The probit marginal effect for this measure is -0.77, while the logit odds-ratio is 0.19 (5 to 1 odds). Overall, the results imply that country level regulation on Internal Management and Organisational Requirements is not beneficial for bond ratings.

The remainder of the regulatory variables is statistically insignificant in both the probit and logit regressions. Interestingly, none of the regulatory variables have any statistical significance at improving a country's bond rating, while three show the negative effects of regulation on bond ratings.

The next grouping is the macroeconomic variables. The first statistically significant variable is Real GDP growth (macro1). This variable does not show a positive relationship, with the marginal effect from the probit regression at -0.08 and the odds-ratio at 0.86 (1.16 to 1 odds). Both probit and logit results are statistically significant. The statistical significance indicates that as Real GDP growth increases relative to other countries, bond ratings generally decrease. The counterintuitive findings might be the result of small country sample size or, a more likely explanation lies in the nature of how growth happens. Here is what the previous statement means. Countries that grow

faster generally are emerging economies with smaller banking sectors. The lack of a strong financial system may lead bond rating agencies to lower a given countries' bond rating even though these countries may be growing much quicker than countries with larger financial systems.

The remaining three statistically significant macroeconomic variables are in the expected shape. The next variable is GDP (macro2). Overall, the probit model gives a coefficient of 0.01, while the logit model gives an odds-ratio of 1.01. Both models confirm the idea that nations with higher total GDP generally get higher bond ratings. The effect, though, is not that large compared to the previous variables' results. This finding likely corresponds to the explanation given in for the Real GDP growth finding.

Following GDP is GDP per capita (macro3), with a probit marginal effect of 0.0002 a logit coefficient of slightly greater than one. This variable also exhibits a small positive effect, although, the small positive effect is very small.

The final macroeconomic variable with a measure of statistical significance is Investment as a percentage of GDP (macro4), with a probit model marginal effect of 0.48 and a logit odds ratio of 2.41. Both results are statistically significant at the 98% level. The strong relationship between Investment and the bond rating a country receives may indicate that bond rating agencies look at the long-term outlook of the economy in a given country. One of the most accurate predictors of future economic prosperity is how much a given

individual, business, or country spends on investment. This finding is given the amount of evidence produced in the economic growth literature on the importance of investment. The findings of this research in relation to the real GDP growth, total GDP, GDP per capita and investment as a percentage of GDP are consistent with the conclusion of many researchers who have focused on studying the determinants of sovereign credit ratings (see for example, Cantor and Parker, 1996; Afonso, 2003; Canuto, Santos and Porto, 2004; Rowland, 2004; Bissoondoyal-Bheenick, 2005; Mellios and Paget-Blanc 2006).

As mentioned, the remaining macroeconomic variables – Savings as a percentage of GDP (macro5), Government Debt as a percentage of GDP (macro6), and Current Account Balance (macro9) as a percentage of GDP are statistically insignificant. Two of the measures – Inflation (macro7) and the Unemployment Rate (macro8) – were dropped due to collinearity problems. The finding on Savings and Current Account Balance is unsurprising given the nature of how the financial world actually operates and how international transactions happen. By contrast, the finding that Government Debt as a percentage of GDP does not lead to lower bond ratings may give researchers some pause to think. One often hears bond rating agencies mentioned the improvement or deterioration of balance sheets as a measure in arriving at a given company's or country's bond rating. Perhaps this finding indicates that bond rating agencies do not necessarily frown upon government debt, but rather what governments are doing with their debt.

Moving on to the last group of predictor variables – governance, overall, four of the six governance variables are statistically significant. The first significant variable is Political Stability and Absence of Violence/Terrorism (g2). The probit marginal effect coefficient is 1.75 and the logit odds-ratio is 18.71. Both models produce a statistical significance of greater than 99%. This finding is unsurprising. Countries with concerns for stability or terrorism usually need to pay a risk premium to investors in order to sell their debt. Although the direction of the effect is completely unsurprising, the magnitude of the effect is perhaps somewhat surprising. The 1.75 for the probit model indicates that rating agencies, ceterus paribus, give countries a full two notch increase in their rating when political instability/terrorism is absent. The logit model convert to an almost 1,800% higher likelihood of a better bond rating when political instability/terrorism is absent.

The second significant variable is Government Effectiveness (g3), with a marginal effects coefficient from the probit model at 6.52 and a logit model estimated odds ratio of 89,422. Although the logit model coefficient should be taken with large caution, both models produce very large estimates of the positive effect Government Effectiveness has on a given country's rating. This finding is completely unsurprising given that investors purchasing a given government's debt want to know what they'll be paid back, and bond rating agencies' understanding of investors' concerns shows up in the numbers.

The third significant governance variable is Rule of Law (g5), with a marginal effects coefficient form the probit model of 3.08 and an odds ratio coefficient

from the logit model of 204. The probit model result is significant at the 93% level, while the logit model produces a 91% significance level. Akin to the discussion on the previous two findings, this variable is consistent with the concern of investors purchasing the debt and rating agencies rating the debt that governments will make good on their commitments. One sign of a given government's commitment to paying off its debt is by creating (or actually abiding by) the perception of a respect for the rule of law. Governments that do this well are rewarded; governments that do not, are punished.

The fourth and last governance variable with statistical significance is Control of Corruption (g6). Produced from the probit model, the variable has a marginal effect of -3.20, while the logit model produces an odds ratio of about 0.005. Both models produce a statistical significance level of greater than 99%.

The outcomes with regard to the political stability and absence of violence/terrorism, government effectiveness, rule of law and control of corruption are sensible, consistent and in line with the previous studies conducted by Cantor and Packer (1996), Butler and Fauver (2006), Afonso *et al.* (2007) and Bootheway and Peterson (2008).

To conclude, why would Political Stability/Absence of Terrorism, Government Effectiveness, and Rule of Law produce very strong effects on higher bond ratings and Control of Corruption produce such a strong negative effect on bond ratings? One possible explanation is that countries with an absence of

political stability/terrorism and respect for the rule of law may achieve such a result by using under-the-table corruption. Essentially, employing a quid-pro-quo strategy is to keep conditions manageable. Another possible explanation is that corruption is an efficient way to get things accomplished, and when governments attempt to control corruption, it leads to political instability. This explanation would coincide with the finding on Government Effectiveness.

5.5 Summary

An extensive body of empirical studies has been dedicated to the examination of the determinants of sovereign credit ratings in order to enhance the understanding of the studied phenomenon. A systematic study conducted by Chen, Cheng and Yang (2011) which evaluated sovereign credit ratings for 120 countries in a longitudinal period (1986-2009) revealed that particular determinants can have both positive and negative effects on the sovereign credit ratings.

The existing body of research on the estimation of credit ratings for countries highlighted numerous short- and long-term determinants of ratings. Cantor and Packer (1996) conducted the first systematic study examining the determinants of sovereign credit ratings. Cantor and Packer (1996) concluded that these economic factors explain 90 per cent of the cross-sectional variation in ratings. A more recent study conducted by Canuto, Santos and Porto (2004) extended this list and suggested that per capita income, economic growth, inflation, external debt / current account receipts ratio and government gross debt / total fiscal receipts ration are the main determinants.

The study conducted by Afonso, Gomes and Rother (2011) emphasised changes in GDP per capita, GDP growth, government debt, government balance, government effectiveness, external debt and foreign reserves as the key determinants of credit ratings.

However, the integrity of sovereign credit ratings has been questioned in the aftermath of the recent global financial crisis. The key problem arises from the argument that rating agencies are too slow in their reaction to the market trends which exacerbates the financial crises (Bissoondoyal-Bheenick and Treepongkaruna, 2011). Eijffinger (2012) went even further and argued that the business model pursued by credit rating agencies is flawed. In addition, Eijffinger (2012) pointed out the lack of competition which results in the strong market position of the top three credit rating agencies. The recommendations proposed by the author revolve around increasing the level of competition and transparency in order to enhance the quality of ratings provided. Moreover, Eijffinger (2012) suggested that investors and policy makers should not overly rely on the credit rating agencies. The practical solutions proposed by the author revolve around three potential courses of action - creation of a network of small credit rating agencies, delegation of sovereign debt ratings to the European Central Bank or the creation of a European rating agency.

The review conducted of the existing body of research on the topic of sovereign credit ratings has uncovered the crucial importance of country's credit ratings as well as the practical difficulties in their effective estimation. While the empirical body of research has focused on the examination of the

particular determinants of the credit ratings, the underlying problems stemming from the reactive nature of the credit ratings have provided the basis for the critique of the current business model.

This chapter has covered regulatory policy, macroeconomic variables, and governance factors in explaining bond rating agencies' decision to rate a given country. Some omitted variables that may also provide further insight include the power of the given country's military and influence on international events. Essentially, although the use of military power to extract payback for unpaid debt has gone out of style, strength still matters, and it likely matters by a significant amount.

CHAPTER 6
BANKS RATING MODELS

6.1 Rationale to Estimate Banks Ratings

Bank ratings reflect the bank's viability, performance and risk exposure and thereby provide valuable information for investors (Doumpos and Zopounidis, 2010). The most common estimation models rely on a combination of both financial and qualitative data in order to produce an overall performance index. Doumpos and Zopounidis (2010) highlighted the crucial role of banks ratings, especially in the aftermath of the recent financial crisis, arguing that it provides a necessary assessment of the bank's overall viability.

Despite the widely acknowledged significance of estimating bank ratings, Hau, Langfield and Marques-Ibanez (2012) uncovered a substantial level of confusion in terms of the meaning of a credit rating. As stated in the Moody's rating methodology, "*one of Moody's goals is to achieve stable expected default rates across rating categories*" (Hau, Langfield and Marques-Ibanez, 2012). Similar suggestions can be found in the methodologies of other major credit agencies, all of which point out towards the aim of developing cardinal measures of future defaults. In essence, this approach would require the agencies to accurately predict bank distress and thereby proactively shape the nature of the banking industry (Hau, Langfield and Marques-Ibanez, 2012). On the contrary to the cardinal rating for banks, ordinal ratings which

are in fact issued by the rating agencies focus solely on the assessment of the banks' relative creditworthiness.

Although the banks ratings provide valuable information regarding the relative creditworthiness of the institutions, the study conducted by Harvey and Merkowsky (2008) suggested that investors tend to rely too heavily on these ratings. As a result, the rationale to estimate bank rating models needs to be put into the wider context. On one hand, the credit ratings allow investors to gain information about the relative creditworthiness of the banking institutions and thereby contribute to the objective assessment of the bank's overall viability. On the other hand however, the limitations of the credit rating models and their ordinal nature need to be acknowledged in order to prevent over-reliance on the information encompassed in bank ratings. Furthermore, the question of bank rating quality plays a crucial role in affecting the importance of the bank's rating.

Table (6.1) below summarises the rating methodologies for banks pursued by the three major rating agencies - Fitch, Moody's and Standard & Poor's.

Table (6.1): Rating Methodologies for Banks (Adapted from Packer and Tarashev, 2011, p. 45)

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Treacy and Carey (2000) argued that internal credit rating systems provide the necessary information for the assessment of banks' viability, however, more recent studies have emphasised the need for independent banks' credit

rating models (e.g. Peresetsky and Kaminsky, 2011; Shen, Huang and Hasan, 2012; Hau, Langfield and Marques-Ibanez, 2013). In their study of rating errors, Kashyap and Kovrijnykh (2013) focused on the validity of banks' credit ratings and concluded that it largely depends on the party that requests a credit rating. While credit ratings requested by the investors provide more accurate information, these requests come often efficiently according to Kashyap and Kovrijnukh (2013).

The study conducted by Hau, Langfield and Marques-Ibanez (2013) examined the banks' credit ratings issued by the three largest rating agencies. Although these ratings are generally interpreted as the assessments of creditworthiness of an institution, significant competitive distortions affect the reliability of the ratings. The authors revealed that large banks tend to receive more positive ratings and this effect is even magnified in the case when the agency is provided with securitization business at the bank. As a result, these competitive distortions fuel the too-big-to-fail notion in the banking industry.

In addition to the existing body of research on banks' credit ratings, Shen, Huang and Hasan (2012) proposed an information asymmetry hypothesis suggesting that it can provide an explanation why banks' credit ratings vary among different countries despite those constant bank financial ratios. In their study of 86 countries covering the period from 2002 to 2008, the authors concluded that a reduction of information asymmetry represents a viable strategy of improving banks' credit ratings.

Against this background, this chapter conducts an empirical investigation of credit rating models for the MENA countries commercial banks, providing an analysis of the bank level credit rating model estimated using OLS, probit and logit methods, assessing the relative importance of the explanatory factors, and providing a critical discussion of their importance in the light of the literature.

6.2 Banks Data Sample and Sources

This section describes the data sources and presents descriptive statistics of the different variables to estimate MENA bank's ratings. The data involved in this chapter is classified according to the attributes that are measured in the dataset. It includes the dependent variable as Fitch for banks' credit ratings; and also four main independent variables: bank characteristics and various financial ratios that are collected from Bankscope database, and three main country specific indicators which are discussed in the previous chapter (regulatory and supervisory, macroeconomic and the world aggregate governance variables) that are obtained from different sources. These sources are listed in Table (6.2) as follows:

Table (6.2): Data Sources for Bank's Analysis

Data	Source
Bank credit ratings	Fitch
Various financial ratios	Bankscope
Regulatory and Supervisory variables	World Bank Regulation and Supervision
Macroeconomic variables	IMF World Economic Outlook
World governance indicators	World Bank

6.2.1 Banks Credit Ratings

In contrast to the country ratings dataset, the estimation of banks ratings maintains one dependent variable of interest, but from different rating agency that is Fitch's Long Term Issuer Ratings, this has been selected due to the availability of data for MENA banks. The credit rating agency distinguishes between domestic and international long-term issuer ratings, although, upon inspection, the two were identical in all cases for the banks included in the study. By using Thomson Reuters Eikon software, the ratings for MENA banks have been gathered and are being assigned one of 21 possible ratings. The transformation of the alphanumeric ratings to ordinal numeric rankings is given in Table (6.3). Similar to the country ratings transformation, this has been converted based on how it was employed by (e.g. Pasiouras et al., 2006; Afonso, Gomes, and Rother, 2007). Single letter values were assigned numerical values from AAA=21 to DDD, DD, D=1 (See Appendix 6 - A for MENA banks ratings and its transformation scales).

In terms of total data points, the Fitch's bank ratings dataset comprises 965 observations, with the most common ratings being A- at 152, BBB+ at 118, and A at 98. On the other end, the least common ratings are CCC at 1, C at 1, and DDD at 3. A summary plot of how the average rating for banks has changed through time is in Figure (6.1). Interestingly, the average rating for banks declined from 2001 to 2002, and has since been consistently increasing, including the 2008 and 2009 years of the world's financial crisis.

Table (6.3): Fitch Long Term Issuer for MENA Bank Ratings

Rating	Fitch's Bank Ratings Linear Transformation	Count
AA-	18	10
A+	17	76
A	16	98
A-	15	152
BBB+	14	118
BBB+	14	6
BBB	13	59
BBB-	12	90
BB+	11	57
BB	10	59
BB-	9	81
B+	8	41
B	7	73
B-	6	40
CCC	4	1
C	2	1
DDD	1	3
Total		965

Average Banks' Ratings by Year
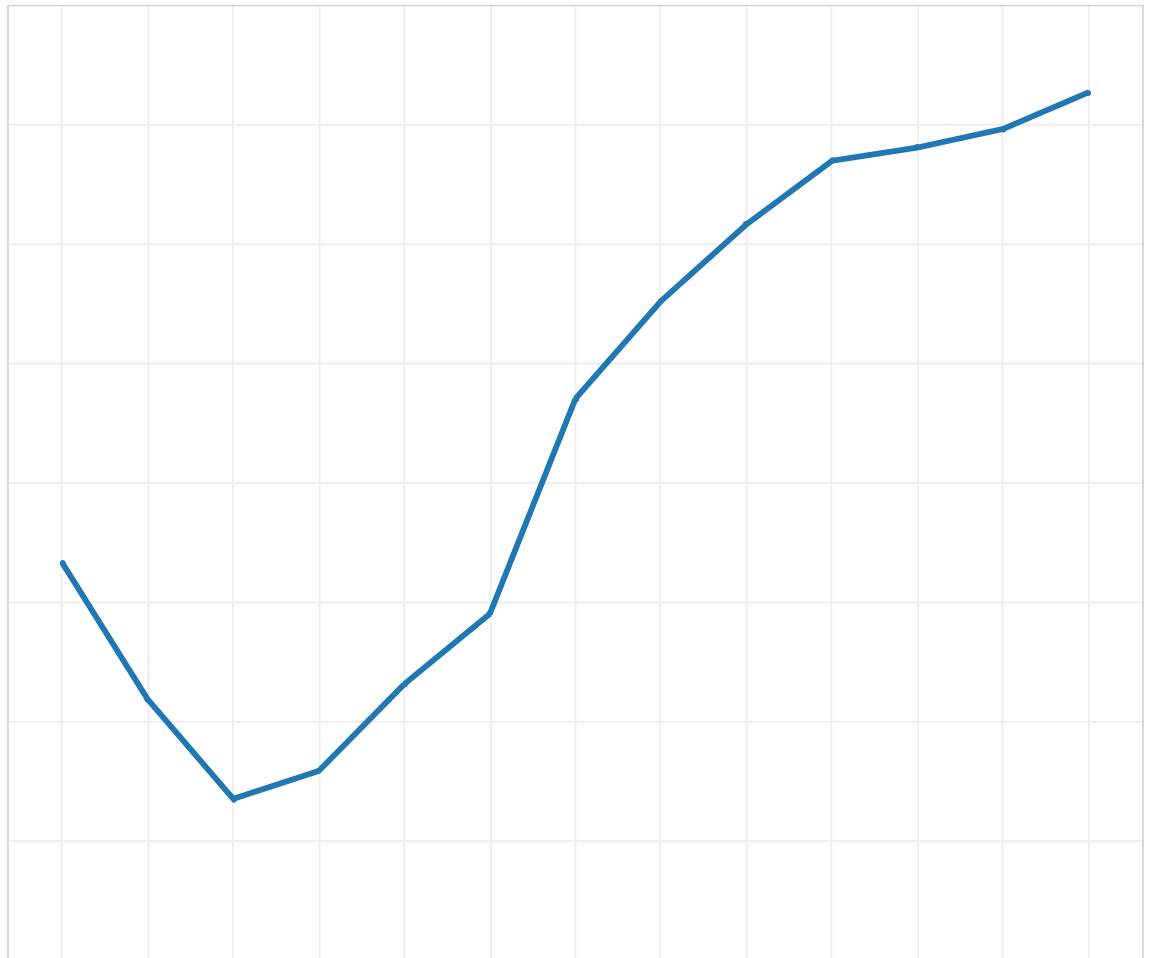
Figure (6.1): Average MENA Bank' Ratings by Year

6.2.2 Independent Variable (Financial Ratios)

The entire database comprises 12 bank characteristics and financial ratios. These financial ratios are described in Table (6.4). Overall, the financial ratios encompass four broad categories, including operations, capital, asset quality, and liquidity, besides the bank size by using the logarithm of total assets.

Table (6.4): Bank Characteristics and Financial Ratios

Symbol	Variable
FR1	Net Interest Margin (NIM)
FR2	Return on Average Assets (ROAA)
FR3	Return on Average Equity (ROAE)
FR4	Cost to Income Ratio
FR5	Total Capital Ratio
FR6	Equity to Total Asset Ratio
FR7	Capital Funds to Liabilities Ratio
FR8	Loan Loss Reserves to Gross Loans
FR9	Net Loans to Total Assets
FR10	Net Loans to ∑(Customer Deposits and Short-term Funding)
FR11	Liquid Assets to ∑(Customer Deposits and Short-term Funding)
FR12	Logarithm of Total Assets

A descriptive summary of each of the 12 financial ratio variables is presented in Table (6.5). In details, the Net Interest Margin (FR1) ranges from -1.48 to 40.82, with a mean of 3.94 and a standard deviation of 2.85. Return on Average Assets (FR2) ranges from -26.55 to 13.20, with a mean of 1.89 and a standard deviation of 1.98. Return on Average Equity (FR 3) ranges from -443.31 to 245.26, with a mean of 14.12 and a standard deviation of 22.40. Cost to Income Ratio (FR 4) has a mean of 44.95, a median of 42.57, and a minimum/maximum range from 9.04 to 509.74. The Total Capital Ratio (FR 5) has a mean of 18.47, a median of 16.81, and a minimum/maximum range of 0 to 183. Equity to Total Asset Ratio (FR 6) has a minimum of -0.97, a maximum of 98.93, a mean of 13.76, and a standard deviation of 8.07. The

Capital Fund to Liability Ratio (FR 7) ranges from -0.96 to 111.63, with a mean of 15.97 and a standard deviation of 9.19. The Loan Loss Reserves to Gross Loans (FR 8) ranges from 0 to 38.59, with a mean of 4.88 and a standard deviation of 4.25. Net Loans to Total Assets (FR 9) has a mean of 56.19, a standard deviation of 14.01, and a range (minimum/maximum) from 6.42 to 89.59. Net Loans to the sum of Consumer Deposits and Short-term Funding (FR10) ranges from 13.79 to 541.91, with a mean of 76.68 and a standard deviation of 35.49. Liquid Assets to the sum of Consumer Deposits to Short-term Funding (FR 11) ranges from 2.46 to 943.96, with a mean of 33.81, a median of 28.92, and a standard deviation of 35.66. The log of Total Assets ranges from 17.07 to 25.45, with a mean of 22.80, a median of 22.84, and a standard deviation of 35.66.

Table (6.5): Financial Ratios Summary Statistics

	Mean	St.Dev.	Median	Max	Min	Skewness	Kurtosis
FR 1	3.94	2.85	3.35	40.82	-1.48	6.07	55.88
FR 2	1.89	1.98	1.85	13.20	-26.55	-3.45	61.50
FR 3	14.12	22.40	14.83	245.26	-443.31	-9.12	206.36
FR 4	44.95	22.63	42.57	509.74	9.04	9.96	190.64
FR 5	18.47	8.70	16.81	183.00	0.00	9.14	155.02
FR 6	13.76	8.07	11.99	98.93	-0.97	3.82	25.88
FR 7	15.97	9.19	14.27	111.63	-0.96	5.35	45.52
FR 8	4.88	4.25	3.86	38.59	0.00	2.95	12.51
FR 9	56.19	14.01	57.77	89.59	6.42	-0.50	0.10
FR 10	76.68	35.49	74.48	541.91	13.79	5.13	49.28
FR 11	33.81	35.66	28.92	943.96	2.46	17.83	443.90
FR 12	22.80	1.34	22.84	25.45	17.07	-0.32	-0.15

6.2.3. Other Independent Variables

This sub-section describes almost the same independent variables that have been employed to estimate country's rating models in the previous chapter. To clarify, brief explanation of these main variables is discussed here for the purpose of estimating bank's rating models.

The dataset includes nine regulatory variables; these have been extracted from the World Bank survey regarding the regulation and supervision database. The survey is based on a multitude of Yes/No questions in a country. Consequently, a conversion into numerical values was required for the analysis and followed by the work of Pasiouras, Gaganis and Zopounidis (2006). Further details and summary of the variable symbols, statistics and the definitions are given in the previous chapters (see sub-section 5.2.1.2 and Table 5.3).

The bank's dataset also includes nine categories of macroeconomic variables; these are stemmed from the International Monetary Fund's October 2013 World Economic Outlook database. These categories with the associated symbol used and definitions with the statistics summary are given in the previous chapters (see sub-section 5.2.1.3 and table 5.4).

The World Aggregate Governance Indicators is another main independent variable is used for the bank's rating dataset; the database was developed and based upon the work of Kaufmann, Kraay and Mastruzzi (2010). The dataset includes six broad dimensions of governance, namely; Voice and

Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. A summary of these six indicators, symbols and statistics are given in the previous chapter (see sub-section 5.2.1.4 and Table 5.5).

Lastly, to distinguish between the conventional and Islamic banks, the dataset includes a dummy variable prescribed as (0) for non-Islamic banks, and (1) classified as a flag for Islamic banks in MENA countries. Of the 108 total banks, 16 are Islamic and 92 are non-Islamic banks.

6.3 Empirical Results

The empirical results section is divided into two sections. The first addresses the statistical results and the second summarises the results in relation to a priori theory. Similar to the country's estimations, STATA version 13 software was used for the banks data and the statistical presentations.

6.3.1 Banks Ratings Results

As an initial look at the bank ratings data, Table (6.6) contains the correlation of all variables in the dataset. As is evidenced, the financial ratio variables, macroeconomic variables, regulatory variables, and governance variables show no evidence of high correlation among the variables, with the exception of the six governance variables with appear to be highly correlated with each other and certain other regulatory and governance variables. The lowest

correlation coefficient between the governance indicators is 0.87 (G1 with G2), while most are correlated in the mid-to high 90s.

Table (6.6): Correlation for MENA Bank's Ratings Data

	Rankings	Islamic	fr1	fr2	fr3	fr4	fr5	fr6
Rankings	1.00							
Islamic	-0.07	1.00						
fr1	-0.50	0.12	1.00					
fr2	0.10	-0.04	0.29	1.00				
fr3	-0.08	-0.04	0.32	0.76	1.00			
fr4	-0.42	-0.04	0.06	-0.60	-0.42	1.00		
fr5	0.07	0.17	0.18	0.39	0.05	-0.37	1.00	
fr6	0.23	0.07	0.18	0.56	0.06	-0.48	0.75	1.00
fr7	0.30	0.07	0.08	0.45	-0.07	-0.32	0.68	0.91
fr8	-0.22	-0.02	-0.12	-0.16	0.00	0.13	0.06	-0.16
fr9	0.33	0.06	0.04	-0.13	-0.17	0.11	-0.37	-0.10
fr10	0.25	0.05	0.16	-0.07	-0.22	0.12	-0.09	0.16
fr11	-0.22	0.03	0.02	0.15	0.10	-0.01	0.38	0.23
fr12	0.39	-0.22	-0.29	-0.19	-0.07	0.05	-0.29	-0.27
rs1	-0.01	0.08	0.03	-0.10	-0.18	0.13	0.01	0.06
rs2	0.24	0.24	0.06	0.30	0.00	-0.38	0.47	0.56
rs3	0.53	0.19	-0.11	0.34	0.05	-0.44	0.30	0.49
rs4	-0.45	0.00	0.32	0.07	0.09	0.25	0.11	-0.05
rs5	-0.56	-0.12	0.47	0.16	0.25	0.04	0.12	0.00
rs6	-0.20	-0.05	0.17	0.16	0.19	-0.30	0.10	0.10
rs7	-0.38	-0.24	0.15	0.06	0.23	0.00	0.00	-0.13
rs8	0.49	0.12	-0.14	0.39	0.15	-0.48	0.36	0.49
rs9	0.25	0.17	0.02	0.27	-0.02	-0.34	0.44	0.50
macro1	-0.16	-0.02	0.22	0.22	0.19	-0.07	0.10	0.13
macro2	-0.33	-0.13	0.58	0.10	0.19	0.17	-0.17	-0.04
macro3	0.26	-0.24	-0.35	-0.32	-0.25	0.32	-0.29	-0.35
macro4	-0.19	-0.18	-0.11	-0.25	-0.11	0.13	-0.31	-0.30
macro5	0.24	-0.26	-0.30	0.03	0.12	-0.20	-0.16	-0.14
macro6	-0.48	0.04	0.35	0.03	0.13	0.15	0.01	-0.01
macro7	-0.57	0.08	0.24	-0.23	-0.06	0.51	-0.40	-0.41
macro8	-0.39	-0.04	-0.02	-0.29	-0.06	0.55	-0.24	-0.49
macro9	0.55	-0.17	-0.33	0.29	0.25	-0.46	0.11	0.14
g1voacc	0.27	0.20	0.01	0.19	-0.07	-0.16	0.32	0.40
g2pol	0.40	0.21	-0.04	0.36	0.06	-0.50	0.48	0.58
g3goveff	0.41	0.19	-0.09	0.22	-0.08	-0.26	0.35	0.46
g4regq	0.43	0.20	-0.09	0.25	-0.06	-0.31	0.39	0.49

g5law	0.44	0.20	-0.11	0.26	-0.04	-0.35	0.39	0.49
g6corr	0.43	0.20	-0.09	0.24	-0.06	-0.32	0.37	0.48
	fr7	fr8	fr9	fr10	fr11	fr12	rs1	rs2
fr7	1.00							
fr8	-0.17	1.00						
fr9	0.09	-0.46	1.00					
fr10	0.37	-0.42	0.88	1.00				
fr11	0.16	0.36	-0.62	-0.42	1.00			
fr12	-0.14	-0.02	0.27	0.20	-0.46	1.00		
rs1	0.14	-0.17	0.16	0.25	-0.07	0.14	1.00	
rs2	0.60	-0.09	0.11	0.27	0.15	-0.13	0.12	1.00
rs3	0.55	-0.14	0.26	0.31	0.03	0.02	0.06	0.84
rs4	-0.04	0.23	-0.20	-0.08	0.36	-0.14	0.31	0.10
rs5	-0.17	0.11	-0.41	-0.27	0.16	-0.23	0.22	-0.27
rs6	-0.13	-0.01	-0.40	-0.35	0.13	-0.24	0.12	-0.29
rs7	-0.34	0.17	-0.55	-0.56	0.25	-0.26	-0.27	-0.59
rs8	0.51	0.02	0.06	0.12	0.11	-0.02	-0.17	0.76
rs9	0.56	-0.03	0.12	0.28	0.11	-0.07	0.09	0.96
macro1	0.09	-0.23	0.01	0.08	-0.22	-0.09	-0.19	0.12
macro2	-0.12	-0.17	0.18	0.23	-0.32	0.08	0.13	-0.36
macro3	-0.19	-0.20	0.28	0.15	-0.32	0.29	0.18	-0.59
macro4	-0.37	-0.10	-0.09	-0.17	-0.13	0.00	0.09	-0.74
macro5	-0.23	-0.14	-0.10	-0.24	-0.18	0.01	-0.23	-0.62
macro6	-0.03	0.05	-0.13	-0.02	0.13	-0.14	-0.06	0.15
macro7	-0.37	0.02	0.10	0.04	-0.13	0.07	-0.01	-0.25
macro8	-0.42	0.35	-0.26	-0.33	0.33	0.01	0.07	-0.35
macro9	0.07	-0.13	-0.05	-0.15	-0.12	0.01	-0.39	-0.10
g1voacc	0.53	-0.09	0.28	0.39	0.05	0.02	0.07	0.92
g2pol	0.59	-0.03	0.06	0.18	0.19	-0.13	-0.08	0.94
g3goveff	0.58	-0.10	0.28	0.38	0.05	0.03	0.08	0.93
g4regq	0.60	-0.11	0.25	0.35	0.06	0.00	0.07	0.94
g5law	0.58	-0.09	0.22	0.31	0.08	-0.01	0.00	0.94
g6corr	0.58	-0.10	0.26	0.35	0.06	0.01	0.04	0.94
	rs3	rs4	rs5	rs6	rs7	rs8	rs9	macro1
rs3	1.00							
rs4	-0.12	1.00						
rs5	-0.50	0.40	1.00					
rs6	-0.36	-0.05	0.55	1.00				
rs7	-0.69	-0.04	0.59	0.62	1.00			
rs8	0.87	-0.09	-0.40	-0.41	-0.47	1.00		
rs9	0.80	0.21	-0.23	-0.37	-0.62	0.78	1.00	
macro1	-0.03	-0.10	0.20	0.02	0.06	0.08	0.14	1.00

macro2	-0.38	0.10	0.57	0.33	0.23	-0.38	-0.32	0.27
macro3	-0.41	-0.17	-0.12	-0.10	0.06	-0.43	-0.52	-0.09
macro4	-0.71	-0.26	0.32	0.54	0.57	-0.76	-0.78	0.02
macro5	-0.44	-0.51	0.06	0.43	0.53	-0.32	-0.63	0.08
macro6	-0.04	0.09	0.27	0.04	-0.06	-0.08	0.13	0.24
macro7	-0.33	0.28	0.06	-0.25	-0.06	-0.40	-0.23	0.04
macro8	-0.35	0.53	0.06	-0.22	0.13	-0.36	-0.31	-0.34
macro9	0.12	-0.51	-0.24	0.11	0.17	0.31	-0.09	0.12
g1voacc	0.85	0.14	-0.45	-0.58	-0.75	0.76	0.92	0.08
g2pol	0.90	-0.05	-0.38	-0.27	-0.51	0.89	0.90	0.10
g3goveff	0.89	0.06	-0.51	-0.54	-0.75	0.82	0.93	0.04
g4regq	0.91	0.04	-0.49	-0.49	-0.72	0.83	0.93	0.05
g5law	0.92	0.00	-0.51	-0.48	-0.69	0.86	0.93	0.05
g6corr	0.91	0.03	-0.52	-0.51	-0.72	0.84	0.93	0.03

	macro2	macro3	macro4	macro5	macro6	macro7	macro8	macro9
macro2	1.00							
macro3	0.09	1.00						
macro4	0.26	0.51	1.00					
macro5	0.08	0.56	0.70	1.00				
macro6	0.29	-0.29	-0.14	-0.31	1.00			
macro7	0.24	-0.14	0.02	-0.38	0.29	1.00		
macro8	-0.24	0.04	-0.02	-0.26	-0.10	0.50	1.00	
macro9	-0.17	0.27	0.04	0.74	-0.31	-0.59	-0.42	1.00
g1voacc	-0.37	-0.45	-0.85	-0.72	0.12	-0.07	-0.18	-0.16
g2pol	-0.44	-0.59	-0.75	-0.47	0.01	-0.39	-0.38	0.11
g3goveff	-0.43	-0.37	-0.81	-0.61	0.03	-0.22	-0.27	-0.03
g4regq	-0.44	-0.38	-0.80	-0.58	0.03	-0.28	-0.31	0.01
g5law	-0.47	-0.42	-0.81	-0.55	0.01	-0.28	-0.31	0.05
g6corr	-0.44	-0.41	-0.81	-0.58	0.00	-0.24	-0.29	0.01

	g1voacc	g2pol	g3goveff	g4regq	g5law	g6corr		
g1voacc	1.00							
g2pol	0.87	1.00						
g3goveff	0.98	0.91	1.00					
g4regq	0.97	0.93	1.00	1.00				
g5law	0.96	0.95	0.99	0.99	1.00			
g6corr	0.97	0.93	0.99	1.00	1.00	1.00		

6.3.2 OLS Regression of Bank Ratings

To begin with the regression analysis, Table (6.7) contains the Ordinary Least Squares (OLS) regression results. Overall, the OLS results give an R-squared of 0.88 with a Root Mean Squared Error (MSE) of 1.01. Interestingly, only ten of the 37 independent variables are statistically significant above the 90% level (t stat in parentheses).

The financial ratio variables significant in the OLS model include Net Interest Margin (fr1) at -0.22 (-1.88), Loan Loss Reserves to Gross Loans (fr8) at -0.06 (-1.88), Liquid Assets to the sum of Customer Deposits and Short-term Lending (fr11) at 0.02 (2.20), and Total Assets (log form) (fr12) at 0.87 (7.57). The sole regulatory variable of significance in the OLS model is Internal Management and Organisational Requirements (rs9) at 0.71 (1.87). On the macroeconomic variables, GDP per Capita (macro3) at 0.0001 (1.65) and Inflation (macro6) at -0.10 (-4.25) are statistically significant above 90%.

Lastly, four of the governance variables are statistically significant, including Voice and Accountability (g1) at -2.34 (-3.81), Political Stability (g2) at 0.99 (1.97), and Regulatory Quality (g4) at 2.75 (2.15). Because the dependent variables are in ordinal format and the dataset is in panel format, the OLS results are only presented as background. The following random effects ordered probit and logit results are most appropriate for the analysis at hand. In addition, the Breusch-Pagan test statistic indicates use of a panel model.

Table (6.7): OLS Regression Results for Banks Ratings

						N=228
						R-squared = 0.88
						MSE = 1.01
		Robust				
Rating	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Islamic Bank	-0.19	0.51	-0.38	0.70	-1.20	0.81
fr1	-0.22*	0.12	-1.88	0.06	-0.45	0.01
fr2	0.21	0.19	1.13	0.26	-0.16	0.59
fr3	-0.02	0.02	-0.99	0.32	-0.06	0.02
fr4	0.00	0.01	0.36	0.72	-0.02	0.03
fr5	-0.01	0.03	-0.37	0.71	-0.08	0.05
fr6	0.05	0.07	0.72	0.48	-0.09	0.19
fr7	-0.04	0.05	-0.89	0.38	-0.14	0.05
fr8	-0.06*	0.03	-1.88	0.06	-0.11	0.00
fr9	0.03	0.03	1.24	0.22	-0.02	0.09
fr10	0.01	0.01	0.37	0.71	-0.02	0.03
fr11	0.02**	0.01	2.20	0.03	0.00	0.04
fr12	0.87***	0.11	7.57	0.00	0.64	1.09
rs1	-0.12	0.17	-0.68	0.49	-0.46	0.22
rs2	0.37	0.65	0.57	0.57	-0.91	1.66
rs3	0.76	0.61	1.24	0.22	-0.45	1.97
rs4	-0.62	0.50	-1.25	0.21	-1.60	0.36
rs5	-0.25	0.26	-0.99	0.33	-0.76	0.25
rs6	-0.14	0.26	-0.53	0.60	-0.64	0.37
rs7	-0.16	0.16	-1.02	0.31	-0.47	0.15
rs8	-0.35	0.41	-0.84	0.40	-1.16	0.47
rs9	0.71*	0.38	1.87	0.06	-0.04	1.45
macro1	-0.07	0.06	-1.20	0.23	-0.18	0.04
macro2	0.0014	0.00	1.02	0.31	0.00	0.00
macro3	0.0001*	0.00	1.65	0.10	0.00	0.00
macro4	-0.99	0.69	-1.44	0.15	-2.34	0.36
macro5	0.88	0.69	1.28	0.20	-0.48	2.24
macro6	-0.10***	0.02	-4.25	0.00	-0.15	-0.06
macro7	0.09	0.10	0.94	0.35	-0.10	0.28
macro8	0.004	0.01	0.41	0.68	-0.02	0.03
macro9	-0.87	0.68	-1.28	0.20	-2.22	0.47
g1voacc	-2.34***	0.61	-3.81	0.00	-3.55	-1.13
g2pol	0.99**	0.50	1.97	0.05	0.00	1.98
g3goveff	-1.10	1.46	-0.75	0.45	-3.98	1.78
g4regq	2.75**	1.28	2.15	0.03	0.22	5.27
g5law	1.45	1.96	0.74	0.46	-2.42	5.32

| g6corr | -1.26 | 1.17 | -1.08 | 0.28 | -3.57 | 1.05 |
| _cons | -4.64 | 4.82 | -0.96 | 0.34 | -14.14 | 4.86 |

*90% significance, **95% significance, ***99% significance

6.3.2.1 OLS Robustness Checks

This sub-section presents checks for robustness, including inspections on heteroskedasticity, autocorrelation, collinearity, and non-normality.

6.3.2.2 OLS Heteroskedasticity

As reported in Figure (6.2), a heteroskedasticity check on the OLS residuals is likely with no surprise, the results indicate some interesting patterns, with the residuals exhibiting diagonal patterns. The diagonal patterns are the result of trying to fit an inefficient OLS model on panel data in ordered format. The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity fails to confirm heteroskedasticity, with a chi2(1) of 2.33 and a p of 0.13.
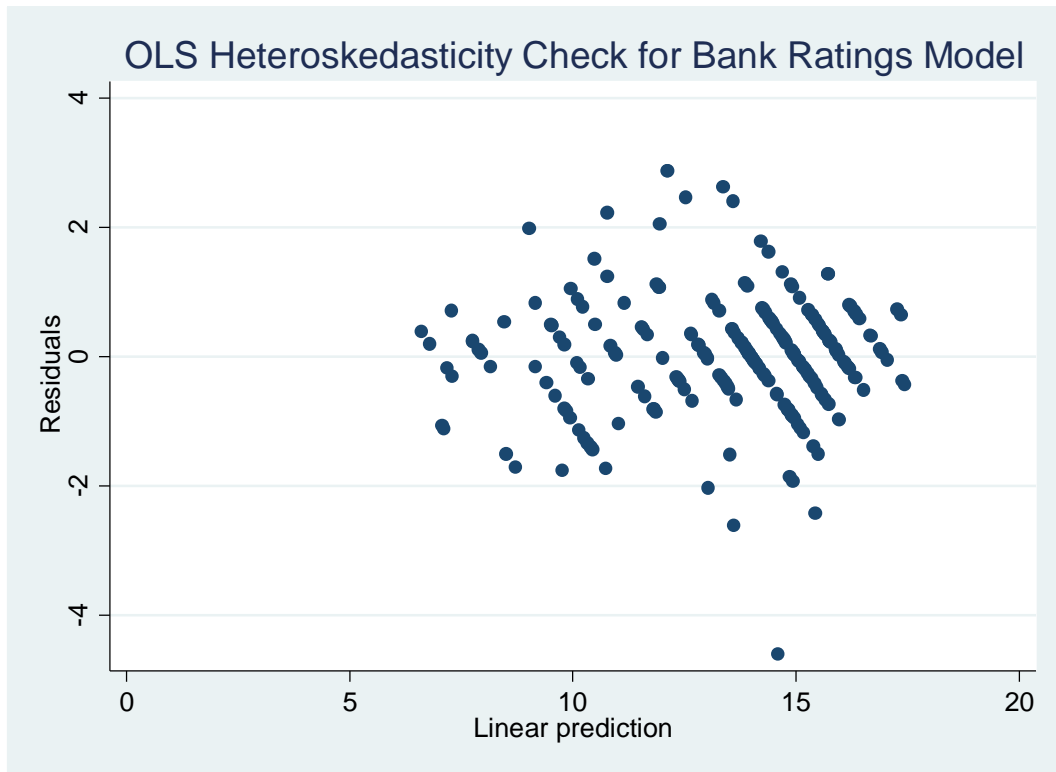
Figure (6.2): Heteroskedasticity Check on OLS Residuals for Banks Ratings

6.3.2.3 OLS Autocorrelation

The data include a time series component. Because of this, an Im-Pesaran-Shin unit-root test was performed first attempted on the ratings. The Im-Pesaran-Shin test failed because of insufficient observations. The lack of a result for the Im-Pesaran-Shin required the use of the Fisher-type unit root test. Table (6.8) presents the results. Overall, the result fails to reject the null hypothesis that all panels contain a unit root. The autocorrelation problem is addressed later in the chapter through the use of random effects ordered probit model and a random effects ordered logit model.

Table (6.8): Fisher-Type Unit Root Test for Banks Ratings

Fisher-type unit-root test for Ranking			
Based on augmented Dickey-Fuller tests			
		Statistic	p-value
Inverse chi-squared(202)	P	193.072	0.6619
Inverse normal	Z	3.8572	0.9999
Inverse logit t(424)	L*	2.1142	0.9825
Modified inv. chi-squared	Pm	-0.4442	0.6716

6.3.2.4 OLS Collinearity

The variance inflation factor tests are reported in Table (6.9). Unsurprisingly given the nature of the dataset, some of the variables suffer from collinearity ($VIF > 4$). Although the coefficient estimates in the model are not affected by collinearity, the standard errors are which affect the statistical significance of the estimates. This issue is addressed in the logit and probit models.

Table (6.9): OLS Collinearity Diagnostics for Banks Ratings

Collinearity Diagnostics				
		SQRT		R-
Variable	VIF	VIF	Tolerance	Squared
Ranking	8.51	2.92	0.12	0.88
Islamic	1.78	1.34	0.56	0.44
fr1	4.27	2.07	0.23	0.77
fr2	10.52	3.24	0.10	0.91
fr3	6.78	2.60	0.15	0.85
fr4	5.85	2.42	0.17	0.83
fr5	5.07	2.25	0.20	0.80
fr6	21.08	4.59	0.05	0.95
fr7	18.33	4.28	0.05	0.95
fr8	2.14	1.46	0.47	0.53
fr9	23.23	4.82	0.04	0.96
fr10	16.15	4.02	0.06	0.94

fr11	6.60	2.57	0.15	0.85
fr12	3.42	1.85	0.29	0.71
rs1	10.21	3.19	0.10	0.90
rs2	356.06	18.87	0.00	1.00
rs3	56.30	7.50	0.02	0.98
rs4	13.40	3.66	0.07	0.93
rs5	21.34	4.62	0.05	0.95
rs6	30.15	5.49	0.03	0.97
rs7	27.41	5.24	0.04	0.96
rs8	57.90	7.61	0.02	0.98
rs9	77.49	8.80	0.01	0.99
macro1	3.66	1.91	0.27	0.73
macro2	21.41	4.63	0.05	0.95
macro3	45.43	6.74	0.02	0.98
macro4	3,904.09	62.48	0.00	1.00
macro5	12,004.00	109.56	0.00	1.00
macro6	4.85	2.20	0.21	0.79
macro7	11.86	3.44	0.08	0.92
macro8	27.96	5.29	0.04	0.96
macro9	6,255.21	79.09	0.00	1.00
g1voacc	353.37	18.80	0.00	1.00
g2pol	212.37	14.57	0.00	1.00
g3goveff	1,239.40	35.21	0.00	1.00
g4regq	957.18	30.94	0.00	1.00
g5law	1,544.35	39.30	0.00	1.00
g6corr	589.48	24.28	0.00	1.00
Mean VIF	735.75			

6.3.2.5 OLS Omitted Variable Bias

The OLS results comprise 25 independent regression variables. Still, the data may suffer from omitted variable bias. To check for this, a Ramsey RESET test using powers of the fitted values was performed. The result gave an $F_{(3, 187)}$ value of 3.94 and a p-value of 0.01, meaning one rejects the null hypothesis of no omitted variable bias.

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6.3.2.6 OLS Non-Normality

The last robustness test reported here is consideration of non-normality. Table (6.10) reports the Skewness/Kurtosis/Shapiro-Wilk W tests for normality. The results indicate that the Ranking variable is not normally distributed in looking at the z value of 25.41 from the Shapiro-Wilk W test.

Table (6.10): OLS Normality Tests for Banks Ratings

Skewness/Kurtosis				
Variable	N	Pr (Skewness)	Pr (Kurtosis)	adj chi2 (2)	Prob>chi2
Ranking	965	0.00	0.00	69.31	0.00
Shapiro-Wilk W test				
Ranking	965	0.96	25.41	8.00	0.00

6.3.3 ANOVA

This section presents results of an analysis of variance model (ANOVA). As a note, ANOVA models do not allow non-integer or negative values as factors in an ANOVA model. Because of this, the reported macroeconomic and governance variables are in rounded thousands, with the variables transformed into all positive integers by adding to each column cell the minimum of the given variable. The results are reported in Table (6.11).

On the whole, the ANOVA model produces an R-squared of 0.91, with a Root Mean Squared Error (MSE) of 0.93. Of the variables with a strong relationship, all four are financial measures, with F values ranging from 2.98 to 46.14 and all significant at the 95% level or above. In contrast to the

financial variable results, none of the macroeconomic variables presented any significance level above 90%. Of the same kind to the macroeconomic variables' results, none of the governance variables exhibited any level of significance above 90%.

Table (6.11): ANOVA Regression Results for Banks Data

N=226				R-Sq=0.91	
Root MSE = 0.93				Adj- R-Sq=0.88	
Source	Partial SS	Df	MS	F	Prob > F
Model	1,463.20	50.00	29.26	34.12	0.00
Islamic bank	1.57	1.00	1.57	1.83	0.18
fr1ths**	3.44	1.00	3.44	4.01	0.05
fr2ths	1.76	1.00	1.76	2.05	0.15
fr3ths	0.30	1.00	0.30	0.35	0.56
fr4ths	0.09	1.00	0.09	0.11	0.74
fr5ths	1.37	1.00	1.37	1.60	0.21
fr6ths	0.31	1.00	0.31	0.36	0.55
fr7ths	0.81	1.00	0.81	0.94	0.33
fr8ths***	7.22	1.00	7.22	8.42	0.00
fr9ths	0.26	1.00	0.26	0.30	0.58
fr10ths	1.91	1.00	1.91	2.23	0.14
fr11ths	0.11	1.00	0.11	0.13	0.72
fr12ths***	39.57	1.00	39.57	46.14	0.00
rs1***	12.79	5.00	2.56	2.98	0.01
rs2	0.76	3.00	0.25	0.30	0.83
rs3	0.08	1.00	0.08	0.09	0.76
rs4	1.31	2.00	0.65	0.76	0.47
rs5	2.20	4.00	0.55	0.64	0.63
rs6	0.71	3.00	0.24	0.28	0.84
rs7	2.60	4.00	0.65	0.76	0.55
rs8	0.00	0.00			
rs9	0.00	0.00			
macro1ths	0.08	1.00	0.08	0.10	0.76
macro2ths	0.05	1.00	0.05	0.06	0.80
macro3ths	1.37	1.00	1.37	1.60	0.21
macro4ths	0.00	1.00	0.00	0.00	0.97
macro5ths	0.05	1.00	0.05	0.06	0.80
macro6ths	0.65	1.00	0.65	0.76	0.38
macro7ths	0.04	1.00	0.04	0.05	0.82

macro8ths	0.25	1.00	0.25	0.29	0.59
macro9ths	0.03	1.00	0.03	0.03	0.85
g1voaccths	1.44	1.00	1.44	1.68	0.20
g2polths	0.06	1.00	0.06	0.07	0.79
g3goveffths	0.00	1.00	0.00	0.00	0.98
g4regqths	0.28	1.00	0.28	0.32	0.57
g5lawths	0.44	1.00	0.44	0.51	0.48
g6corrths	0.00	1.00	0.00	0.00	0.98
Residual	150.08	175.00	0.86		
Total	1,613.27	225.00	7.17		
*90% level, **95% level, ***95% level					

6.3.3.1 ANOVA Robustness Checks

This sub-section presents checks for robustness, including inspections on heteroskedasticity, collinearity, and omitted variable bias of the ANOVA results.

6.3.3.1.1 ANOVA Heteroskedasticity

The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity confirms that heteroskedasticity is likely present, rejecting the null hypothesis of constant variance, with a chi2 (1) of 5.31 and a p value of 0.02.

6.3.3.1.2 ANOVA Collinearity

The variance inflation factor tests are reported in the following Table (6.12) and the results differ little from the OLS results, indicating collinearity problems.

Table (6.12): ANOVA Collinearity Diagnostics for Banks Ratings

		SQRT		R-
Variable	VIF	VIF	Tolerance	Squared
Ranking	8.39	2.90	0.12	0.88
Islamic	1.85	1.36	0.54	0.46
fr1ths	4.35	2.08	0.23	0.77
fr2ths	10.60	3.26	0.09	0.91
fr3ths	6.78	2.60	0.15	0.85
fr4ths	5.81	2.41	0.17	0.83
fr5ths	5.05	2.25	0.20	0.80
fr6ths	21.09	4.59	0.05	0.95
fr7ths	18.51	4.30	0.05	0.95
fr8ths	2.13	1.46	0.47	0.53
fr9ths	23.78	4.88	0.04	0.96
fr10ths	16.08	4.01	0.06	0.94
fr11ths	6.71	2.59	0.15	0.85
fr12ths	3.52	1.88	0.28	0.72
rs1	10.24	3.20	0.10	0.90
rs2	528.79	23.00	0.00	1.00
rs3	56.18	7.50	0.02	0.98
rs4	13.00	3.60	0.08	0.92
rs5	28.19	5.31	0.04	0.96
rs6	30.16	5.49	0.03	0.97
rs7	27.24	5.22	0.04	0.96
rs8	65.31	8.08	0.02	0.98
rs9	79.20	8.90	0.01	0.99
macro1ths	3.67	1.91	0.27	0.73
macro2ths	22.01	4.69	0.05	0.95
macro3ths	48.94	7.00	0.02	0.98
macro4ths	4,291.50	65.51	0.00	1.00
macro5ths	13,058.93	114.28	0.00	1.00
macro6ths	5.26	2.29	0.19	0.81
macro7ths	11.70	3.42	0.09	0.91
macro8ths	28.36	5.33	0.04	0.96
macro9ths	6,835.92	82.68	0.00	1.00
g1voaccths	356.45	18.88	0.00	1.00
g2polths	211.67	14.55	0.00	1.00
g3goveffths	1,208.93	34.77	0.00	1.00
g4regqths	961.17	31.00	0.00	1.00
g5lawths	1,507.82	38.83	0.00	1.00
g6corrths	575.66	23.99	0.00	1.00
Mean VIF	792.13			

6.3.3.1.3 ANOVA Omitted Variable Bias

The ANOVA results for omitted variable bias indicate a Ramsey RESET $F_{(3, 172)}$ value of 0.21 and a p-value of less than 0.89, meaning one fails to reject the null hypothesis of no omitted variable bias.

6.3.4 Random Effects Ordered Probit

With the results of the OLS and ANOVA models providing some interesting, albeit biased results, this section presents the random effects ordered probit model results. A random effect ordered probit model is the most likely fit for the data because the data are in a ranked, ordinal, and panel format. Details of theory and equations to fit a random effect ordered probit and logit models can be found on previous chapters (research methodology chapter 4 and the country rating models chapter 5).

An initial attempt at running the random effects ordered probit model in STATA produced the "adaptive quadrature failed to converge", indicating a need to check if the model was over-identified. Upon running various versions of a random effects ordered probit model, the exclusion of macro5 (Gross National Savings), macro6 (Inflation), g1 (Voice and Accountability), g2 (Political Stability), g4 (Regulatory Quality), g5 (Rule of Law), and g6 (Control of Corruption) enabled running of a full random effects model. The requirement to eliminate five of the six governance variables is not surprising given the high correlation between all six as indicated in the correlation table (Table 6.6). Table (6.13) contains the results. The Log likelihood is -237.4 and

the LR test vs. a simple ordered probit is 171.7, indicating the random effects ordered probit model is the correct model for the data set.

The statistically significant financial ratio variables are Net Interest Margin (fr1), Return on Average Assets (fr2), Return on Average Equity (fr3), Net Loans to the sum of Customer Deposits and Short-term Lending (fr10), Liquid Assets to the sum of Customer Deposits and Short-term Lending (fr11), and Logarithm of Total Assets (fr12).

The statistically significant regulatory variables include Capital Requirements (rs1), Deposit Insurance Scheme (rs2), Restrictions on Bank Activities (rs3), Official Disciplinary Power of Supervisory Agency (rs7), Liquidity and Diversification Requirements (rs8), and Internal Management and Organisational Requirements (rs9).

The sole statistically significant macroeconomic variable is the Unemployment Rate (macro7). The only governance variable included in the model – Governance Effectiveness (G3) is statistically insignificant. Lastly, the fixed effects flag for whether a bank is an Islamic bank is statistically insignificant using the 90% threshold, although, at the 83% level, being an Islamic bank increases the chances of a higher bank rating by a full two notches (coefficient = 2.15, p value = 0.17).

Table (6.13): Random Effects Ordered Probit Results for Banks Ratings

N = 228				Log likelihood = -237.4		
N groups = 48				LR chi2 (29) = 334.9		
				Prob > chi2 = 0.00		
Rating	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Islamic bank	2.15	1.55	1.39	0.17	-0.89	5.19
fr1	-0.84***	0.22	-3.81	0.00	-1.27	-0.41
fr2	0.69***	0.25	2.77	0.01	0.20	1.19
fr3	-0.08***	0.03	-3.00	0.00	-0.13	-0.03
fr4	0.001	0.02	-0.23	0.82	-0.04	0.04
fr5	0.02	0.06	0.43	0.67	-0.09	0.13
fr6	-0.05	0.14	-0.39	0.70	-0.32	0.21
fr7	-0.02	0.09	-0.27	0.79	-0.21	0.16
fr8	-0.06	0.05	-1.19	0.23	-0.16	0.04
fr9	0.001	0.05	0.01	0.99	-0.10	0.10
fr10	0.08***	0.03	2.41	0.02	0.01	0.14
fr11	-0.02*	0.01	-1.75	0.08	-0.05	0.00
fr12	2.24***	0.44	5.10	0.00	1.38	3.10
rs1	-0.50***	0.17	-3.02	0.00	-0.82	-0.18
rs2	-4.22***	1.30	-3.23	0.00	-6.77	-1.66
rs3	3.75***	0.74	5.08	0.00	2.30	5.19
rs4	0.21	0.48	0.45	0.66	-0.72	1.15
rs5	-0.48	0.43	-1.12	0.26	-1.31	0.36
rs6	-0.23	0.28	-0.84	0.40	-0.79	0.32
rs7	0.35***	0.14	2.45	0.01	0.07	0.63
rs8	-1.71***	0.61	-2.79	0.01	-2.92	-0.51
rs9	1.80***	0.63	2.88	0.00	0.58	3.03
macro1	-0.03	0.06	-0.46	0.64	-0.13	0.08
macro2	0.00	0.00	-0.52	0.60	-0.01	0.00
macro3	0.00	0.00	-1.56	0.12	0.00	0.00
macro4	-0.05	0.08	-0.57	0.57	-0.21	0.11
macro7	-0.94***	0.16	-6.03	0.00	-1.25	-0.64
macro8	-0.01	0.01	-1.00	0.32	-0.04	0.01
macro9	0.04	0.04	1.14	0.25	-0.03	0.12
g3goveff	1.84	1.24	1.49	0.14	-0.59	4.26
/cut1	33.49	12.64	2.65	0.01	8.72	58.26
/cut2	35.74	12.71	2.81	0.01	10.83	60.66
/cut3	37.42	12.79	2.92	0.00	12.35	62.50
/cut4	39.54	12.88	3.07	0.00	14.30	64.78
/cut5	40.98	12.91	3.17	0.00	15.68	66.28
/cut6	43.10	12.97	3.32	0.00	17.68	68.52
/cut7	45.06	13.02	3.46	0.00	19.54	70.58

/cut8	47.01	13.06	3.60	0.00	21.41	72.61
/cut9	49.95	13.17	3.79	0.00	24.14	75.75
/cut10	52.32	13.22	3.96	0.00	26.41	78.23
/cut11	56.68	13.42	4.22	0.00	30.38	82.98
/cut12	60.08	13.55	4.43	0.00	33.52	86.64
/sigma2_u	7.96	2.49			4.31	14.69
LR test vs. oprobit regression: chibar2(01) = 171.73 Prob>=chibar2 = 0.0000						
*90% level, **95% level, ***99% level						

6.3.5 Random Effects Ordered Logit

The previous section presented the results of the random effects ordered probit model. This section presents the results of the random effects ordered logit (see Table 6.14). As mentioned previously, the results reported below exclude macro5 (Gross National Savings), macro6 (Inflation), g1 (Voice and Accountability), g2 (Political Stability), g4 (Regulatory Quality), g5 (Rule of Law), and g6 (Control of Corruption) due to collinearity problems.

Similar to the probit results, 13 of the independent predictors are statistically significant in the logit framework. The statistically significant variables include:

- Net Interest Margin (fr1) with an odds-ratio of 0.22 (p value less than 0.01);

- Return on Average Assets (fr2) with an odds-ratio of 3.53 (p value = 0.01);

- Return on Average Equity (fr3) with an odds-ratio of 0.86 (p-value less than 0.01);

- Net Loan to the sum of Customer Deposits and Short-term Funding (fr10) with an odds-ratio of 1.14 (p value = 0.02);

- Liquid Assets to the sum of Customer Deposits and Short-term Funding (fr11) with an odds-ratio of 0.96 (p value = 0.09);

- Logarithm of Total Assets with an odds ratio of 67.04 (p value less than 0.01);

- Capital Requirements (rs1) with an odds-ratio at 0.37 (p value less than 0.01);

- Deposit Insurance Scheme (rs2) with an odds-ratio of 0.001 (p value less than 0.01);

- Restrictions on Bank Activities (rs3) with an odds-ratio of 942.69 (p value less than 0.01);

- Official Disciplinary Power of the Supervisory Agency (rs7) with an odds-ratio of 1.83 (p value = 0.02);

- Liquidity and Diversification Requirements (rs8) with an odds-ratio of 0.05 (p value = 0.01);

- Internal Management and Organisational Requirements (rs9) with an odds-ratio of 26.49 (p value less than 0.01);

- Unemployment Rate (macro7) with an odds-ratio of 0.19 (p value less than 0.01).

The results are somewhat surprising in relation to theory. First, only six of the financial variables are statistically significant. The results on Net Interest Margin, Return on Average Assets, Return on Average Equity, Net Loans to Deposits, Liquid Assets to Deposits, and Logarithm of Total Assets do not possess, at least on the surface, strong reasons for having stronger correlations than the insignificant variables. The insignificant variables are

Cost to Income Ratio, Total Capital Ratio, Equity to Total Asset Ratio, Capital Funds to Liabilities Ratio, Loan Loss Reserves to Gross Loans, and Net Loans to Total Assets. This is discussed in the later section 6.4.

Second, a surprisingly six of the nine regulatory variables are statistically significant and three of the statistically significant variables have an odds-ratio less than one. It is not readily apparent, although discussed later, why, for example, Capital Requirements or Liquidity and Diversification Requirements would have statistically significant odds-ratios less than one and Restrictions on Bank Activities or Internal Management and Organisational Requirements have odds-ratios much greater than one.

Third, only one of the seven included macroeconomic variables, Inflation, is statistically significant. These results might stem from the countries included in the study. The finding that the other six are statistically insignificant is interesting in that ratings agencies will often say they consider government debt or macroeconomic conditions in their evaluations. The evaluation may be more of a holistic approach in the context of ratings agencies evaluating the more important financial ratios – at least when it comes to rating banks. Fourth, the sole governance variable – Political Stability and Absence of Terrorism/Violence – also says something about how banks are rated.

Lastly, the logit model did not produce a strongly significant result for the Islamic bank fixed effect, although, the odds-ratio is quite high at 54.93 and significant at the 84% level.

Table (6.14): Random Effects Ordered Logit Results for Banks Ratings

N = 228				Log likelihood = -237.5		
N groups = 48				LR chi2 (29) = 333.4		
				Prob > chi2 = 0.00		
Rating	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
Islamic bank	54.93	154.98	1.42	0.16	0.22	13,851.66
fr1	0.22***	0.09	-3.68	0.00	0.10	0.49
fr2	3.53***	1.65	2.69	0.01	1.41	8.83
fr3	0.86***	0.04	-3.01	0.00	0.78	0.95
fr4	0.99	0.04	-0.14	0.89	0.93	1.07
fr5	1.04	0.10	0.41	0.69	0.86	1.27
fr6	0.91	0.22	-0.41	0.69	0.56	1.46
fr7	0.98	0.16	-0.13	0.90	0.71	1.35
fr8	0.92	0.09	-0.90	0.37	0.76	1.11
fr9	1.02	0.09	0.18	0.86	0.85	1.21
fr10	1.14**	0.07	2.34	0.02	1.02	1.28
fr11	0.96*	0.02	-1.69	0.09	0.91	1.01
fr12	67.04***	56.49	4.99	0.00	12.85	349.66
rs1	0.37***	0.12	-3.19	0.00	0.20	0.68
rs2	0.001***	0.00	-3.16	0.00	0.00	0.06
rs3	942.69***	1,299.23	4.97	0.00	63.28	14,044.49
rs4	1.21	1.06	0.22	0.83	0.22	6.71
rs5	0.46	0.35	-1.01	0.31	0.10	2.07
rs6	0.74	0.38	-0.59	0.56	0.27	2.03
rs7	1.83**	0.47	2.36	0.02	1.11	3.03
rs8	0.05***	0.05	-2.70	0.01	0.01	0.44
rs9	26.49***	30.18	2.88	0.00	2.84	247.02
macro1	0.94	0.09	-0.64	0.52	0.77	1.14
macro2	1.00	0.00	-0.40	0.69	0.99	1.01
macro3	1.00	0.00	-1.48	0.14	1.00	1.00
macro4	0.93	0.14	-0.47	0.64	0.69	1.25
macro7	0.19***	0.06	-5.67	0.00	0.11	0.34
macro8	0.98	0.03	-0.73	0.46	0.93	1.03
macro9	1.09	0.08	1.28	0.20	0.95	1.25
g3goveff	27.81	62.09	1.49	0.14	0.35	2,212.86
/cut1	66.63	23.96	2.78	0.01	19.67	113.59
/cut2	70.69	24.11	2.93	0.00	23.42	117.95
/cut3	73.77	24.31	3.03	0.00	26.12	121.43
/cut4	77.74	24.53	3.17	0.00	29.67	125.81
/cut5	80.47	24.63	3.27	0.00	32.20	128.75
/cut6	84.39	24.78	3.41	0.00	35.82	132.96

/cut7	87.88	24.90	3.53	0.00	39.08	136.67
/cut8	91.36	24.99	3.66	0.00	42.39	140.33
/cut9	96.78	25.21	3.84	0.00	47.36	146.19
/cut10	101.13	25.35	3.99	0.00	51.45	150.82
/cut11	108.86	25.75	4.23	0.00	58.38	159.33
/cut12	115.01	26.03	4.42	0.00	63.98	166.03
/sigma2_u	26.55	8.60			14.07	50.11
LR test vs. ologit regression: chibar2(01) = 150.18 Prob>=chibar2 = 0.0000						
*90% level, **95% level, ***99% level						

6.3.6 Comparison between Random Effects Ordered Probit and Logit

As discussed in the previous chapter, the AIC and BIC criteria are used to compare the probit model results to the logit one results. Table (6.15) presents the results of such a comparison. The results are broadly similar.

Table (6.15): AIC and BIC of Probit vs. Logit Models for Banks Ratings

Probit Model AIC and BIC					
Obs	ll(null)	ll(model)	df	AIC	BIC
228.00	-404.89	-237.42	43.00	560.85	708.31
Logit Model AIC and BIC					
Obs	ll(null)	ll(model)	df	AIC	BIC
228.00	-404.24	-236.51	43.00	559.03	706.49

6.4 Critical Discussion of the Empirical Results

With the empirics now established, this section discusses both models' results in relationship to a priori theory. Also, as mentioned, the probit and logit models fit the data about the same. A comparison of both results is given in Table (6.16) below.

Table (6.16): Random Effects Ordered Probit vs. Logit Results for Banks Ratings

N = 228				
N groups = 48				
	Probit		**Logit**	
Ranking	dy/dx	P>z	Odds-Ratio	P>z
Islamic bank	2.15	0.17	54.93	0.16
fr1	-0.84***	0.00	0.22***	0.00
fr2	0.69***	0.01	3.53***	0.01
fr3	-0.08***	0.00	0.86***	0.00
fr4	0.001	0.82	0.99	0.89
fr5	0.02	0.67	1.04	0.69
fr6	-0.05	0.70	0.91	0.69
fr7	-0.02	0.79	0.98	0.90
fr8	-0.06	0.23	0.92	0.37
fr9	0.001	0.99	1.02	0.86
fr10	0.08**	0.02	1.14**	0.02
fr11	-0.02*	0.08	0.96*	0.09
fr12	2.24***	0.00	67.04***	0.00
rs1	-0.50***	0.00	0.37***	0.00
rs2	-4.22***	0.00	0.001***	0.00
rs3	3.75***	0.00	942.69***	0.00
rs4	0.21	0.66	1.21	0.83
rs5	-0.48	0.26	0.46	0.31
rs6	-0.23	0.40	0.74	0.56
rs7	0.35***	0.01	1.83**	0.02
rs8	-1.71***	0.01	0.05***	0.01
rs9	1.80***	0.00	26.49***	0.00
macro1	-0.03	0.64	0.94	0.52
macro2	0.00	0.60	1.00	0.69
macro3	0.00	0.12	1.00	0.14
macro4	-0.05	0.57	0.93	0.64
macro7	-0.94***	0.00	0.19***	0.00
macro8	-0.01	0.32	0.98	0.46
macro9	0.04	0.25	1.09	0.20
g3goveff	1.84	0.14	27.81	0.14
*90% significance, **95% significance, ***99% significance				

The first variable is the dummy variable for whether a bank is an Islamic one or not. The significance level for the probit model is 83% and 84% for the logit model. The marginal effect from the probit model is 2.15, while the odds-ratio for the logit model is 54.93. Although statistically insignificant, the result is consistent with the theory that Islamic banks may budget and do business in a more conservative manner, and thus receive higher ratings on the order of two ranks if one uses the marginal effects from the probit model.

The next variable is Net Interest Margin (fr1). The result is statistically significant and consistent in direction from both models, with the probit model marginal effect at -0.84 and the logit model odds-ratio at 0.22. The result indicates that banks with higher net interest margins generally receive lower ratings. This might be the result of the nature of the banking business. Banks with a higher net interest margin may be dealing with more risky customers, and thereby receive a lower rating. Another explanation is the wealth effect. Essentially, wealthy customers' money usually migrates to the highest yielding bank and banks that pay a higher yield generally have a lower Net Interest Margin. By the same token, wealthy customers are generally customers are safer banks, which explains the higher ratings for banks with lower Net Interest Margin.

The third variable is Return on Average Assets (fr2). The statistically significant result from the probit model is a marginal effect of 0.69 and from the logit model an odds-ratio of 3.53. This result simply implies that banks that

earn the most on their assets generally possess less risk because better managers run the banks.

The fourth variable is Return on Average Equity (fr3). In theory, the explanation behind this finding is consistent with the previous finding on the Return on Average Assets. Better managers generally run banks with the exhibited ability to maximize the return on their equity. Apparently, rating agencies generally reward banks with better managers with higher ratings.

The fifth statistically significant variable is Net Loans to the sum of Customer Deposits and Short-term Funding (fr10), with a marginal effect of 0.08 (probit) and an odds-ratio of 1.14 (logit). This finding of a positive relationship is somewhat surprising given the common sense view that the higher the loan balance sheet is relative to customer deposits and short-term funding, the greater the risk. The finding might stem from assumption that better managers run banks that make more money, and banks that make the most money generally have high loan balances.

The sixth statistically significant variable is Liquid Assets to the sum of Customer Deposits and Short-term Funding (fr11), with a marginal effect of -0.02 and an odds-ratio of 0.96. Akin to the finding on Net Loans to the sum of Customer Deposits and Short-term Funding (fr10), this result is somewhat surprising. One would think that banks with higher liquid assets would receive a higher rating because of the ability to cover any losses from bad loans or other unprofitable banking activities. Perhaps, consistent with the finding just

mentioned on net loans, rating agencies view banks with a high balance in liquid assets as an indication of poor management. Banks with perceived poor management would generally receive lower ratings on their debt. The result could also be the result of the reason behind certain banks having high liquid assets. Essentially, banks may be holding high liquid balances because of higher volume in risky loans, and banks with more risky loans need a higher liquid asset balance to cover any potential losses. Apparently, ratings agencies view it this way.

The seventh and last financial ratio with statistical significance is the Logarithm of Total Assets (fr12), with a marginal effect of 2.24 and an odds-ratio of 67.04. The very large and strong statistical relationship indicates that ratings agencies consider assets as an indication of safety. This finding is in line with a study was conducted by Czarnitzki and Kraft (2004) who confirmed that credit ratings will be improved with the increase of any firm size, value added per employee and the firm age.

The other six financial variables are statistically insignificant. The variables are Cost to Income Ratio (fr4), Total Capital Ratio (fr5), Equity to Total Asset Ratio (fr6), Capital Funds to Liabilities Ratio (fr7), Loan Loss Reserves to Gross Loans (fr8), and Net Loans to Total Assets (fr9). The finding of statistical insignificance on these six financial variables compared with the results from the previous seven is not completely explainable with theory. Why would Net Loans to the sum of Customer Deposits and Short-term Funding (fr10) provide an indication of a banks rating while the Total Capital

Ratio does not?   With this as an overarching question mark, some of the statistical insignificance is explainable.

The first statistically insignificant financial variable is the Cost to Income Ratio (fr4). This result likely indicates that ratings agencies care little about what banks are spending to run their business or the amount of money they are making. As mentioned previously, ratings agencies care about a bank's ability to repay debt, and apparently the cost to run a bank is not related to the risk of paying back bank debt.

The second statistically insignificant financial variable is Total Capital Ratio. This result might be an issue with the definition of the numerator of the Total Capital Ratio. The numerator is the sum of Tier 1 and Tier 2 Capital. Tier 2 Capital includes risky assets as well as safe assets, so the ratio apparently isn't different enough for the highly rated banks compared to the lowly rated banks to tell a difference on rating agencies' thinking.

The third statistically insignificant variable is Equity to Total Asset Ratio (fr6). This might stem from rating agencies' lack of concern equity as an indication of the riskiness of a banks' debt. As mentioned, ratings agencies concern themselves more with the ability of the given bank to pay back issued debt.

The fourth statistically insignificant variable is the Capital Fund to Liabilities Ratio (fr7). This finding lacks no readily apparent explanation. Rating agencies certainly look at the liability of banks when arriving at a rating, as

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well as the ability to cover that liability with available funds. This result might have something to do with the definition of Capital Funds.

The fifth statistically insignificant financial variable is Loan Loss Reserves to Gross Loans (fr8). This finding might stem from two competing factors. Rating agencies certainly care about banks' ability to cover their gross loan exposure, which would indicate a positive relationship between loan loss reserves and gross loans. On the other end, banks with higher loan loss reserves to gross loans have a higher balance for a reason, meaning that riskier banks keep more in reserve to cover riskier loans. These two competing factors may explain the observed statistical insignificance.

The sixth and last statistically insignificant financial variable is Net Loans to Total Assets (fr9). When comparing this result to the results on Net Loans to the sum of Customer Deposits and Short-term Funding (fr11) and Liquid Assets to the sum of Customer Deposits and Short-term Funding (fr12), it might indicate that rating agencies probably give more attention to funds available to pay for debt. Essentially, available funds is more important than assets available to a bank, perhaps because it takes time and legal issues to free up some assets if there is insufficient cash to cover interest payments on loans.

In general, the above findings in relation to the profitability, capital, asset quality, liquidity and bank size are consistent with the existing literature and empirical studies such as; Poon, Firth and Fung (1999), Doumpos and

Pasiouras (2005), Grunert, Norden and Weber (2005), Poon and Firth (2005) and Pasiouras *et al.* (2006).

Moving on to the regulatory variables, the probit and logit models each show six of the nine indicators as statistically significant. The first variable strongly correlated regulatory variable is Capital Requirements (rs1). This variable has a marginal effect of -0.50 from the probit model and significant at greater than the 99% level. For the logit model, Capital Requirements has an odds-ratio of 0.37 and a statistical significance at greater than the 99% level. The 0.37 implies about a 2.7 to 1 higher likelihood for countries with less of a capital requirement burden to have a higher bond rating, compared to 0.50 for the probit result. Although the two differ by a reasonable amount, the two are consistent in direction. This result is given the popular view that capital requirements act as a backstop when the financial system is under stress. The finding, though, may be the result of the effect higher capital requirements have on overall economic growth and thus, a given bank's balance sheet. Essentially, if countries impose higher capital requirements, this may result in lower overall GDP and similar macroeconomic measures, which might put downward pressure on bond ratings. Another potential channel in which this shows up is in banking practice. Banks that keep more money in inactive liquid assets are likely riskier and riskier banks generally receive a lower bond rating.

The second statistically related regulatory variable is Deposit Insurance Scheme (rs2), with a probit model estimated marginal effect of -0.50 and a

logit odds-ratio of 0.0001. Both models are statistically significant above the 99% level. Interestingly, both models produce strongly adverse effects a Deposit Insurance Scheme has on a given bank's rating. This might indicate that banks operating or headquartered in countries with deposit insurance schemes may be riskier banks and thus receive lower ratings. Another possible explanation is that the deposit insurance scheme itself has an adverse effect on economic growth, with banks operating in countries with poor economies receiving lower ratings.

The third statistically significant regulatory variable is Restrictions on Bank Activities (rs3). The variable has a marginal effect coefficient of 3.75 and an odds-ratio of 942.69. Both are statistically significant above the 99% level. Perhaps surprisingly, the result show that restrictions on banking activity may lead to higher bond ratings. This finding might stem from the mindset of a rating agency. A rating agency is, again, concerned about banks' ability to repay their liabilities. By countries imposing restrictions on banking activities, it may make banking safer, which would explain rating agencies giving higher ratings to banks operating in countries with restrictions on banks' activities.

The fourth statistically significant regulatory variable is Official Disciplinary Power of the Supervisory Agency (rs7). The variable has a marginal effect from the probit model of 0.35 and an odds-ratio of 1.83 from the logit model. The result indicates that rating agencies not only care about the law, but on the enforcement of the law, as measured by the ability to discipline

nonconforming banks. The result is completely unsurprising given the apparently reduced risk bondholders have when banks can be disciplined.

In contrast to the findings of Pasiouras *et al.* (2006), the results show that banks in countries with higher restrictions on bank activities and official disciplinary power may lead to obtain higher credit ratings.

The fifth statistically significant regulatory variable is Liquidity and Diversification Requirements (rs8). This finding on liquidity and diversification requirements is completely unsurprising because it reduces risk. Interestingly, the finding is in the opposite direction one might have expected. Instead of liquidity and diversification requirements having a positive effect on a given bank's rating, the probit and logit models produce a negative effect. The marginal effect from the probit model is -1.71 and the odds-ratio from the logit model is 0.05. Apparently, rating agencies might be concerned about what banks are required to be involved in from the liquidity and diversification requirements, and that concern shows up in ratings. The result might simply be indicating that liquidity and diversification requirements are stemming from pre-assigned risk rather than post-assigned risk. Riskier banks may have higher liquidity and diversification requirements because they are riskier.

The sixth and last of the regulatory variables to exhibit any measure of statistical significance is Internal Management and Organisational Requirements (rs9). The probit marginal effect for this measure is 1.80, while the logit odds-ratio is 26.49. Overall, the results imply that country level

regulation on Internal Management and Organisational Requirements is viewed kindly by ratings agencies. Interestingly, if one compares this result to the opposite finding on government bond ratings, one gets a more complete view of rating agencies' thinking. Essentially, Internal Management and Organisational Requirements is a positive for banks' ratings because of the apparent decreased risk, while it has a negative effect on countries' ratings, perhaps due to the effect it might have on economic growth.

The remainder of the regulatory variables – Accounting and Disclosure Requirements (rs4), Auditing Requirements (rs5), and Entry into Banking Requirements (rs5) were statistically insignificant in both the probit and logit regressions. The finding on these three is unsurprising given that rating agencies get a complete view of a bank's balance sheet before a rating is issued. Because of this, rating agencies are apparently unconcerned with any accounting disclosure or auditing requirements because the rating agencies already have access to the information they need.

Additionally, most of the above findings with regards to this group are supported by previous empirical research which was conducted by Pasiouras *et al.* (2006).

The next grouping is the macroeconomic variables. The sole macroeconomic variable exhibiting statistical significance above 99% is the Unemployment

Rate[17]. Both the probit and logit models produce negative relationship between higher unemployment and lower bond ratings, with the marginal effect probit coefficient at -0.94 and the logit odds-ratio at 0.19. Both are statistically significant at above the 99% level. The result indicates that banks not only consider banks' balance sheets in assigning a rating, but also the condition of the economy in which the bank operates. In view of that, same conclusion has been reached by Les Bras and Andrews (2004) as well as Vuong (2007) to support this finding.

The remaining six macroeconomic variables are statistically insignificant. The statistical insignificance of Real GDP growth (macro1), GDP (macro2), GDP per Capita (macro3), Investment as a Percentage of GDP (macro4), Government Debt as a Percentage of GDP (macro8), and Current Account Balance as a Percentage of GDP (macro9) is unsurprising given the nature of the issue at hand – banks' ratings, as opposed to government ratings. The results indicate that safe and risky banks are generally equally likely to operate in countries with high and low GDP growth, high and low GDP per Capita and high and low government debt to GDP. These broader issues apparently matter little to the riskiness of a bank's ability to repay a loan, at least according to ratings agencies.

Moving on to the last group of predictor variables, that is World Governance Indicators. As mentioned, five of the six governance variables were dropped due to collinearity, including Voice and Accountability (g1), Political Stability

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[17] As a reminder, Savings as a Percentage of GDP (macro5) and Inflation (macro6) were dropped due to collinearity.

and Absence of Terrorism (g2), Regulatory Quality (g4), Rule of Law (g5), and Control of Corruption (g6).

The sole governance variable included was Government Effectiveness (g3). Interestingly, this variable was not significant above 90%, with both the probit and logit models produces statistical significance estimates of 86%. The direction of the statistically insignificant result is generally consistent with what one might think, with the marginal effect from the probit model at 1.84 and the odds-ratio at 27.81. The results indicate, akin to the finding on Official Disciplinary Power of the Supervisory Agency (rs6), that rating agencies may pay some attention to the government's actions in relation to banks.

To support this argument, Pasiouras, Gaganis and Zopounidis (2006) confirmed the importance use of the overall state of the economic environment and policies. They found that lower corruption, government bureaucracy and better quality of the legal system would make banks to be stable and achieve higher credit ratings.

6.5 Interlink between Country and Bank Ratings

It is quite common in economic circles to argue about the presence (or lack thereof) of endogeneity bias and the impact of time dependency. For reporting purposes, the following two Tables (6.19 and 6.18) report the results of Arellano-Bond regression for both banks' ratings and countries' ratings.

Interestingly, of the four lags reported, only one, Lag 1 of County Ratings, is statistically significant at the 95% level. Additional results including lags of the independent variables also show varying degrees of significance. As a note from the previous section's discussion, there are three reasons for not including time effects in the final regression model.

The reasons are, first, the nature of the dependent variable (ordered nature, which favours ordered probit or logit models). Second, the limited number of years in the data set (only 13 years, implying that elimination of a year or two for model fitting purposes eliminates some sample fit years). Third, excluding these variables provides limited insight into the final results (results of the correlations change by only marginal amounts).

Table (6.17): Arellano-Bond Results for Banks Ratings

Arellano-Bond Results for Banks Ratings						
N instruments = 84			Wald-chi2(31) = 133685.51			
			Prob > chi2 = 0.00			
Rating	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
L1.	0.23	0.12	1.82	0.07	-0.02	0.47
L2.	-0.13	0.12	-1.04	0.30	-0.36	0.11
Islamic bank	0.00	(omitted)				
fr1	-0.15	0.14	-1.07	0.29	-0.42	0.12
fr2	0.19	0.14	1.39	0.16	-0.08	0.47
fr3	-0.01	0.02	-0.94	0.35	-0.05	0.02
fr4	0.01	0.01	0.94	0.35	-0.01	0.03
fr5	0.09	0.05	1.66	0.10	-0.02	0.19
fr6	-0.10	0.09	-1.10	0.27	-0.28	0.08
fr7	-0.01	0.07	-0.17	0.86	-0.14	0.12
fr8	0.09	0.06	1.49	0.14	-0.03	0.20
fr9	0.00	0.04	-0.07	0.94	-0.09	0.08

Arellano-Bond Results for Banks Ratings						
N instruments = 84			Wald-chi2(31) = 133685.51			
			Prob > chi2 = 0.00			
Rating	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
fr10	0.02	0.03	0.67	0.50	-0.04	0.08
fr11	-0.03	0.01	-2.50	0.01	-0.05	-0.01
fr12	1.06	0.65	1.63	0.10	-0.21	2.33
rs1	-0.29	0.14	-2.14	0.03	-0.56	-0.02
rs2	-14.55	14.47	-1.01	0.32	-42.91	13.82
rs3	1.20	0.88	1.36	0.17	-0.53	2.93
rs4	-0.16	0.60	-0.27	0.79	-1.34	1.01
rs5	0.17	0.47	0.36	0.72	-0.76	1.10
rs6	0.05	0.37	0.15	0.88	-0.67	0.78
rs7	0.10	0.14	0.77	0.44	-0.16	0.37
rs8	-0.81	0.58	-1.40	0.16	-1.95	0.32
rs9	0.79	0.61	1.30	0.19	-0.40	1.99
macro1	-0.02	0.04	-0.57	0.57	-0.10	0.05
macro2	0.00	0.00	-0.15	0.89	-0.01	0.01
macro3	0.00	0.00	-0.16	0.87	0.00	0.00
macro4	-0.02	0.06	-0.30	0.76	-0.13	0.10
macro7	-0.16	0.12	-1.36	0.18	-0.39	0.07
macro8	-0.01	0.01	-0.98	0.33	-0.02	0.01
macro9	0.01	0.02	0.52	0.60	-0.04	0.06
g3goveff	1.67	1.14	1.47	0.14	-0.56	3.90
_cons	0.00	(omitted)				

Table (6.18): Arellano-Bond Results for Country's Ratings

Arellano-Bond Results on Country Ratings						
N = 64			Wald chi2(26) = 157.33			
			Prob > chi2 = 0.00			
Rating	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
L1.	0.31	0.16	1.98	0.05	0.00	0.62
L2.	-0.05	0.18	-0.30	0.77	-0.40	0.30
rs1	-0.26	0.15	-1.70	0.09	-0.57	0.04
rs2	-0.07	1.51	-0.05	0.96	-3.03	2.89
rs3	0.11	0.41	0.26	0.80	-0.70	0.91
rs4	-0.19	0.35	-0.55	0.58	-0.88	0.50

			Arellano-Bond Results on Country Ratings			
N = 64				**Wald chi2(26) = 157.33**		
				Prob > chi2 = 0.00		

Rating	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
rs5	0.10	0.30	0.33	0.74	-0.49	0.69
rs6	0.09	0.23	0.40	0.69	-0.35	0.54
rs7	0.08	0.11	0.72	0.47	-0.13	0.29
rs8	-0.49	0.54	-0.91	0.36	-1.54	0.56
rs9	0.48	0.66	0.73	0.47	-0.81	1.77
macro1	-0.03	0.07	-0.39	0.70	-0.16	0.11
macro2	0.00	0.00	-0.03	0.98	-0.01	0.01
macro3	-0.0001	0.00	-0.63	0.53	0.00	0.00
macro4	-0.06	0.46	-0.12	0.90	-0.95	0.84
macro5	0.09	0.46	0.19	0.85	-0.82	0.99
macro6	-0.04	0.03	-1.34	0.18	-0.11	0.02
macro7	-0.34	0.16	-2.19	0.03	-0.65	-0.04
macro8	-0.02	0.02	-0.89	0.37	-0.05	0.02
macro9	-0.08	0.46	-0.17	0.86	-0.97	0.81
g1voacc	0.51	1.05	0.48	0.63	-1.56	2.58
g2pol	0.43	0.60	0.72	0.47	-0.74	1.60
g3goveff	2.08	1.35	1.54	0.12	-0.57	4.72
g4regq	-1.03	1.36	-0.75	0.45	-3.69	1.64
g5law	2.52	1.53	1.64	0.10	-0.49	5.53
g6corr	-2.06	0.90	-2.29	0.02	-3.83	-0.30
_cons	13.50	6.57	2.06	0.04	0.63	26.37

With the results of both country credit rating models and bank credit rating models now analysed and discussed in chapter 5 and this chapter respectively, it remains to assess the importance of the findings in relation to the literature. Despite the growing interest of academics into the examination of both sovereign and banks credit ratings, interlink between these two types of credit rating models remains largely under-researched. Williams, Alsakka and Gwilym (2013) attempted to address this gap in the existing body of research and conducted a study on the effects of sovereign credit ratings on the credit ratings of banks. The authors focused on 54 emerging countries in

the period of 1999-2009. The conclusions drawn by the authors suggest a presence of a strong effect of the sovereign credit ratings on bank rating upgrades. These effects are mediated by countries' economic and financial freedom as well as macroeconomic conditions.

Furthermore, Correa *et al.* (2014) examined the similar effects in the context of 37 countries over the period 1995-2011. Focusing on both emerging and developed countries, the authors reported similar findings to the conclusions drawn by Williams, Alsakka and Gwilym (2013). As a result, a strong relationship between sovereign credit ratings and banks credit ratings has been established in the existing body of research on the topic. The underlying reason for this correlation can be found in the investors' perception of interconnectedness between sovereign credit ratings and banks credit ratings. Correa *et al.* (2014) attributed these perceptions to government guarantees suggesting that investors acknowledge the expected support from the banks' governments.

The relationship between country's credit ratings and bank credit ratings is however a two-way type of a relationship as highlighted by Rogers, Sedghi and Burn-Murdoch (2013). A supporting evidence for the effect of the bank credit ratings on the sovereign credit rating of a country can be found in the recent case of Cyprus. The weakening banks represented the key argument for the downgrade of the country's credit rating since the government was expected to provide additional financial support to the country's bank and hence, a threat to the sustainability of the government's debt burden has been predicted (Rogers, Sedghi and Burn-Murdoch, 2013).

To conclude, there is a strong interlink between countries and banks credit ratings. The ratings have been shown to go hand in hand under the influence of a two-way type of a relationship. While the sovereign credit rating affects the general perception of the creditworthiness of a bank, the bank's creditworthiness has also been shown to have an impact on the sustainability of the government rating as demonstrated on the example of Cyprus.

6.6 Summary

With regards to the discussion emerged on Hausman statistic as reported in chapter (5), the results of random effects model appears to fit the data well and has been employed because of the probit and logit order model structures. In this chapter (bank's estimations), the same procedure is followed by the previous chapter (country's estimations), the dependent variable is a binary outcome variable with independent fixed effects, which eliminates a fixed effects model from consideration in most binary panel model regressions. The banks rating (probit and logit) models as shown in Table (6.17) below indicate a Prob > chi2 (or Prob > chibar2 for probit models) of less than 0.01, indicating that the ordered probit and logit models reported provide more information than simply guessing the outcome of a given rating.

Table (6.29): Fit Results for the Bank's Ordered Logit/Probit Models

Banks Ratings Model (probit)	LR test vs. ordered probit regression: chibar2(01) = 171.73, Prob>chibar2 < 0.01.
Banks Ratings Model (logit)	LR test vs. ordered probit regression: chibar2(01) = 150.18, Prob>chibar2 < 0.01.

However, international banking has witnessed tremendous growth in the last decade which has brought with it increased risk with global consequences on financial services and products. International banks, just like a growth company, comes across a wide range of risks which include interest rate risk, foreign exchange risk in addition to the business risk and compliance risk and the counter for risks keep on increasing every day as the business grow, which affects a bank's credit rating. This chapter has provided the empirical assessment of a good range of financial and macroeconomic variables including; financial ratios, regulatory policy, macroeconomic variables, and governance factors in explaining and estimating bank level credit rating models to assess bond rating agencies' decision to rate a given bank.

Moreover, the rationale behind not using other dynamic panel data methods on the estimation for this research is because the time series component of the study includes 13 years for countries and banks with a complete data set history. In doing dynamic panel models, such as Generalized Method of Moments (GMM) or Arellano and Bover/Blundell regressions, one is assuming some time dependency in the dependent or independent variables, meaning that period t-1 may provide some information about period t.

One explanation for the exclusion of time effects is the small time sample included in the study. With only 13 years of 13 countries and 108 banks, employing one or two years for model fit eliminates 8% of the fitted sample for every lagged year included in the models.

As a note of caution, the Fischer-type unit-root test for the linear transformation of ratings for both banks and countries knowingly indicate the potential presence of unit roots.

As reported in Table (6.18) for banks and for countries, the Inverse chi-squared, Inverse normal, Inverse logit, and Modified inv. Chi-squared all fail to reject the null hypothesis that all panels contain unit roots.

Table (6.20): Fischer-type Unit Root Results

Fischer-type unit-root test for ratings				
Based on augmented Dickey-Fuller tests				
H0: All panels contain unit roots				
Ha: At least one panel is stationary				
	Bank Results		Country Results	
	Statistic	p-value	Statistic	p-value
Inverse chi-squared (202)	193.07	0.66	18.82	0.84
Inverse normal	3.86	1.00	1.40	0.92
Inverse logit t(424)	2.11	0.98	1.52	0.93
Modified inv. chi-squared	-0.44	0.67	-1.00	0.84

This finding, of course, does not invalidate the results presented throughout this study for the reason mentioned above as well as two other reasons. The second reason behind not adjusting for unit roots (meaning including lags in

the study) is that inclusion of lagged values makes little difference in the results. In comparing the linear results with Arellano-Bond results, the general findings hold in both direction and general magnitude. The third reason for not presenting dynamic, time-dependent results is that the dependent variable – banks' or countries' ratings – is in ordered probit or logit format. Essentially, ratings only take on a limited number of values, and these values are ordered. An ordered probit or logit model produces results with residuals of a lower magnitude than competing dynamic models, such as the Arellano-Bond estimates performed against the dataset. Additionally, certain fixed effect variables, such as whether the bank is an Islamic bank, is omitted in an Arellano-Bond regression.

Regarding the finance risk and interest rate risk, this will increase our exposure by the derivative instruments, the reason of financial crisis and the base for the bankruptcy of major companies across the globe. Specifically a derivative instrument in itself is exposed to a bunch of risks which include the interest rate risk and adds the risk of the change in the underlying instrument which drives the value of the derivative instrument. This makes the nature of banks and the instruments designed by them more complex and the stakeholders are exposed to a great extent of risk.

The failure of major international banks have triggered the central banks to stricken the risk assessment process of the commercial banks/financial institutes and specifically the financial derivative markets which are more complex in nature than a routine banking arrangement. Swap market is

considered to be the fastest growing segment of the derivative market where in MENA region it was reported to be 90% of the entire derivative market (Hakim and Neaime, 2005). The bank reliance on the derivative instruments and the exposure on off balance sheet items have increased the overall risk of the banks and makes it difficult to assess the volatility of their underlying cost drivers. At the same time, the deregulation and financial innovations including securitization and credit derivatives have made banking sector more concentrated, complex and more closely connected with capital markets. To overcome these issues, the central banks started focusing on risk assessment criteria to be unbiased and fair indicator of the bank's exposure to risk. This leads to the usage of rating agencies for an unbiased opinion on the risk an instrument or bank at large is exposed to.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

Credit rating is an independent opinion expressed by the professional bodies e.g. credit rating agencies that state about capacity of an entity to meet its obligations and is based on various quantitative and qualitative factors. These ratings therefore, represent the opinions of respective rating agencies and do not reflect the views of the Central bank. Besides, these rating agencies also do not represent investment advice or should be construed as such. The objective is to provide another yardstick to stakeholders for informed decision making, promote healthy competition and induce financial institutions to improve their state of financial affairs.

In this context, this study has examined the importance of bank level as well as country level attributes that affect the credit ratings of MENA countries and their commercial banks covering the period 2000 - 2012. Throughout the study, the empirical analysis is conducted using panel data and cross-country sample covering 13 MENA countries to estimate country's rating models, and by using a panel data and cross-country sample of commercial banks covering 108 banks to estimate bank's rating models. The empirical research has been conducted with regard to examining the following specific objectives:

- Undertake a critical review of extant methodologies and evidence on credit rating models, specifically as they apply to banks and sovereign countries.

- Conduct empirical analysis using panel data methodology for estimating bank and country credit rating models for MENA countries.

- Analyse the policy implications with regard to the risk-sharing incentives for MENA countries' banks through an informed analysis of the significant factors affecting their credit ratings.

For the purpose of testing the hypotheses and objectives of this research, it may be useful to note that Enrico Fermi, who obtained an Italian Nobel Prize for Physicist in 1938, argued that "*There are two possible outcomes: if the result confirms the hypothesis, then you have made a discovery. If the result is contrary to the hypothesis, then you have made a discovery*".

7.2 Main Conclusion of the Research

7.2.1 Summary of Country's Rating Results

Three empirical models (ordinary least square, random effect probit and random effect logit) have been employed to predict MENA country's ratings. Although the logit and probit models differ by a reasonable amount of odds ratio but still they are consistent towards the general outcome. Three different groupings of independent variables are employed in the process of estimating country's ratings.

According to the first group of regulatory and supervision variables, only three independent variables namely; capital requirements, restrictions on banking activities and internal management and organisational requirements are proved to be statistically significant but with an inverse relationship with the ratings. This indicates that too much regulation is a bad thing when it comes to estimate bond ratings.

The result of capital requirement is given the popular view it acts as a backstop when the financial system is under stress. The research findings suggest that higher likelihood for countries with less of a capital requirement burden to have higher (better) bond ratings. In terms of the restrictions on bank activities, the results show that countries who adopt too many restrictions might lead to lower bond ratings. Hence if countries impose higher capital requirements with more restrictions on bank activities, this may result in lower overall GDP and the possible influence that might occur on economic risk taking and its effect on broader economic growth, which might put downward pressure on bond ratings. Since the internal management and organisational requirements factor has not been investigated by previous research, the research result indicates that countries with less burdensome organisational requirements are by 5 to 1 odds more likely to receive a better rating, although is not beneficial to be considered for bond ratings.

The second group of macroeconomic variables provides interesting results with four of the variables statistically significant namely; real GDP growth, GDP, GDP per capita and investment as a percentage of GDP; they relatively

are in-line with a priori theory. Real GDP growth variable with an odds-ratio less than one, indicating that countries with slower GDP growth have 1.16 to 1 higher odds to receive a better bond rating. Real GDP growth does not show a positive relationship to the credit ratings, this could be due to the small country sample size. Generally speaking, emerging economies with weaker financial system may have issued lower bond ratings even though these countries may be growing much quicker than countries with stronger financial systems, this statement can be applied to some cases related to MENA countries.

Moreover, it has been pointed out through the results that the probit and logit models confirm that nations with higher total GDP generally get a hold of higher bond ratings. However, GDP per capita exhibits a very small positive effect and was also observed to be statistically significant. In addition, it should be noted that a country with a relatively high per capita GDP may have to be assigned with high sovereign ratings. According to the estimation of both models, investment as a percentage of GDP is statistically significant at the 98% level. This implies that countries with large investment activity are by a greater than 2 to 1 margin to be given a higher bond rating. This finding is expected based on the existing literature which demonstrates that the healthy long term outlook of any economy leads to positive sovereign ratings.

In general, the real GDP growth, total GDP, GDP per capita and investment as a percentage of GDP were observed to have a significant impact on sovereign ratings.

However, this study does not identified investment debt to GDP variable as a statistically significant in the determination of sovereign credit ratings at the same level of previous research, although this variable observed to have a positive correlation with the ratings. It is worth to mention that this finding does not lead to lower bond ratings and this may give researchers some pause to think. The reason for this may be that bond rating agencies do not necessarily frown upon government debt, but rather what governments are doing with their debts.

The last group of the world aggregate governance indicators has four statistically significant predictor variables to determine sovereign credit ratings. Within these variables, political stability and absence of violence/terrorism, government effectiveness and rule of law proved to have positive correlation territory with the ratings, while control of corruption is the only variable gives a negative relationship with the ratings.

With regard to the political stability factor, the probit and logit models produce a statistical significance of this variable at greater than 99%. The findings suggest that countries which obtain lack of political risk and high percentage of absence of the political instability and terrorism would maximize their chances to have better and higher bond ratings. For the government effectiveness indicator, both models signify very large estimates of the positive effect this variable has on a given country's rating. Again unsurprising finding given that strong quality of public services and high credibility of the policy government's commitment would lead to high sovereign ratings. The

rule of law shows significant level at 93% in the probit model and 91% in the logit model. This indicates when a country has confidence in, abides by the rules of society and applies high quality of contract enforcement as well as property rights; then it will face positive reflections that will lead to obtain higher sovereign ratings.

On the other hand, the logit and probit models confirm that control of corruption has a statistical significance level of greater than 99%. It also shows in contrast by the above three indicators that control of corruption generates such a strong negative influence on bond ratings. This points toward that a country which is exercising for high private gains and interests including grand forms of political corruption will end up to be rewarded lower sovereign ratings.

To conclude, political stability and absence of violence/terrorism, government effectiveness, rule of law and control of corruption were all observed to have a significant impact and considered to be important determinants of estimating sovereign ratings. The study also finds that improved macroeconomic conditions are correlated with higher ratings, while greater reserve regulations are correlated with lower ratings.

7.2.2 Summary of Bank's Rating Results

Similar to the previous section of country's ratings results, three empirical models (ordinary least square, random effect probit and random effect logit) have been employed to predict MENA bank's ratings. Four different groupings

of predictor variables are employed in the process of estimating bank's ratings.

The first group provides only six of the bank's characteristics and financial variables to be statistically significant. These are as follows; net interest margin, return on average assets, return on average equity, net loans to deposits, liquid assets to deposits and logarithm of total assets. The significant results are consistent by both models. The findings indicate that MENA banks which hold higher net interest margin are probably dealing with average and risky customers, and thereby are likely to receive lower ratings. However, this means banks should focus to make optimal decisions and rely more on wealthy customers in order for them to minimize the interest margin in a way that can be reflected positively to obtain high credit ratings.

Moreover, consistent results appear in term of the return on average assets and return on average equity, this implies that when banks have the efficiency to maximize shareholder's equity and the ability to convert their invested assets into generating more profit generally possess less risk and accomplish good ratings. In both cases, banks should recruit qualified and professional managers who are able to achieve high percentages of return out of their assets and equities. By doing this, banks would guarantee the high management performance leading to get hold of better and higher credit ratings.

The results of net loans to deposits and liquid assets to deposits provided a positive relationship that would be associated with the risk. Specifically, when banks have high ratio of net loans to customer deposits, it is likely to receive greater risk because banks may not have enough liquidity to cover any unforeseen fund requirements. Also, as a result of the high volume in risky loans that banks might have, this will lead them to maintain a high balance in the liquid assets in order to cover any potential losses from the banking activities. Therefore, in both cases for assessing a bank's liquidity, a high percentage of net loans and liquid assets to deposits would lead banks to receive lower credit ratings on their debts.

In terms of the logarithm of total assets that represents the bank's size, unsurprising findings concluded that banks with a hold of large assets and strong total market value of the securities indicate to have a good sign of credit safety; as a result these banks will be issued higher and better credit ratings.

To conclude, bank level accounting and financial characteristics played a key role having been observed to be important factors on the impact of estimating banks credit ratings.

The second group with regard to regulatory and supervision variables offer significant results to influence bank's credit ratings. Relatively, the logit and probit models show that six of these variables are statistically significant at greater than 99% level to influence credit ratings. According to the capital

requirements and deposit insurance scheme, both models produce adverse effects on banks ratings. In detail, it suggests that banks operating in countries that impose higher capital requirements and with explicit deposit insurance scheme are considered being riskier banks and negatively influencing the overall GDP and economic growth, which may result in receiving lower credit ratings.

The results show that banks in countries with higher restrictions on bank activities and official disciplinary power may lead to obtain higher credit ratings. This could be due to many reasons, first the fact that credit rating agencies are concerned about banks' ability to repay loans, and pleased to issue higher ratings to banks which operate under countries that apply more restrictions on banks activities, as this may make the banking industry to be safer. Second, rating agencies are also concerned about the application of business law and its enforcements. By regulating the nonconforming banks, this may reduce the risk involved and amplify the good chances in acquiring better credit ratings.

Furthermore, interesting results appear in terms of the liquidity and diversification requirements. The probit and logit models generate a negative effect on banks credit ratings. This indicates that rating agencies might be concerned about what banks are required to be involved in and that concern shows up in ratings. However, internal management and organisational requirements have a positive effect on banks credit ratings because this variable deals with reducing the risk involved. This means that banks in

countries which require high standards of internal and organisational management, it is more likely to obtain higher ratings. On the other hand, this is not the case for the government bond ratings, since this variable is viewed kindly by rating agencies, and it can deliver negative effect due to the unpleasant consequences it might have on the GDP and other economic cycle.

Moreover, in order to explain and estimate banks credit ratings, it is essential to incorporate country-level data including regulatory and supervision features. This is in line with the point of view for other researchers (e.g. Grunert, Norden and Weber, 2005; Ioannidis, Pasiouras and Zopounidis, 2010) who conducted different studies on the importance of using non-financial factors to explain credit ratings.

In connection with the third group of macroeconomic variables, only one variable (unemployment rate) provides significant impact on banks credit ratings. The probit and logit models show evidence of that unemployment rate is statistically significant at above 99% level, and it has a negative correlation with the credit ratings. The result indicates that when the percentage rate of unemployment is high and on the rise, the credit ratings of banks would be affected negatively to be low.

Regarding the last group of predictor variables that is world governance indicators, government effectiveness was the only variable to be included in the estimations, while other variables were excluded due to collinearity

problems. Despite the fact that this variable was not significant above 90%, the probit and logit models generate statistical significance estimates of 86%. Similar to the finding on official disciplinary power of the supervisory agency, the result indicates that when assessing bank's ratings, credit rating agencies should pay more attention to the government's actions towards banks.

Lastly, in terms of the dummy variable which has been used to whether a bank is an Islamic one or not, the result shows to be statistically insignificant using the 90% threshold, while the significance level for the probit model is 83% and 84% for the logit model. The result is consistent with the theory that Islamic banks may budget and do business in a more conservative manner than the conventional ones, and thus receive higher credit ratings.

7.2.3 Summary of Overall Results

This study empirically evaluates predictors of ratings given to countries and banks. The measures capture financial health, regulation environment, governance, and macroeconomic conditions. The results provide some interesting connections with economic theory.

7.2.3.1 Financial Ratios

The results on the financial health measures, which are included only in the bank ratings chapter (net interest margin, return on average assets, total assets, and other financial ratios are not relevant to government ratings).

The economic theory behind inclusion of these variables is that these financial ratios capture risk, financial capability, and other indications of the strength of a bank's balance sheet.

Of the 12 measures included, six were found to be statistically significant above the 99% level at predicting the ordered ranking of a given bank. The six measures are Net Interest Margin (fr1), Return on Average Assets (fr2), Return on Average Equity (fr3), Net Loans to the sum of Customer Deposits and Short-term Funding (fr10), Liquid Assets to the sum of Customer Deposits and Short-term Funding (fr11), and the Logarithm of Total Assets (fr12).

The probit result on Net Interest Margin indicates that as the Net Interest Margin increases, ratings generally decline. This implies that banks that lend at higher rates relative to the cost of acquiring funds have lower ratings. In relation to economic theory, this result is completely unsurprising. Banks that lend at higher margins generally are lending to individuals and businesses that are riskier to lend to, which is consistent with the theory of moral hazard. Essentially, only firms with riskier propositions or ability to repay would take out higher interest loans, and banks that lend to such individuals and businesses generally have higher risk.

The second statistically significant result is the Return on Average Assets; the result indicates that as Return on Average Assets increases, ratings generally increase. This result stems from the risk-average nature of ratings agencies. Ratings agencies are looking for evidence of well-run banks. The ability of a

bank to achieve higher returns on their assets indicates a less risky nature of the assets held by the bank.

The third statistically significant result is Return on Average Equity (fr3). The results indicate that as the Return on Average Equity increases, the rating generally declines. This result seems completely consistent two tenants of economic theory. The first is the theory of adverse selection. Adverse selection simply implies (and as a note, this could also apply to the first result on Net Interest Margin) that individuals and banks with higher rates are riskier, meaning banks dealing in such loans have an adverse selection problem. The second economic theory explaining the statistically significant results here is a fundamental theory in finance related to risk and reward. Essentially, the higher the risk, the higher the expected return has to be for investors (or in this case banks) to take on the risk. Banks with higher Return on Average Equity get lower ratings because they are dealing in riskier loans, and, as theorised in the financial literature, with higher risk comes higher expected returns (thus, the higher Return on Average Equity with lower overall ratings).

The difference between the result on Return on Average Assets (negatively related to ratings) and the result on Return on Average Equity (positive result related to ratings) probably stems from the core difference between what an asset is and what equity is. Equity is a liability in accounting, while an Asset is strength. When banks have a higher equity outstanding, this means a greater portion of their operations are funded by equity, a riskier form of financing.

The fourth statistically significant result is Net Loans to the sum of Customer Deposits and Short-term Funding. The results indicate that as Net Loans to the sum of Customer Deposits and Short-term Funding increases, so do ratings. This result stems from the nature of the banking business. Banks with a larger loans portfolio in relation to customer deposits and short-term funding likely indicates the ability of banking managers to use their assets to increase business. This is consistent with the economic theory of Signalling. Signalling simply implies that banks, just as job seekers do when looking for a job, signal their strengths. In this case, ratings agencies incorporate such signals into banks' ratings.

The fifth statistically significant financial ratio result is Liquid Assets to the sum of Customer Deposits and Short-term Funding. The results indicate that as liquid assets increase relative to customer deposits and short-term funding, ratings generally decline. This finding is consistent with signalling as well, except that in this case, banks are signalling the wrong information to ratings agencies. Essentially, when banks keep a larger portion of their assets in a liquid form, which is forgoing higher returns by investing the money somewhere else, this signals to ratings agencies that there is some reason the given bank has to keep a higher percentage of its deposits in liquid assets. Thus, the signal gets incorporated into banks' ratings.

The sixth significant financial variable is the Logarithm of Total Assets. The results indicate that as the total assets increase, so do ratings. Two economic theories likely explain this phenomenon. The first is the theory of scale.

Essentially, as the amount of assets under management increases, banks are likely able to become more efficient and scale their operations. Efficient operations are generally thought to be less risky, and thus, ratings agencies reward efficient banks with better ratings. In addition to the theory of scale, the second theory is that of asymmetric information. Larger banks likely have the resources to exploit the asymmetric information between themselves and ratings agencies. This asymmetric information is exploited when ratings agencies assign ratings to banks.

7.2.3.2 Regulatory Variables

The study includes nine regulatory variables, of which two are statistically significant for countries and six are statistically significant for banks. A discussion of the two (Capital Requirements, rs1 and Restrictions on Bank Activities, rs3) statistically significant results for countries is first, followed by a discussion of the six statistically significant predictors of banks' ratings.

The findings indicate that as Capital Requirements increase, ratings generally go down. The economic theory that might explain this result is signalling among countries. Essentially, countries that have to impose higher capital requirements are signalling to ratings agencies that they are riskier for the country as a whole. This signal is incorporated into ratings agencies' decisions. Results of the second regulatory variable for governments indicate that as restrictions on banks activities increase, ratings decline. In addition to being consistent with the economic literature on signalling, this result is also consistent with the moral hazard literature. Moral hazard is present whenever

someone or some government takes on more risk whenever someone else bears a higher percentage of the burden associated with the risk. In this case, countries that place greater restrictions on banks activities are signalling their need to deal with moral hazard problems, and unsurprisingly, ratings agencies incorporate this behaviour into their ratings.

However, the six significant results for regulatory variables for banks are Capital Requirements (rs1), Deposit Insurance Scheme (rs2), Restrictions on Banks Activities (rs3), Official Disciplinary Power of the Supervisory Agency (rs7), Liquidity and Diversification Requirements (rs8), and Internal Management and Organisational Requirements (rs9).

First, the results indicate that Capital Requirements increase, a banks' rating generally declines. This result is consistent with the result on countries. The theory behind this observed result is likely the same as explained for governments. Essentially, countries are signalling to ratings agencies that their banks are riskier when governments impose greater capital requirements, and this signalling is incorporated into ratings agencies' decisions.

Deposit Insurance Schemes (rs2) results indicate that this variable becomes more prevalent when ratings decline. Signalling likely explains this result.

In terms of the Restrictions on Banks Activities, the results indicate that as this variable increases, so do ratings. This result likely stems from the risk-averse

nature of assigning ratings. When governments place regulations on what banks can do, ratings agencies apparently view this not as a signal of problem banks, but rather as an indication that banks are safer than they otherwise would be. This less risky component of bank activities therefore pushes ratings up.

For the fourth variable, the result indicates that as Supervisory Agencies of governments get more teeth, or in other words the ability to punish, banks receive higher ratings. This likely stems from the economic theory of signalling as well as the theory behind asymmetric information. The theory of asymmetric information simply implies that ratings agencies, which lack complete information compared to the individuals responsible for the day-to-day activities of the banks, view government supervisory agencies as a way to lower the risk associated with asymmetric information.

A result of the fifth variable indicates that as Liquidity and Diversification Requirements increase, ratings generally decline. This result is also consistent with signalling, where governments are signalling to ratings agencies that their banks are riskier than banks in other places of the globe.

The sixth statistically significant variable is Internal Management and Organisational Requirements (rs9). Finding of the sixth one indicates that as Internal Management and Organisational Requirements increase, ratings are generally better. The result stems from signalling as well as asymmetric information. As mentioned in other parts of this write-up, ratings agencies are

often concerned about asymmetric information. When governments require certain organisational structures, apparently ratings agencies view this as less risky, probably because of the reduced risk associated with asymmetric information. Why asymmetric information? Because requirements on internal management and organisational requirements require information in the hands or more individuals, which lessens the risk associated with asymmetric information in the hands of too few individuals.

Overall, these fascinating results are likely stemmed from asymmetric information, where government balance sheets are generally much more open than are the activities of private banks. Regulatory variables lower or increase the risk associated with private banks.

7.2.3.3 Macroeconomic Variables

Of the nine variables, only one is statistically significant above the 95% level for the banks ratings regression, while country ratings model results include four statistically significant variables.

Addressing first the bank ratings results, the sole variable with statistical significance is the unemployment rate. The results indicate that as the unemployment rate rises, bond ratings generally decline. The result is unsurprising in light of economic theory suggesting that higher unemployment correlates with increased risk of default, something that ratings agencies apparently consider in their assessment of a country's worthiness to issue debt. The result is also consistent with theory on asymmetric information, in

that there is increased asymmetric information in times of greater uncertainty, such as when a country has a higher than average unemployment rate.

Shifting to the results on government ratings, the results indicate that as Real GDP Growth increases, ratings are generally lower. In business theory, this probably makes little sense. Why would a country with better growth experience be punished by lower ratings from the ratings agencies? The answer lies in economic theory. Countries with higher Real GPD Growth are likely the countries with increased risk of experiencing a sharp downturn in economic growth. This economic conditions-induced information asymmetry is likely accompanied by moral hazard, where countries with higher economic growth have a higher likelihood to take on debt with mispriced risk of default. The bond ratings agencies are, obviously, well aware of this and account for the economic theories in their ratings.

The second statistically significant variable is GDP in US dollars, this indicates a size effect. As GDP becomes larger, bond ratings generally are pushed up somewhat, although the 0.01 or 1.01 are very small effects. The results are consistent with the economic theory of scale, meaning there is reduced risk to bond market investors when a country's GDP becomes ever larger, with the country possessing the ability to repay the debt as well as the likelihood that the country is more open about its finances. Both explanations have their roots in signalling, moral hazard, and asymmetric information.

For the GDP per Capita, the results are quite close to indifference in the direction, although there is a small positive effect. The direction is consistent

with economic theory, in that the wealthier a country, as measured by GDP per capita, the lower the risk is of default.

For the fourth variable, the results indicate that as Investment as a Percentage of GDP increases, bond ratings generally increase as well. This means that investors pay a good deal of attention to investment, a key determinant of long-term economic growth.

Overall, these results suggest that ratings agencies really do consider the behavioural incentives associated with asymmetric information, adverse selection, moral hazard, and signalling, which are more present when discussing financial ratios and regulatory environments than with the macroeconomics that drive government ratings.

7.2.3.4 Governance Variables

None of the six governance variables were statistically significant in predicting ratings, with only one included in the final regression due to multicollinearity. This suggests that ratings agencies pay much more attention to hard and fast measures such as GDP growth regulatory environments than they do about perception variables, such as the rule of law and control of corruption.

Lastly, an interestingly in comparison to the results on banks ratings, the results on the government ratings indicate that four of the six governance variables are statistically significant. The four are Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Rule of Law, and

Control of Corruption. The result of Political Stability and Absence of Violence/Terrorism indicating that there is a strong effect of political stability on government bond ratings. This result indicates that ratings agencies consider the probability of a government being overthrown in their assessment of default risk. The result is consistent with the effects asymmetric information have on bond ratings, in this case asymmetric information in the form of government stability.

For the Government Effectiveness, the large magnitude results indicate, as with political stability, that government's ability to control conditions affects its bond rating.

For the Rule of Law, as with Government Effectiveness, the results indicate that ratings agencies consider a government's word in keeping bondholder covenants, as with the Rule of Law.

With regards to the Control of Corruption, the results provide that this indicator makes the risk of default lower. In contrast, the results indicate that as control of corruption increases, bond ratings generally decline. This result may stem from the economic theory of signalling. Essentially, governments that spend significant amounts of money on controlling corruption are likely sending the signal that corruption is a problem, and this signal is incorporated into bond ratings.

7.3 Practical Implications and Policy Recommendations

7.3.1 Quality Use of Credit Ratings

One of the significant problems that credit ratings agencies have to be aware of is asymmetric information. Because of this, credit rating agencies are considered as an intermediary between the issuer and investor to minimise the possibility of asymmetric risk information. In many cases, rated objects do not supply truthful information to credit ratings agencies because they always will be looking for having higher ratings. To avoid such asymmetric information, the pivotal responsibility of rating agencies is to assign professional experts who can deal with quantitative methods when collecting the relevant information of the rated objects. By doing so, this will be evident in guaranteeing high percentage of accuracy and objectivity of supplied information towards the financial institutions like banks as well as countries.

However, Somerville and Taffer (1995) pointed out that credit rating experts tend to be pessimistic about any enterprise situation because of the possibility in facing risk and also because credit rating systems contain their personal details. As a result, Somerville and Taffer (1995) indicated that credit rating agencies do not rely frequently on those experts and they shifted their intentions for more objective methods such as quantitative method.

Developing and applying methodologies to predict the performance of financial products and underlying assets are involved in credit ratings activities. For conducting specific ratings, credit agencies should always use historical data that based on the economic theories as well as empirical

analysis. An early study by Altman and Saunders (1997) argued that the accuracy of credit ratings is not perfect by any means. In terms of the variance appearance in each ratings, they concluded that there is no doubt that the higher variance is, the lower accuracy rating will be.

Many more implications should be considered to enhance the quality of predicting credit ratings. Specifically credit ratings agencies should have a synchronous ranking standard for each object such as banks, companies or countries. These objects should be ranked separately because of the different economic conditions and characteristics. In addition, competition among credit ratings agencies is a key factor to improve the development and quality of the ratings industry. This is based on the fact that since all the agencies involved are desired to be highly appreciated and thus, have more customers and good reputation.

Furthermore, Wilson (1994) and Ederington *et al.* (1987) share their opinions regarding the use of credit ratings. They commented that the issuers have the right to appeal against the issued ratings by the credit agencies in case it is not satisfied in their perspectives, but generally the authors are also confirmed that these ratings are granted to reflect the real picture of the issuers itself. In another example, Bruskin (1994) argued that financial markets tend to trust the rating agencies in the decision of credit support requirements.

Moreover, some researchers argue that policy makers should withdraw the financial regulation from the use of ratings whereas others have contrary

opinion. The US Treasury (2009) planned to mitigate the dependence on credit rating agencies of investors and regulators. Nevertheless, Matthew and White (2009) were inclined to think that one policy option makes financial institutions have the chance to choose the most reliable sources to take advice. Contrary to above opinion, the Turner Review (2009) ascertained that there are a lot of factors other than regulation may remarkably affect the use of credit ratings.

7.3.2 Risk Sharing Incentives for MENA Banks

In this part, a discussion of the cover of the risk sharing incentives which MENA banks enjoy is important. As we know different investors have different risk attitudes. Some are risk averse, who continue to follow a conventional track by getting lesser return with lesser associated risk, whereas some are risk seekers who enjoy higher returns by taking higher associated risk. Family owned banks have incentives to take less risk whereas state owned banks have higher non-performing loans displaying higher risk. By comparing conventional and Islamic banks, the findings suggest that the Islamic banks are as stable as conventional banks, the only difference that is created which distinguishes the two are the associated risk. Generally, conventional banks are more risk seeking in nature than Islamic banks.

In MENA countries, the growth of Islamic banking has been impressive. According to Ali (2011), the financing activities of Islamic banks are more tied to economical activities than their counterparts. Islamic banks avoid direct exposure to more exotic financial derivatives and keep their most of the

investments in liquid form as compared to conventional banks. This makes them more stable.

As the global financial crisis became a global economic crisis, some banks in the UAE (Dubai) and Qatar were affected due to their asset concentration in the real estate sector and because they have invested in the previous growing equity markets that are facing higher risks and showing higher volatility in the second round of crisis (Gamaginta and Rokhim, 2011; Ali, 2011). The 2007 crisis led to an increased awareness of the importance of the development of the financial institutions and the markets. It has been shown that when banking systems grow too quickly, crises are likely to follow (Demirguc-Kunt and Detragiache and Levine, 2008).

Banking sectors in the MENA region have many similarities, but are also quite different from each other. Within the region there are also large differences among countries, in terms of size, per capita GDP and financial development. Egypt, Jordan, Morocco and Tunisia are classified by the World Bank as lower middle income countries, Lebanon as a middle income country (Naceur, Ben-Khedhiri and Casu, 2011). Despite similarities in the process of financial reforms undertaken by the MENA countries, the efficiency level of the bank varies. For improvement, banking sector policies should be aimed to improve risk management, portfolio management and maintaining a sufficient level of capitalization.

7.4 Suggestions for Future Research

In the light of the above discussion and having investigated the estimation of credit rating models for MENA countries and their commercial banks using a wide range of financial and non financial variables, there are some issues that need to be addressed or suggested as important factors to be considered in future research.

Firstly, although the accuracy of ratings is predicting default is not addressed in the current study, it is certainly possible that future studies could address accuracy by including default amounts for banks and countries in the empirical data sets.

Secondly, it can be said that there is no optimal method or model that is in accordance with the international standards and can be applied in estimating credit ratings, therefore, credit agencies or analysts should determine specific rating criteria, and building models should be consistent with and based on characteristics of the economy of each country.

Moreover, the current study contains no evaluation of the differences in ratings among the various credit ratings agencies. However, previous literature has already discerned variations across these agencies, e.g. Cantor and Packer (1997) or Shin and Moore (2003). Still, in connection with the constructed data in this thesis, future research on the topic could address the differences in credit ratings agencies' ratings between governments and

banks' ratings. Such a study might address various types of biases among ratings agencies.

Thirdly, the importance of banks' environment for their credit ratings is stressed by the rating agencies and has also been confirmed in previous studies. That is why an inclusion of more country level data indicators will prove to be valuable in further studies. For example, better access to sources might assemble more important determinant of credit ratings to be included such as corporate governance similar to Ashbaugh-Skaife, Collins and LaFond (2006). Additionally, consideration might be given to the market structure, covering e.g. government and foreign ownership of banks, similar to Pasiouras, Gaganis and Zopounidis (2006). However, other qualitative variables in the fields of human resources, strategic and marketing should be researched further and considered in the process of estimating sovereign and banks credit ratings, as it might have a significant influence on the credit ratings industry.

Fourthly, the current study sets out to deduce implications from empirical evidence about bank risk. Banks that have adequate capital strength are in a strong financial position to weather adverse situations and are less prone to risk. Moreover, in order for authorities to control the risk of banks and to stabilise the banking system, they may employ a range of devices. Auditing and accounting requirements have been shown as effective in reducing risk, serving as substitutes for restrictions on bank activities and official discipline. The combined use of auditing, accounting and capital requirements can

counteract risk-taking incentives of banks. Overall, a multitude of diverse, often interrelated, factors in the regulatory and supervisory environment have been identified as influential for counteracting bank risk and improving credit rating. In many cases, previous literature has brought about mixed evidence. More research will be required to gain further insight into bank risk and risk-taking incentives from which policy implications may be deduced.

APPENDICES

Appendix (5 – A): Standard & Poor's Long-Term Issuer Ratings and Linear Transformation Scale for MENA Countries

Country	Year	S&P's Ratings	Linear Transformation Scale
Bahrain	2000	N/A	N/A
Bahrain	2001	N/A	N/A
Bahrain	2002	A-	15
Bahrain	2003	A-	15
Bahrain	2004	A-	15
Bahrain	2005	A-	15
Bahrain	2006	A	16
Bahrain	2007	A	16
Bahrain	2008	A	16
Bahrain	2009	A	16
Bahrain	2010	A	16
Bahrain	2011	BBB	13
Bahrain	2012	BBB	13
Egypt	2000	BBB-	12
Egypt	2001	BBB-	12
Egypt	2002	BB+	11
Egypt	2003	BB+	11
Egypt	2004	BB+	11
Egypt	2005	BB+	11
Egypt	2006	BB+	11
Egypt	2007	BB+	11
Egypt	2008	BB+	11
Egypt	2009	BB+	11
Egypt	2010	BB+	11
Egypt	2011	B+	8
Egypt	2012	B-	6
Israel	2000	A-	15
Israel	2001	A-	15
Israel	2002	A-	15
Israel	2003	A-	15
Israel	2004	A-	15
Israel	2005	A-	15

Israel	2006	A-	15
Israel	2007	A	16
Israel	2008	A	16
Israel	2009	A	16
Israel	2010	A	16
Israel	2011	A+	17
Israel	2012	A+	17
Jordan	2000	BB-	9
Jordan	2001	BB-	9
Jordan	2002	BB-	9
Jordan	2003	BB	10
Jordan	2004	BB	10
Jordan	2005	BB	10
Jordan	2006	BB	10
Jordan	2007	BB	10
Jordan	2008	BB	10
Jordan	2009	BB	10
Jordan	2010	BB	10
Jordan	2011	BB	10
Jordan	2012	BB	10
Kuwait	2000	A	16
Kuwait	2001	A	16
Kuwait	2002	A+	17
Kuwait	2003	A+	17
Kuwait	2004	A+	17
Kuwait	2005	A+	17
Kuwait	2006	A+	17
Kuwait	2007	AA-	18
Kuwait	2008	AA-	18
Kuwait	2009	AA-	18
Kuwait	2010	AA-	18
Kuwait	2011	AA	19
Kuwait	2012	AA	19
Lebanon	2000	B+	8
Lebanon	2001	B	7
Lebanon	2002	B-	6
Lebanon	2003	B-	6
Lebanon	2004	B-	6
Lebanon	2005	B-	6
Lebanon	2006	B-	6
Lebanon	2007	B-	6
Lebanon	2008	B-	6
Lebanon	2009	B	7
Lebanon	2010	B	7
Lebanon	2011	B	7
Lebanon	2012	B	7
Morocco	2000	BB	10
Morocco	2001	BB	10

Morocco	2002	BB	10
Morocco	2003	BB	10
Morocco	2004	BB	10
Morocco	2005	BB+	11
Morocco	2006	BB+	11
Morocco	2007	BB+	11
Morocco	2008	BB+	11
Morocco	2009	BB+	11
Morocco	2010	BBB-	12
Morocco	2011	BBB-	12
Morocco	2012	BBB-	12
Oman	2000	BBB-	12
Oman	2001	BBB	13
Oman	2002	BBB	13
Oman	2003	BBB	13
Oman	2004	BBB+	14
Oman	2005	BBB+	14
Oman	2006	A-	15
Oman	2007	A	16
Oman	2008	A	16
Oman	2009	A	16
Oman	2010	A	16
Oman	2011	A	16
Oman	2012	A	16
Pakistan	2000	B-	6
Pakistan	2001	B-	6
Pakistan	2002	B	7
Pakistan	2003	B	7
Pakistan	2004	B+	8
Pakistan	2005	B+	8
Pakistan	2006	B+	8
Pakistan	2007	B+	8
Pakistan	2008	CCC+	5
Pakistan	2009	B-	6
Pakistan	2010	B-	6
Pakistan	2011	B-	6
Pakistan	2012	B-	6
Qatar	2000	BBB	13
Qatar	2001	BBB+	14
Qatar	2002	A-	15
Qatar	2003	A+	17
Qatar	2004	A+	17
Qatar	2005	A+	17
Qatar	2006	A+	17
Qatar	2007	AA-	18
Qatar	2008	AA-	18
Qatar	2009	AA-	18
Qatar	2010	AA	19

Qatar	2011	AA	19
Qatar	2012	AA	19
Saudi Arabia	2000	N/A	N/A
Saudi Arabia	2001	N/A	N/A
Saudi Arabia	2002	N/A	N/A
Saudi Arabia	2003	A	16
Saudi Arabia	2004	A	16
Saudi Arabia	2005	A	16
Saudi Arabia	2006	A+	17
Saudi Arabia	2007	AA-	18
Saudi Arabia	2008	AA-	18
Saudi Arabia	2009	AA-	18
Saudi Arabia	2010	AA-	18
Saudi Arabia	2011	AA-	18
Saudi Arabia	2012	AA-	18
Tunisia	2000	BBB	13
Tunisia	2001	BBB	13
Tunisia	2002	BBB	13
Tunisia	2003	BBB	13
Tunisia	2004	BBB	13
Tunisia	2005	BBB	13
Tunisia	2006	BBB	13
Tunisia	2007	BBB	13
Tunisia	2008	BBB	13
Tunisia	2009	BBB	13
Tunisia	2010	BBB	13
Tunisia	2011	BBB-	12
Tunisia	2012	BB	10
Turkey	2000	B+	8
Turkey	2001	B-	6
Turkey	2002	B-	6
Turkey	2003	B+	8
Turkey	2004	BB-	9
Turkey	2005	BB-	9
Turkey	2006	BB-	9
Turkey	2007	BB-	9
Turkey	2008	BB-	9
Turkey	2009	BB-	9
Turkey	2010	BB	10
Turkey	2011	BB	10
Turkey	2012	BB	10

Appendix (5 –B): Transformation and Numerical Score for Capital Requirements for MENA Countries

Country	Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Score
		Capital Requirements							
Bahrain	2000	No	No	No	Yes	Yes	No	No	No	2
Bahrain	2001	No	No	No	Yes	Yes	No	No	No	2
Bahrain	2002	No	No	No	Yes	Yes	No	No	No	2
Bahrain	2003	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5
Bahrain	2004	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5
Bahrain	2005	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5
Bahrain	2006	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5
Bahrain	2007	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Bahrain	2008	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Bahrain	2009	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Bahrain	2010	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Bahrain	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2000	Yes	No	No	Yes	Yes	No	No	Yes	4
Egypt	2001	Yes	No	No	Yes	Yes	No	No	Yes	4
Egypt	2002	Yes	No	No	Yes	Yes	No	No	Yes	4
Egypt	2003	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2004	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2005	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2006	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2007	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2008	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2009	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2010	Yes	No	No	Yes/No	Yes	No	No	No	3
Egypt	2011	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	7
Egypt	2012	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	7
Israel	2000	Yes	No	Yes	Yes	N/A	No	Yes	No	4
Israel	2001	Yes	No	Yes	Yes	N/A	No	Yes	No	4
Israel	2002	Yes	No	Yes	Yes	N/A	No	Yes	No	4
Israel	2003	Yes	Yes	Yes	Yes/No	N/A	No	Yes	No	5
Israel	2004	Yes	Yes	Yes	Yes/No	N/A	No	Yes	No	5
Israel	2005	Yes	Yes	Yes	Yes/No	N/A	No	Yes	No	5
Israel	2006	Yes	Yes	Yes	Yes/No	N/A	No	Yes	No	5
Israel	2007	Yes	Yes	Yes	Yes/No	Yes	No	Yes	No	6
Israel	2008	Yes	Yes	Yes	Yes/No	Yes	No	Yes	No	6
Israel	2009	Yes	Yes	Yes	Yes/No	Yes	No	Yes	No	6
Israel	2010	Yes	Yes	Yes	Yes/No	Yes	No	Yes	No	6
Israel	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Israel	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Jordan	2000	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Jordan	2001	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Jordan	2002	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Jordan	2003	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Jordan	2004	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Jordan	2005	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Jordan	2006	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Jordan	2007	Yes	No	No	Yes	Yes	No	Yes	Yes	5
Jordan	2008	Yes	No	No	Yes	Yes	No	Yes	Yes	5
Jordan	2009	Yes	No	No	Yes	Yes	No	Yes	Yes	5
Jordan	2010	Yes	No	No	Yes	Yes	No	Yes	Yes	5
Jordan	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2000	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Kuwait	2001	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Kuwait	2002	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Kuwait	2003	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Kuwait	2004	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Kuwait	2005	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Kuwait	2006	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Kuwait	2007	Yes	No	Yes	Yes/No	Yes	Yes	Yes	Yes	7
Kuwait	2008	Yes	No	Yes	Yes/No	Yes	Yes	Yes	Yes	7
Kuwait	2009	Yes	No	Yes	Yes/No	Yes	Yes	Yes	Yes	7
Kuwait	2010	Yes	No	Yes	Yes/No	Yes	Yes	Yes	Yes	7
Kuwait	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2000	Yes	No	No	Yes	N/A	Yes	Yes	Yes	5
Lebanon	2001	Yes	No	No	Yes	N/A	Yes	Yes	Yes	5
Lebanon	2002	Yes	No	No	Yes	N/A	Yes	Yes	Yes	5
Lebanon	2003	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2004	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2005	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2006	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2007	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2008	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2009	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2010	Yes	No	No	Yes/No	N/A	Yes	Yes	Yes	5
Lebanon	2011	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	7
Lebanon	2012	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	7
Morocco	2000	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Morocco	2001	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Morocco	2002	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Morocco	2003	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Morocco	2004	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Morocco	2005	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Morocco	2006	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Morocco	2007	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5
Morocco	2008	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5

Morocco	2009	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5
Morocco	2010	Yes	No	No	Yes/No	Yes	No	Yes	Yes	5
Morocco	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2000	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Oman	2001	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Oman	2002	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Oman	2003	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Oman	2004	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Oman	2005	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Oman	2006	Yes	No	No	Yes	Yes	Yes	Yes	Yes	6
Oman	2007	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Oman	2008	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Oman	2009	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Oman	2010	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Oman	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2003	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Pakistan	2004	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Pakistan	2005	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Pakistan	2006	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Pakistan	2007	Yes	Yes	Yes	Yes/No	Yes	Yes	Yes	Yes	8
Pakistan	2008	Yes	Yes	Yes	Yes/No	Yes	Yes	Yes	Yes	8
Pakistan	2009	Yes	Yes	Yes	Yes/No	Yes	Yes	Yes	Yes	8
Pakistan	2010	Yes	Yes	Yes	Yes/No	Yes	Yes	Yes	Yes	8
Pakistan	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2003	Yes	No	No	Yes/No	N/A	No	No	No	2
Qatar	2004	Yes	No	No	Yes/No	N/A	No	No	No	2
Qatar	2005	Yes	No	No	Yes/No	N/A	No	No	No	2
Qatar	2006	Yes	No	No	Yes/No	N/A	No	No	No	2
Qatar	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2000	Yes	Yes	Yes	Yes	No	No	No	Yes	5
Saudi Arabia	2001	Yes	Yes	Yes	Yes	No	No	No	Yes	5
Saudi Arabia	2002	Yes	Yes	Yes	Yes	No	No	No	Yes	5
Saudi Arabia	2003	Yes	No	No	Yes/No	No	No	Yes	Yes	4
Saudi Arabia	2004	Yes	No	No	Yes/No	No	No	Yes	Yes	4

Saudi Arabia	2005	Yes	No	No	Yes/No	No	No	Yes	Yes	4
Saudi Arabia	2006	Yes	No	No	Yes/No	No	No	Yes	Yes	4
Saudi Arabia	2007	Yes	No	No	Yes	Yes	No	Yes	Yes	5
Saudi Arabia	2008	Yes	No	No	Yes	No	No	Yes	Yes	4
Saudi Arabia	2009	Yes	No	No	Yes	No	No	Yes	Yes	4
Saudi Arabia	2010	Yes	No	No	Yes	No	No	Yes	Yes	4
Saudi Arabia	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2003	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Tunisia	2004	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Tunisia	2005	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Tunisia	2006	Yes	No	No	Yes/No	Yes	Yes	Yes	Yes	6
Tunisia	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2011	Yes	Yes	No	Yes	Yes	N/A	N/A	N/A	4
Tunisia	2012	Yes	Yes	No	Yes	Yes	N/A	N/A	N/A	4
Turkey	2000	Yes	Yes	Yes	Yes	No	No	No	No	4
Turkey	2001	Yes	Yes	Yes	Yes	No	No	No	No	4
Turkey	2002	Yes	Yes	Yes	Yes	No	No	No	No	4
Turkey	2003	Yes	Yes	Yes	Yes/No	No	No	No	No	4
Turkey	2004	Yes	Yes	Yes	Yes/No	No	No	No	No	4
Turkey	2005	Yes	Yes	Yes	Yes/No	No	No	No	No	4
Turkey	2006	Yes	Yes	Yes	Yes/No	No	No	No	No	4
Turkey	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Appendix (5 –C): Transformation and Numerical Score for Deposit Insurance Scheme for MENA Countries

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Bahrain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	1	1	1	1	1	1	1	1	1	1	1	1	1
Egypt	No	No	No	No	No	No	No	No	No	No	No	No	No
	0	0	0	0	0	0	0	0	0	0	0	0	0
Israel	No	No	No	No	No	No	No	No	No	No	No	No	No
	0	0	0	0	0	0	0	0	0	0	0	0	0
Jordan	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	0	0	0	1	1	1	1	1	1	1	1	1	1
Kuwait	No	No	No	No	No	No	No	No	No	No	No	N/A	N/A
	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
Lebanon	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	1	1	1	1	1	1	1	1	1	1	1	1	1
Morocco	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	1	1	1	1	1	1	1	1	1	1	1	1	1
Oman	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	1	1	1	1	1	1	1	1	1	1	1	1	1
Pakistan	N/A	N/A	N/A	No	No	No	No	No	No	No	No	No	No
	N/A	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Qatar	No	No	No	No	No	No	No	N/A	N/A	N/A	N/A	No	No
	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A	0	0
Saudi Arabia	No	No	No	No	No	No	No	No	No	No	No	N/A	N/A
	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
Tunisia	N/A	N/A	N/A	No	No	No	No	N/A	N/A	N/A	N/A	Yes	Yes
	N/A	N/A	N/A	0	0	0	0	N/A	N/A	N/A	N/A	1	1
Turkey	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	Yes	Yes
	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	1	1

Appendix (5 –D): Transformation and Numerical Score for Restrictions on Banks Activities for MENA Countries

Country	Year	Restrictions on Banks Activities			Q1	Q2	Q3	Average Score	Rounded Up
		Q1	Q2	Q3					
Bahrain	2000	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2001	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2002	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2003	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2004	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2005	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2006	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2007	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2008	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2009	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2010	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Bahrain	2011	unrestricted	prohibited	unrestricted	1	4	1	2	2
Bahrain	2012	unrestricted	prohibited	unrestricted	1	4	1	2	2
Egypt	2000	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Egypt	2001	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Egypt	2002	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Egypt	2003	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2004	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2005	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2006	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2007	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2008	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2009	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2010	permitted	permitted	restricted	2	2	3	2.33333333	2
Egypt	2011	permitted	restricted	restricted	2	3	3	2.66666667	3
Egypt	2012	permitted	restricted	restricted	2	3	3	2.66666667	3
Israel	2000	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Israel	2001	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Israel	2002	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Israel	2003	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Israel	2004	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Israel	2005	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Israel	2006	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Israel	2007	permitted	restricted	prohibited	2	3	4	3	3
Israel	2008	permitted	restricted	prohibited	2	3	4	3	3
Israel	2009	permitted	restricted	prohibited	2	3	4	3	3
Israel	2010	permitted	restricted	prohibited	2	3	4	3	3
Israel	2011	restricted	restricted	prohibited	3	3	4	3.33333333	3
Israel	2012	restricted	restricted	prohibited	3	3	4	3.33333333	3
Jordan	2000	unrestricted	prohibited	restricted	1	4	3	2.66666667	3

Jordan	2001	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Jordan	2002	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Jordan	2003	unrestricted	permitted	restricted	1	2	3	2	2
Jordan	2004	unrestricted	permitted	restricted	1	2	3	2	2
Jordan	2005	unrestricted	permitted	restricted	1	2	3	2	2
Jordan	2006	unrestricted	permitted	restricted	1	2	3	2	2
Jordan	2007	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Jordan	2008	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Jordan	2009	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Jordan	2010	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Jordan	2011	restricted	restricted	prohibited	3	3	4	3.33333333	3
Jordan	2012	restricted	restricted	prohibited	3	3	4	3.33333333	3
Kuwait	2000	unrestricted	permitted	prohibited	1	2	4	2.33333333	2
Kuwait	2001	unrestricted	permitted	prohibited	1	2	4	2.33333333	2
Kuwait	2002	unrestricted	permitted	prohibited	1	2	4	2.33333333	2
Kuwait	2003	unrestricted	permitted	permitted	1	2	2	1.66666667	2
Kuwait	2004	unrestricted	permitted	permitted	1	2	2	1.66666667	2
Kuwait	2005	unrestricted	permitted	permitted	1	2	2	1.66666667	2
Kuwait	2006	unrestricted	permitted	permitted	1	2	2	1.66666667	2
Kuwait	2007	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Kuwait	2008	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Kuwait	2009	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Kuwait	2010	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Kuwait	2011	unrestricted	permitted	unrestricted	1	2	1	1.33333333	1
Kuwait	2012	unrestricted	permitted	unrestricted	1	2	1	1.33333333	1
Lebanon	2000	unrestricted	prohibited	prohibited	1	4	4	3	3
Lebanon	2001	unrestricted	prohibited	prohibited	1	4	4	3	3
Lebanon	2002	unrestricted	prohibited	prohibited	1	4	4	3	3
Lebanon	2003	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Lebanon	2004	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Lebanon	2005	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Lebanon	2006	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Lebanon	2007	unrestricted	prohibited	prohibited	1	4	4	3	3
Lebanon	2008	unrestricted	prohibited	prohibited	1	4	4	3	3
Lebanon	2009	unrestricted	prohibited	prohibited	1	4	4	3	3
Lebanon	2010	unrestricted	prohibited	prohibited	1	4	4	3	3
Lebanon	2011	unrestricted	permitted	prohibited	1	2	4	2.33333333	2
Lebanon	2012	unrestricted	permitted	prohibited	1	2	4	2.33333333	2
Morocco	2000	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Morocco	2001	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Morocco	2002	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Morocco	2003	permitted	permitted	restricted	2	2	3	2.33333333	2
Morocco	2004	permitted	permitted	restricted	2	2	3	2.33333333	2
Morocco	2005	permitted	permitted	restricted	2	2	3	2.33333333	2
Morocco	2006	permitted	permitted	restricted	2	2	3	2.33333333	2
Morocco	2007	permitted	restricted	prohibited	2	3	4	3	3
Morocco	2008	permitted	restricted	prohibited	2	3	4	3	3
Morocco	2009	permitted	restricted	prohibited	2	3	4	3	3

Morocco	2010	permitted	restricted	prohibited	2	3	4	3	3
Morocco	2011	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Morocco	2012	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Oman	2000	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Oman	2001	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Oman	2002	permitted	prohibited	prohibited	2	4	4	3.33333333	3
Oman	2003	unrestricted	prohibited	prohibited	1	4	4	3	3
Oman	2004	unrestricted	prohibited	prohibited	1	4	4	3	3
Oman	2005	unrestricted	prohibited	prohibited	1	4	4	3	3
Oman	2006	unrestricted	prohibited	prohibited	1	4	4	3	3
Oman	2007	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Oman	2008	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Oman	2009	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Oman	2010	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Oman	2011	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Oman	2012	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Pakistan	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2003	permitted	restricted	prohibited	2	3	4	3	3
Pakistan	2004	permitted	restricted	prohibited	2	3	4	3	3
Pakistan	2005	permitted	restricted	prohibited	2	3	4	3	3
Pakistan	2006	permitted	restricted	prohibited	2	3	4	3	3
Pakistan	2007	restricted	restricted	prohibited	3	3	4	3.33333333	3
Pakistan	2008	restricted	restricted	prohibited	3	3	4	3.33333333	3
Pakistan	2009	restricted	restricted	prohibited	3	3	4	3.33333333	3
Pakistan	2010	restricted	restricted	prohibited	3	3	4	3.33333333	3
Pakistan	2011	permitted	restricted	restricted	2	3	3	2.66666667	3
Pakistan	2012	permitted	restricted	restricted	2	3	3	2.66666667	3
Qatar	2000	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Qatar	2001	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Qatar	2002	unrestricted	prohibited	restricted	1	4	3	2.66666667	3
Qatar	2003	unrestricted	unrestricted	unrestricted	1	1	1	1	1
Qatar	2004	unrestricted	unrestricted	unrestricted	1	1	1	1	1
Qatar	2005	unrestricted	unrestricted	unrestricted	1	1	1	1	1
Qatar	2006	unrestricted	unrestricted	unrestricted	1	1	1	1	1
Qatar	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2011	permitted	permitted	prohibited	2	2	4	2.66666667	3
Qatar	2012	permitted	permitted	prohibited	2	2	4	2.66666667	3
Saudi Arabia	2000	permitted	permitted	prohibited	2	2	4	2.66666667	3
Saudi Arabia	2001	permitted	permitted	prohibited	2	2	4	2.66666667	3
Saudi Arabia	2002	permitted	permitted	prohibited	2	2	4	2.66666667	3
Saudi Arabia	2003	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Saudi Arabia	2004	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Saudi Arabia	2005	unrestricted	restricted	prohibited	1	3	4	2.66666667	3

Saudi Arabia	2006	unrestricted	restricted	prohibited	1	3	4	2.66666667	3
Saudi Arabia	2007	permitted	restricted	prohibited	2	3	4	3	3
Saudi Arabia	2008	permitted	restricted	prohibited	2	3	4	3	3
Saudi Arabia	2009	permitted	restricted	prohibited	2	3	4	3	3
Saudi Arabia	2010	permitted	restricted	prohibited	2	3	4	3	3
Saudi Arabia	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2003	permitted	restricted	restricted	2	3	3	2.66666667	3
Tunisia	2004	permitted	restricted	restricted	2	3	3	2.66666667	3
Tunisia	2005	permitted	restricted	restricted	2	3	3	2.66666667	3
Tunisia	2006	permitted	restricted	restricted	2	3	3	2.66666667	3
Tunisia	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2011	restricted	restricted	N/A	3	3	N/A	3	3
Tunisia	2012	restricted	restricted	N/A	3	3	N/A	3	3
Turkey	2000	restricted	permitted	prohibited	3	2	4	3	3
Turkey	2001	restricted	permitted	prohibited	3	2	4	3	3
Turkey	2002	restricted	permitted	prohibited	3	2	4	3	3
Turkey	2003	permitted	permitted	permitted	2	2	2	2	2
Turkey	2004	permitted	permitted	permitted	2	2	2	2	2
Turkey	2005	permitted	permitted	permitted	2	2	2	2	2
Turkey	2006	permitted	permitted	permitted	2	2	2	2	2
Turkey	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2011	permitted	restricted	prohibited	2	3	4	3	3
Turkey	2012	permitted	restricted	prohibited	2	3	4	3	3

Appendix (5 –E): Transformation and Numerical Score for Accounting and Disclosure Requirements for MENA Countries

Country	Year	Accounting and Disclosure Requirements								
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Score
Bahrain	2000	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2001	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2002	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2003	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2004	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2005	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2006	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2007	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Bahrain	2008	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Bahrain	2009	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Bahrain	2010	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Bahrain	2011	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Bahrain	2012	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Egypt	2000	No	Yes	Yes	Yes	No	Yes	No	No	4
Egypt	2001	No	Yes	Yes	Yes	No	Yes	No	No	4
Egypt	2002	No	Yes	Yes	Yes	No	Yes	No	No	4
Egypt	2003	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2004	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2005	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2006	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2007	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2008	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2009	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2010	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Egypt	2011	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Egypt	2012	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Israel	2000	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Israel	2001	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Israel	2002	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Israel	2003	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Israel	2004	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Israel	2005	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Israel	2006	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Israel	2007	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Israel	2008	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Israel	2009	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Israel	2010	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Israel	2011	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Israel	2012	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Jordan	2000	No	Yes	Yes	Yes	No	Yes	No	No	4
Jordan	2001	No	Yes	Yes	Yes	No	Yes	No	No	4
Jordan	2002	No	Yes	Yes	Yes	No	Yes	No	No	4

Jordan	2003	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Jordan	2004	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Jordan	2005	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Jordan	2006	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Jordan	2007	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2008	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2009	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2010	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2011	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Jordan	2012	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Kuwait	2000	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Kuwait	2001	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Kuwait	2002	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Kuwait	2003	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Kuwait	2004	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Kuwait	2005	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Kuwait	2006	No	Yes	Yes	Yes	Yes	Yes	No	Yes	6
Kuwait	2007	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Kuwait	2008	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Kuwait	2009	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Kuwait	2010	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Kuwait	2011	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Kuwait	2012	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Lebanon	2000	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Lebanon	2001	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Lebanon	2002	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Lebanon	2003	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2004	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2005	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2006	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2007	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2008	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2009	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2010	No	Yes	Yes	Yes	No	Yes	Yes	No	5
Lebanon	2011	No	Yes	Yes	Yes	Yes	N/A	No	No	4
Lebanon	2012	No	Yes	Yes	Yes	Yes	N/A	No	No	4
Morocco	2000	No	Yes	Yes	Yes	No	Yes	No	No	4
Morocco	2001	No	Yes	Yes	Yes	No	Yes	No	No	4
Morocco	2002	No	Yes	Yes	Yes	No	Yes	No	No	4
Morocco	2003	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2004	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2005	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2006	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2007	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2008	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2009	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2010	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Morocco	2011	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5

Morocco	2012	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Oman	2000	No	Yes	Yes	Yes	No	Yes	No	No	4
Oman	2001	No	Yes	Yes	Yes	No	Yes	No	No	4
Oman	2002	No	Yes	Yes	Yes	No	Yes	No	No	4
Oman	2003	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Oman	2004	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Oman	2005	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Oman	2006	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Oman	2007	No	No	Yes	Yes	No	No	N/A	N/A	2
Oman	2008	No	No	Yes	Yes	No	No	N/A	N/A	2
Oman	2009	No	No	Yes	Yes	No	No	N/A	N/A	2
Oman	2010	No	No	Yes	Yes	No	No	N/A	N/A	2
Oman	2011	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Oman	2012	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Pakistan	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2003	No	Yes	Yes	Yes	No	Yes	Yes	Yes	6
Pakistan	2004	No	Yes	Yes	Yes	No	Yes	Yes	Yes	6
Pakistan	2005	No	Yes	Yes	Yes	No	Yes	Yes	Yes	6
Pakistan	2006	No	Yes	Yes	Yes	No	Yes	Yes	Yes	6
Pakistan	2007	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Pakistan	2008	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Pakistan	2009	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Pakistan	2010	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Pakistan	2011	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Pakistan	2012	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7
Qatar	2000	No	Yes	Yes	Yes	N/A	Yes	No	N/A	4
Qatar	2001	No	Yes	Yes	Yes	N/A	Yes	No	N/A	4
Qatar	2002	No	Yes	Yes	Yes	N/A	Yes	No	N/A	4
Qatar	2003	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Qatar	2004	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Qatar	2005	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Qatar	2006	No	Yes	Yes	Yes	Yes	Yes	N/A	No	5
Qatar	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2011	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A	5
Qatar	2012	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A	5
Saudi Arabia	2000	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Saudi Arabia	2001	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Saudi Arabia	2002	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Saudi Arabia	2003	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Saudi Arabia	2004	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Saudi Arabia	2005	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Saudi Arabia	2006	No	Yes	Yes	Yes	Yes	Yes	No	No	5
Saudi Arabia	2007	No	Yes	Yes	Yes	N/A	Yes	No	No	4

Saudi Arabia	2008	No	Yes	Yes	Yes	N/A	Yes	No	No	4
Saudi Arabia	2009	No	Yes	Yes	Yes	N/A	Yes	No	No	4
Saudi Arabia	2010	No	Yes	Yes	Yes	N/A	Yes	No	No	4
Saudi Arabia	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2003	No	No	Yes	Yes	No	Yes	No	No	3
Tunisia	2004	No	No	Yes	Yes	No	Yes	No	No	3
Tunisia	2005	No	No	Yes	Yes	No	Yes	No	No	3
Tunisia	2006	No	No	Yes	Yes	No	Yes	No	No	3
Tunisia	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2011	No	Yes	Yes	Yes	No	Yes	No	No	4
Tunisia	2012	No	Yes	Yes	Yes	No	Yes	No	No	4
Turkey	2000	Yes	Yes	Yes	Yes	No	Yes	No	No	5
Turkey	2001	Yes	Yes	Yes	Yes	No	Yes	No	No	5
Turkey	2002	Yes	Yes	Yes	Yes	No	Yes	No	No	5
Turkey	2003	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Turkey	2004	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Turkey	2005	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Turkey	2006	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6
Turkey	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2011	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Turkey	2012	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6

Appendix (5 –F): Transformation and Numerical Score for External Auditing Requirements for MENA Countries

Country	Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Score
Bahrain	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2003	Yes	No	No	Yes	Yes	Yes	Yes	No	5
Bahrain	2004	Yes	No	No	Yes	Yes	Yes	Yes	No	5
Bahrain	2005	Yes	No	No	Yes	Yes	Yes	Yes	No	5
Bahrain	2006	Yes	No	No	Yes	Yes	Yes	Yes	No	5
Bahrain	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Bahrain	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Egypt	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Israel	2000	Yes	Yes	Yes	Yes	No	No	No	N/A	4
Israel	2001	Yes	Yes	Yes	Yes	No	No	No	N/A	4
Israel	2002	Yes	Yes	Yes	Yes	No	No	No	N/A	4
Israel	2003	Yes	Yes	Yes	Yes	Yes	No	No	No	5
Israel	2004	Yes	Yes	Yes	Yes	Yes	No	No	No	5
Israel	2005	Yes	Yes	Yes	Yes	Yes	No	No	No	5
Israel	2006	Yes	Yes	Yes	Yes	Yes	No	No	No	5
Israel	2007	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Israel	2008	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Israel	2009	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Israel	2010	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Israel	2011	Yes	Yes	Yes	Yes	No	Yes	No	N/A	5
Israel	2012	Yes	Yes	Yes	Yes	No	Yes	No	N/A	5
Jordan	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Jordan	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Jordan	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7

Country	Year									
Jordan	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Jordan	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Jordan	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Jordan	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Jordan	2007	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2008	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2009	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2010	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Jordan	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7
Jordan	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7
Kuwait	2000	Yes	No	Yes	Yes	Yes	Yes	Yes	No	6
Kuwait	2001	Yes	No	Yes	Yes	Yes	Yes	Yes	No	6
Kuwait	2002	Yes	No	Yes	Yes	Yes	Yes	Yes	No	6
Kuwait	2003	Yes	No	Yes	Yes	Yes	Yes	Yes	No	6
Kuwait	2004	Yes	No	Yes	Yes	Yes	Yes	Yes	No	6
Kuwait	2005	Yes	No	Yes	Yes	Yes	Yes	Yes	No	6
Kuwait	2006	Yes	No	Yes	Yes	Yes	Yes	Yes	No	6
Kuwait	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Kuwait	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Kuwait	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Kuwait	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Kuwait	2011	Yes	Yes	Yes	Yes	Yes	No	Yes	N/A	6
Kuwait	2012	Yes	Yes	Yes	Yes	Yes	No	Yes	N/A	6
Lebanon	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Lebanon	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Morocco	2000	Yes	No	No	Yes	Yes	Yes	No	N/A	4
Morocco	2001	Yes	No	No	Yes	Yes	Yes	No	N/A	4
Morocco	2002	Yes	No	No	Yes	Yes	Yes	No	N/A	4
Morocco	2003	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2004	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2005	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2006	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2007	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2008	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2009	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2010	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Morocco	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7

Morocco	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7
Oman	2000	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Oman	2001	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Oman	2002	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Oman	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Oman	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Qatar	2000	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Qatar	2001	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Qatar	2002	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Qatar	2003	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Qatar	2004	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Qatar	2005	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Qatar	2006	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Qatar	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Qatar	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Saudi Arabia	2007	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6

Saudi Arabia	2008	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Saudi Arabia	2009	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Saudi Arabia	2010	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Saudi Arabia	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Tunisia	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Tunisia	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Tunisia	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Tunisia	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Tunisia	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Appendix (5 –G): Transformation and Numerical Score for Entry into Banking Requirements for MENA Countries

Country	Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Score
Bahrain	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Bahrain	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2000	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Egypt	2001	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Egypt	2002	Yes	Yes	Yes	Yes	Yes	Yes	No	No	6
Egypt	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Egypt	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Israel	2000	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Israel	2001	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Israel	2002	Yes	Yes	Yes	Yes	Yes	No	Yes	No	6
Israel	2003	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2004	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2005	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2006	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2007	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2008	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2009	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2010	No	No	Yes	No	Yes	Yes	No	No	3
Israel	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Israel	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Jordan	2003	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	7
Jordan	2004	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	7
Jordan	2005	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	7
Jordan	2006	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	7
Jordan	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Jordan	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2000	Yes	Yes	Yes	No	Yes	Yes	No	No	5
Kuwait	2001	Yes	Yes	Yes	No	Yes	Yes	No	No	5
Kuwait	2002	Yes	Yes	Yes	No	Yes	Yes	No	No	5
Kuwait	2003	Yes	Yes	Yes	No	Yes	Yes	Yes	No	6
Kuwait	2004	Yes	Yes	Yes	No	Yes	Yes	Yes	No	6
Kuwait	2005	Yes	Yes	Yes	No	Yes	Yes	Yes	No	6
Kuwait	2006	Yes	Yes	Yes	No	Yes	Yes	Yes	No	6
Kuwait	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Kuwait	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Lebanon	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Morocco	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Morocco	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Oman	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Pakistan	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Pakistan	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Qatar	2003	Yes	No	Yes	No	No	Yes	No	Yes	4
Qatar	2004	Yes	No	Yes	No	No	Yes	No	Yes	4
Qatar	2005	Yes	No	Yes	No	No	Yes	No	Yes	4
Qatar	2006	Yes	No	Yes	No	No	Yes	No	Yes	4
Qatar	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2011	N/A	Yes	Yes	Yes	Yes	No	Yes	Yes	6
Qatar	2012	N/A	Yes	Yes	Yes	Yes	No	Yes	Yes	6
Saudi Arabia	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Saudi Arabia	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Saudi Arabia	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Tunisia	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Tunisia	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Tunisia	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Tunisia	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Tunisia	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2000	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	7
Turkey	2001	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	7
Turkey	2002	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	7
Turkey	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7
Turkey	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
Turkey	2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8

Appendix (5 –H): Transformation and Numerical Score for Official Disciplinary Power of the Supervisory Agency for MENA Countries

Country	Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Score
Bahrain	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Bahrain	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Bahrain	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Bahrain	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Bahrain	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Bahrain	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Bahrain	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Bahrain	2007	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	10
Bahrain	2008	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	10
Bahrain	2009	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	10
Bahrain	2010	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	10
Bahrain	2011	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	11
Bahrain	2012	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	11
Egypt	2000	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	N/A	10
Egypt	2001	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	N/A	10
Egypt	2002	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	N/A	10
Egypt	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A	12
Egypt	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A	12
Egypt	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A	12
Egypt	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A	12
Egypt	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	12
Egypt	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	12
Egypt	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	12
Egypt	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	12
Egypt	2011	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	11
Egypt	2012	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	11
Israel	2000	No	Yes	Yes	No	No	No	Yes	Yes	No	N/A	Yes	Yes	Yes	N/A	7
Israel	2001	No	Yes	Yes	No	No	No	Yes	Yes	No	N/A	Yes	Yes	Yes	N/A	7
Israel	2002	No	Yes	Yes	No	No	No	Yes	Yes	No	N/A	Yes	Yes	Yes	N/A	7
Israel	2003	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	No	No	Yes	No	6
Israel	2004	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	No	No	Yes	No	6
Israel	2005	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	No	No	Yes	No	6
Israel	2006	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	No	No	Yes	No	6
Israel	2007	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	Yes	Yes	Yes	No	8
Israel	2008	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	Yes	Yes	Yes	No	8
Israel	2009	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	Yes	Yes	Yes	No	8
Israel	2010	No	Yes	Yes	Yes	Yes	Yes	No	N/A	No	No	Yes	Yes	Yes	No	8
Israel	2011	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	No	8
Israel	2012	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	No	8
Jordan	2000	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	5
Jordan	2001	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	5
Jordan	2002	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	5

Country	Year															Total
Jordan	2003	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	12
Jordan	2004	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	12
Jordan	2005	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	12
Jordan	2006	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	12
Jordan	2007	N/A	No	Yes	No	No	Yes	Yes	Yes	No	N/A	Yes	Yes	N/A	N/A	6
Jordan	2008	N/A	No	Yes	No	No	Yes	Yes	Yes	No	N/A	Yes	Yes	N/A	N/A	6
Jordan	2009	N/A	No	Yes	No	No	Yes	Yes	Yes	No	N/A	Yes	Yes	N/A	N/A	6
Jordan	2010	N/A	No	Yes	No	No	Yes	Yes	Yes	No	N/A	Yes	Yes	N/A	N/A	6
Jordan	2011	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	13
Jordan	2012	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	13
Kuwait	2000	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	10
Kuwait	2001	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	10
Kuwait	2002	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	10
Kuwait	2003	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	10
Kuwait	2004	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	10
Kuwait	2005	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	10
Kuwait	2006	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	10
Kuwait	2007	Yes	N/A	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	8
Kuwait	2008	Yes	N/A	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	8
Kuwait	2009	Yes	N/A	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	8
Kuwait	2010	Yes	N/A	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	8
Kuwait	2011	Yes	Yes	Yes	No	No	N/A	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	10
Kuwait	2012	Yes	Yes	Yes	No	No	N/A	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	10
Lebanon	2000	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	11
Lebanon	2001	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	11
Lebanon	2002	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	11
Lebanon	2003	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	No	9
Lebanon	2004	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	No	9
Lebanon	2005	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	No	9
Lebanon	2006	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	No	9
Lebanon	2007	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	No	8
Lebanon	2008	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	No	8
Lebanon	2009	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	No	8
Lebanon	2010	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	No	8
Lebanon	2011	No	Yes	Yes	No	No	No	No	Yes	Yes	N/A	N/A	N/A	Yes	No	5
Lebanon	2012	No	Yes	Yes	No	No	No	No	Yes	Yes	N/A	N/A	N/A	Yes	No	5
Morocco	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Morocco	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Morocco	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Morocco	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	No	11
Morocco	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	No	11
Morocco	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	No	11
Morocco	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	No	11
Morocco	2007	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Morocco	2008	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Morocco	2009	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Morocco	2010	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Morocco	2011	Yes	Yes	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	9

Country	Year															
Morocco	2012	Yes	Yes	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	9
Oman	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Oman	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Oman	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Oman	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Oman	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Oman	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Oman	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	13
Oman	2007	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	9
Oman	2008	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	9
Oman	2009	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	9
Oman	2010	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	9
Oman	2011	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	13
Oman	2012	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	13
Pakistan	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pakistan	2003	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Pakistan	2004	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Pakistan	2005	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Pakistan	2006	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	12
Pakistan	2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Pakistan	2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Pakistan	2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Pakistan	2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	12
Pakistan	2011	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	12
Pakistan	2012	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	12
Qatar	2000	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	13
Qatar	2001	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	13
Qatar	2002	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	13
Qatar	2003	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	9
Qatar	2004	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	9
Qatar	2005	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	9
Qatar	2006	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	9
Qatar	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Qatar	2011	Yes	Yes	Yes	Yes	Yes	No	No	Yes	N/A	No	No	No	Yes	Yes	8
Qatar	2012	Yes	Yes	Yes	Yes	Yes	No	No	Yes	N/A	No	No	No	Yes	Yes	8
Saudi Arabia	2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	13
Saudi Arabia	2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	13
Saudi Arabia	2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	13
Saudi Arabia	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	12
Saudi Arabia	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	12
Saudi Arabia	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	12
Saudi Arabia	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A	12
Saudi Arabia	2007	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	11

Country	Year															
Saudi Arabia	2008	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	11
Saudi Arabia	2009	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	11
Saudi Arabia	2010	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	11
Saudi Arabia	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2003	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	11
Tunisia	2004	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	11
Tunisia	2005	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	11
Tunisia	2006	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	11
Tunisia	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tunisia	2011	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	Yes	7
Tunisia	2012	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	Yes	7
Turkey	2000	No	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	8
Turkey	2001	No	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	8
Turkey	2002	No	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	8
Turkey	2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	13
Turkey	2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	13
Turkey	2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	13
Turkey	2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	13
Turkey	2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	2011	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	N/A	N/A	N/A	No	8
Turkey	2012	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	N/A	N/A	N/A	No	8

Appendix (5 –I): Transformation and Numerical Score for Liquidity and Diversification Requirements for MENA Countries

Country	Year	Liquidity and Diversification Requirements			
		Q1	Q2	Q3	Score
Bahrain	2000	Yes	No	Yes	3
Bahrain	2001	Yes	No	Yes	3
Bahrain	2002	Yes	No	Yes	3
Bahrain	2003	Yes	No	Yes	3
Bahrain	2004	Yes	No	Yes	3
Bahrain	2005	Yes	No	Yes	3
Bahrain	2006	Yes	No	Yes	3
Bahrain	2007	No	No	Yes	2
Bahrain	2008	No	No	Yes	2
Bahrain	2009	No	No	Yes	2
Bahrain	2010	No	No	Yes	2
Bahrain	2011	Yes	No	No	2
Bahrain	2012	Yes	No	No	2
Egypt	2000	Yes	No	Yes	3
Egypt	2001	Yes	No	Yes	3
Egypt	2002	Yes	No	Yes	3
Egypt	2003	Yes	No	Yes	3
Egypt	2004	Yes	No	Yes	3
Egypt	2005	Yes	No	Yes	3
Egypt	2006	Yes	No	Yes	3
Egypt	2007	Yes	No	Yes	3
Egypt	2008	Yes	No	Yes	3
Egypt	2009	Yes	No	Yes	3
Egypt	2010	Yes	No	Yes	3
Egypt	2011	Yes	No	Yes	3
Egypt	2012	Yes	No	Yes	3
Israel	2000	No	No	None	1
Israel	2001	No	No	None	1
Israel	2002	No	No	None	1
Israel	2003	Yes	No	Yes	3
Israel	2004	Yes	No	Yes	3
Israel	2005	Yes	No	Yes	3
Israel	2006	Yes	No	Yes	3
Israel	2007	Yes	No	Yes	3
Israel	2008	Yes	No	Yes	3
Israel	2009	Yes	No	Yes	3
Israel	2010	Yes	No	Yes	3
Israel	2011	Yes	No	No	2
Israel	2012	Yes	No	No	2
Jordan	2000	Yes	No	Yes	3

Jordan	2001	Yes	No	Yes	3
Jordan	2002	Yes	No	Yes	3
Jordan	2003	Yes	Yes	Yes	2
Jordan	2004	Yes	Yes	Yes	2
Jordan	2005	Yes	Yes	Yes	2
Jordan	2006	Yes	Yes	Yes	2
Jordan	2007	Yes	Yes	Yes	2
Jordan	2008	Yes	Yes	Yes	2
Jordan	2009	Yes	Yes	Yes	2
Jordan	2010	Yes	Yes	Yes	2
Jordan	2011	Yes	Yes	Yes	2
Jordan	2012	Yes	Yes	Yes	2
Kuwait	2000	Yes	No	Yes	3
Kuwait	2001	Yes	No	Yes	3
Kuwait	2002	Yes	No	Yes	3
Kuwait	2003	Yes	No	Yes	3
Kuwait	2004	Yes	No	Yes	3
Kuwait	2005	Yes	No	Yes	3
Kuwait	2006	Yes	No	Yes	3
Kuwait	2007	Yes	No	Yes	3
Kuwait	2008	Yes	No	Yes	3
Kuwait	2009	Yes	No	Yes	3
Kuwait	2010	Yes	No	Yes	3
Kuwait	2011	No	No	No	1
Kuwait	2012	No	No	No	1
Lebanon	2000	No	No	Yes	2
Lebanon	2001	No	No	Yes	2
Lebanon	2002	No	No	Yes	2
Lebanon	2003	Yes	Yes	Yes	2
Lebanon	2004	Yes	Yes	Yes	2
Lebanon	2005	Yes	Yes	Yes	2
Lebanon	2006	Yes	Yes	Yes	2
Lebanon	2007	Yes	No	Yes	3
Lebanon	2008	Yes	No	Yes	3
Lebanon	2009	Yes	No	Yes	3
Lebanon	2010	Yes	No	Yes	3
Lebanon	2011	Yes	No	Yes	3
Lebanon	2012	Yes	No	Yes	3
Morocco	2000	No	No	Yes	2
Morocco	2001	No	No	Yes	2
Morocco	2002	No	No	Yes	2
Morocco	2003	No	No	Yes	2
Morocco	2004	No	No	Yes	2
Morocco	2005	No	No	Yes	2
Morocco	2006	No	No	Yes	2
Morocco	2007	No	No	Yes	2
Morocco	2008	No	No	Yes	2
Morocco	2009	No	No	Yes	2

Morocco	2010	No	No	Yes	2
Morocco	2011	No	No	No	1
Morocco	2012	No	No	No	1
Oman	2000	Yes	No	Yes	3
Oman	2001	Yes	No	Yes	3
Oman	2002	Yes	No	Yes	3
Oman	2003	Yes	No	Yes	3
Oman	2004	Yes	No	Yes	3
Oman	2005	Yes	No	Yes	3
Oman	2006	Yes	No	Yes	3
Oman	2007	No	No	Yes	2
Oman	2008	No	No	Yes	2
Oman	2009	No	No	Yes	2
Oman	2010	No	No	Yes	2
Oman	2011	Yes	No	No	2
Oman	2012	Yes	No	No	2
Pakistan	2000	N/A	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A	N/A
Pakistan	2003	No	No	Yes	2
Pakistan	2004	No	No	Yes	2
Pakistan	2005	No	No	Yes	2
Pakistan	2006	No	No	Yes	2
Pakistan	2007	No	No	Yes	2
Pakistan	2008	No	No	Yes	2
Pakistan	2009	No	No	Yes	2
Pakistan	2010	No	No	Yes	2
Pakistan	2011	Yes	Yes	Yes	2
Pakistan	2012	Yes	Yes	Yes	2
Qatar	2000	Yes	No	Yes	3
Qatar	2001	Yes	No	Yes	3
Qatar	2002	Yes	No	Yes	3
Qatar	2003	Yes	No	Yes	3
Qatar	2004	Yes	No	Yes	3
Qatar	2005	Yes	No	Yes	3
Qatar	2006	Yes	No	Yes	3
Qatar	2007	N/A	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A	N/A
Qatar	2011	Yes	No	No	2
Qatar	2012	Yes	No	No	2
Saudi Arabia	2000	Yes	No	Yes	3
Saudi Arabia	2001	Yes	No	Yes	3
Saudi Arabia	2002	Yes	No	Yes	3
Saudi Arabia	2003	Yes	No	Yes	3
Saudi Arabia	2004	Yes	No	Yes	3
Saudi Arabia	2005	Yes	No	Yes	3

Saudi Arabia	2006	Yes	No	Yes	3
Saudi Arabia	2007	Yes	No	Yes	3
Saudi Arabia	2008	Yes	No	Yes	3
Saudi Arabia	2009	Yes	No	Yes	3
Saudi Arabia	2010	Yes	No	Yes	3
Saudi Arabia	2011	N/A	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A	N/A
Tunisia	2003	No	Yes	Yes	1
Tunisia	2004	No	Yes	Yes	1
Tunisia	2005	No	Yes	Yes	1
Tunisia	2006	No	Yes	Yes	1
Tunisia	2007	N/A	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A	N/A
Tunisia	2011	No	Yes	No	0
Tunisia	2012	No	Yes	No	0
Turkey	2000	No	No	Yes	2
Turkey	2001	No	No	Yes	2
Turkey	2002	No	No	Yes	2
Turkey	2003	No	No	Yes	2
Turkey	2004	No	No	Yes	2
Turkey	2005	No	No	Yes	2
Turkey	2006	No	No	Yes	2
Turkey	2007	N/A	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A	N/A
Turkey	2011	No	No	Yes	2
Turkey	2012	No	No	Yes	2

Appendix (5 –J): Transformation and Numerical Score for Internal Management and Organisational Requirements for MENA Countries

Country	Year	Internal Management and Organisational Requirements		
		Q1	Q2	Score
Bahrain	2000	Yes	No	1
Bahrain	2001	Yes	No	1
Bahrain	2002	Yes	No	1
Bahrain	2003	Yes	Yes	2
Bahrain	2004	Yes	Yes	2
Bahrain	2005	Yes	Yes	2
Bahrain	2006	Yes	Yes	2
Bahrain	2007	Yes	Yes	2
Bahrain	2008	Yes	Yes	2
Bahrain	2009	Yes	Yes	2
Bahrain	2010	Yes	Yes	2
Bahrain	2011	Yes	Yes	2
Bahrain	2012	Yes	Yes	2
Egypt	2000	Yes	No	1
Egypt	2001	Yes	No	1
Egypt	2002	Yes	No	1
Egypt	2003	Yes	Yes	2
Egypt	2004	Yes	Yes	2
Egypt	2005	Yes	Yes	2
Egypt	2006	Yes	Yes	2
Egypt	2007	Yes	Yes	2
Egypt	2008	Yes	Yes	2
Egypt	2009	Yes	Yes	2
Egypt	2010	Yes	Yes	2
Egypt	2011	Yes	Yes	2
Egypt	2012	Yes	Yes	2
Israel	2000	Yes	No	1
Israel	2001	Yes	No	1
Israel	2002	Yes	No	1
Israel	2003	Yes	Yes	2
Israel	2004	Yes	Yes	2
Israel	2005	Yes	Yes	2
Israel	2006	Yes	Yes	2
Israel	2007	Yes	N/A	1
Israel	2008	Yes	N/A	1
Israel	2009	Yes	N/A	1
Israel	2010	Yes	N/A	1
Israel	2011	Yes	N/A	1
Israel	2012	Yes	N/A	1
Jordan	2000	Yes	Yes	2

Jordan	2001	Yes	Yes	2
Jordan	2002	Yes	Yes	2
Jordan	2003	Yes	Yes	2
Jordan	2004	Yes	Yes	2
Jordan	2005	Yes	Yes	2
Jordan	2006	Yes	Yes	2
Jordan	2007	Yes	No	1
Jordan	2008	Yes	No	1
Jordan	2009	Yes	No	1
Jordan	2010	Yes	No	1
Jordan	2011	Yes	No	1
Jordan	2012	Yes	No	1
Kuwait	2000	Yes	Yes	2
Kuwait	2001	Yes	Yes	2
Kuwait	2002	Yes	Yes	2
Kuwait	2003	Yes	Yes	2
Kuwait	2004	Yes	Yes	2
Kuwait	2005	Yes	Yes	2
Kuwait	2006	Yes	Yes	2
Kuwait	2007	Yes	Yes	2
Kuwait	2008	Yes	Yes	2
Kuwait	2009	Yes	Yes	2
Kuwait	2010	Yes	Yes	2
Kuwait	2011	Yes	Yes	2
Kuwait	2012	Yes	Yes	2
Lebanon	2000	Yes	Yes	2
Lebanon	2001	Yes	Yes	2
Lebanon	2002	Yes	Yes	2
Lebanon	2003	Yes	Yes	2
Lebanon	2004	Yes	Yes	2
Lebanon	2005	Yes	Yes	2
Lebanon	2006	Yes	Yes	2
Lebanon	2007	Yes	Yes	2
Lebanon	2008	Yes	Yes	2
Lebanon	2009	Yes	Yes	2
Lebanon	2010	Yes	Yes	2
Lebanon	2011	Yes	Yes	2
Lebanon	2012	Yes	Yes	2
Morocco	2000	No	N/A	0
Morocco	2001	No	N/A	0
Morocco	2002	No	N/A	0
Morocco	2003	Yes	No	1
Morocco	2004	Yes	No	1
Morocco	2005	Yes	No	1
Morocco	2006	Yes	No	1
Morocco	2007	Yes	No	1
Morocco	2008	Yes	No	1
Morocco	2009	Yes	No	1

Morocco	2010	Yes	No	1
Morocco	2011	Yes	No	1
Morocco	2012	Yes	No	1
Oman	2000	Yes	Yes	2
Oman	2001	Yes	Yes	2
Oman	2002	Yes	Yes	2
Oman	2003	Yes	Yes	2
Oman	2004	Yes	Yes	2
Oman	2005	Yes	Yes	2
Oman	2006	Yes	Yes	2
Oman	2007	Yes	No	1
Oman	2008	Yes	No	1
Oman	2009	Yes	No	1
Oman	2010	Yes	No	1
Oman	2011	Yes	No	1
Oman	2012	Yes	No	1
Pakistan	2000	N/A	N/A	N/A
Pakistan	2001	N/A	N/A	N/A
Pakistan	2002	N/A	N/A	N/A
Pakistan	2003	Yes	Yes	2
Pakistan	2004	Yes	Yes	2
Pakistan	2005	Yes	Yes	2
Pakistan	2006	Yes	Yes	2
Pakistan	2007	Yes	Yes	2
Pakistan	2008	Yes	Yes	2
Pakistan	2009	Yes	Yes	2
Pakistan	2010	Yes	Yes	2
Pakistan	2011	Yes	Yes	2
Pakistan	2012	Yes	Yes	2
Qatar	2000	Yes	No	1
Qatar	2001	Yes	No	1
Qatar	2002	Yes	No	1
Qatar	2003	Yes	No	1
Qatar	2004	Yes	No	1
Qatar	2005	Yes	No	1
Qatar	2006	Yes	No	1
Qatar	2007	N/A	N/A	N/A
Qatar	2008	N/A	N/A	N/A
Qatar	2009	N/A	N/A	N/A
Qatar	2010	N/A	N/A	N/A
Qatar	2011	Yes	No	1
Qatar	2012	Yes	No	1
Saudi Arabia	2000	Yes	No	1
Saudi Arabia	2001	Yes	No	1
Saudi Arabia	2002	Yes	No	1
Saudi Arabia	2003	Yes	No	1
Saudi Arabia	2004	Yes	No	1
Saudi Arabia	2005	Yes	No	1

Saudi Arabia	2006	Yes	No	1
Saudi Arabia	2007	Yes	No	1
Saudi Arabia	2008	Yes	No	1
Saudi Arabia	2009	Yes	No	1
Saudi Arabia	2010	Yes	No	1
Saudi Arabia	2011	N/A	N/A	N/A
Saudi Arabia	2012	N/A	N/A	N/A
Tunisia	2000	N/A	N/A	N/A
Tunisia	2001	N/A	N/A	N/A
Tunisia	2002	N/A	N/A	N/A
Tunisia	2003	Yes	No	1
Tunisia	2004	Yes	No	1
Tunisia	2005	Yes	No	1
Tunisia	2006	Yes	No	1
Tunisia	2007	N/A	N/A	N/A
Tunisia	2008	N/A	N/A	N/A
Tunisia	2009	N/A	N/A	N/A
Tunisia	2010	N/A	N/A	N/A
Tunisia	2011	No	No	0
Tunisia	2012	No	No	0
Turkey	2000	Yes	No	1
Turkey	2001	Yes	No	1
Turkey	2002	Yes	No	1
Turkey	2003	Yes	Yes	2
Turkey	2004	Yes	Yes	2
Turkey	2005	Yes	Yes	2
Turkey	2006	Yes	Yes	2
Turkey	2007	N/A	N/A	N/A
Turkey	2008	N/A	N/A	N/A
Turkey	2009	N/A	N/A	N/A
Turkey	2010	N/A	N/A	N/A
Turkey	2011	Yes	Yes	2
Turkey	2012	Yes	Yes	2

Appendix (6 –A): Fitch Long-Term Issuer Ratings and Linear Transformation Scale for MENA Banks

Bank Name	Country Name	Year	Fitch Ratings	Linear Transformation Scale
Ahli United Bank BSC	Bahrain	2000	N/A	N/A
Ahli United Bank BSC	Bahrain	2001	N/A	N/A
Ahli United Bank BSC	Bahrain	2002	N/A	N/A
Ahli United Bank BSC	Bahrain	2003	BBB+	14
Ahli United Bank BSC	Bahrain	2004	BBB+	14
Ahli United Bank BSC	Bahrain	2005	BBB+	14
Ahli United Bank BSC	Bahrain	2006	A-	15
Ahli United Bank BSC	Bahrain	2007	A-	15
Ahli United Bank BSC	Bahrain	2008	A-	15
Ahli United Bank BSC	Bahrain	2009	A-	15
Ahli United Bank BSC	Bahrain	2010	A-	15
Ahli United Bank BSC	Bahrain	2011	BBB+	14
Ahli United Bank BSC	Bahrain	2012	BBB+	14
Arab Banking Corporation B.S.C.	Bahrain	2000	BBB-	12
Arab Banking Corporation B.S.C.	Bahrain	2001	BBB-	12
Arab Banking Corporation B.S.C.	Bahrain	2002	BBB-	12
Arab Banking Corporation B.S.C.	Bahrain	2003	BBB-	12
Arab Banking Corporation B.S.C.	Bahrain	2004	BBB-	12
Arab Banking Corporation B.S.C.	Bahrain	2005	BBB	13
Arab Banking Corporation B.S.C.	Bahrain	2006	BBB	13
Arab Banking Corporation B.S.C.	Bahrain	2007	BBB+	14
Arab Banking Corporation B.S.C.	Bahrain	2008	BBB+	14
Arab Banking Corporation B.S.C.	Bahrain	2009	BBB+	14
Arab Banking Corporation B.S.C.	Bahrain	2010	BBB	13
Arab Banking Corporation B.S.C.	Bahrain	2011	BB	10
Arab Banking Corporation B.S.C.	Bahrain	2012	BB+	11
Banco ABC Brasil S.A.	Bahrain	2000	N/A	N/A
Banco ABC Brasil S.A.	Bahrain	2001	N/A	N/A
Banco ABC Brasil S.A.	Bahrain	2002	N/A	N/A
Banco ABC Brasil S.A.	Bahrain	2003	N/A	N/A
Banco ABC Brasil S.A.	Bahrain	2004	N/A	N/A
Banco ABC Brasil S.A.	Bahrain	2005	BB-	9
Banco ABC Brasil S.A.	Bahrain	2006	BB	10
Banco ABC Brasil S.A.	Bahrain	2007	BB+	11
Banco ABC Brasil S.A.	Bahrain	2008	BB+	11
Banco ABC Brasil S.A.	Bahrain	2009	BB+	11
Banco ABC Brasil S.A.	Bahrain	2010	BB+	11
Banco ABC Brasil S.A.	Bahrain	2011	BB+	11
Banco ABC Brasil S.A.	Bahrain	2012	BB+	11
BBK B.S.C.	Bahrain	2000	N/A	N/A
BBK B.S.C.	Bahrain	2001	N/A	N/A
BBK B.S.C.	Bahrain	2002	N/A	N/A
BBK B.S.C.	Bahrain	2003	N/A	N/A
BBK B.S.C.	Bahrain	2004	N/A	N/A
BBK B.S.C.	Bahrain	2005	N/A	N/A

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BBK B.S.C.	Bahrain	2006	A-	15
BBK B.S.C.	Bahrain	2007	A-	15
BBK B.S.C.	Bahrain	2008	A-	15
BBK B.S.C.	Bahrain	2009	A-	15
BBK B.S.C.	Bahrain	2010	A-	15
BBK B.S.C.	Bahrain	2011	BBB-	12
BBK B.S.C.	Bahrain	2012	BBB-	12
BMB Investment Bank	Bahrain	2000	BBB-	12
BMB Investment Bank	Bahrain	2001	B+	8
BMB Investment Bank	Bahrain	2002	DDD	1
BMB Investment Bank	Bahrain	2003	DDD	1
BMB Investment Bank	Bahrain	2004	DDD	1
BMB Investment Bank	Bahrain	2005	C	2
BMB Investment Bank	Bahrain	2006	CCC	4
BMB Investment Bank	Bahrain	2007	B-	6
BMB Investment Bank	Bahrain	2008	B-	6
BMB Investment Bank	Bahrain	2009	B-	6
BMB Investment Bank	Bahrain	2010	B-	6
BMB Investment Bank	Bahrain	2011	B-	6
BMB Investment Bank	Bahrain	2012	B-	6
Gulf International Bank B.S.C.	Bahrain	2000	BBB+	14
Gulf International Bank B.S.C.	Bahrain	2001	BBB+	14
Gulf International Bank B.S.C.	Bahrain	2002	BBB+	14
Gulf International Bank B.S.C.	Bahrain	2003	A-	15
Gulf International Bank B.S.C.	Bahrain	2004	A-	15
Gulf International Bank B.S.C.	Bahrain	2005	A-	15
Gulf International Bank B.S.C.	Bahrain	2006	A	16
Gulf International Bank B.S.C.	Bahrain	2007	A	16
Gulf International Bank B.S.C.	Bahrain	2008	A	16
Gulf International Bank B.S.C.	Bahrain	2009	A	16
Gulf International Bank B.S.C.	Bahrain	2010	A	16
Gulf International Bank B.S.C.	Bahrain	2011	A	16
Gulf International Bank B.S.C.	Bahrain	2012	A	16
Investcorp Bank B.S.C	Bahrain	2000	BBB	13
Investcorp Bank B.S.C	Bahrain	2001	BBB	13
Investcorp Bank B.S.C	Bahrain	2002	BBB	13
Investcorp Bank B.S.C	Bahrain	2003	BBB	13
Investcorp Bank B.S.C	Bahrain	2004	BBB	13
Investcorp Bank B.S.C	Bahrain	2005	BBB	13
Investcorp Bank B.S.C	Bahrain	2006	BBB	13
Investcorp Bank B.S.C	Bahrain	2007	BBB	13
Investcorp Bank B.S.C	Bahrain	2008	BBB	13
Investcorp Bank B.S.C	Bahrain	2009	BB+	11
Investcorp Bank B.S.C	Bahrain	2010	BB+	11
Investcorp Bank B.S.C	Bahrain	2011	BB+	11
Investcorp Bank B.S.C	Bahrain	2012	BB	10
National Bank of Bahrain BSC	Bahrain	2000	N/A	N/A
National Bank of Bahrain BSC	Bahrain	2001	BBB	13
National Bank of Bahrain BSC	Bahrain	2002	BBB	13
National Bank of Bahrain BSC	Bahrain	2003	A-	15
National Bank of Bahrain BSC	Bahrain	2004	A-	15
National Bank of Bahrain BSC	Bahrain	2005	A-	15
National Bank of Bahrain BSC	Bahrain	2006	A-	15
National Bank of Bahrain BSC	Bahrain	2007	A	16

National Bank of Bahrain BSC	Bahrain	2008	A	16
National Bank of Bahrain BSC	Bahrain	2009	A	16
National Bank of Bahrain BSC	Bahrain	2010	A	16
National Bank of Bahrain BSC	Bahrain	2011	BBB	13
National Bank of Bahrain BSC	Bahrain	2012	BBB	13
Commercial International Bank (Egypt) SAE	Egypt	2000	N/A	N/A
Commercial International Bank (Egypt) SAE	Egypt	2001	BBB-	12
Commercial International Bank (Egypt) SAE	Egypt	2002	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2003	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2004	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2005	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2006	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2007	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2008	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2009	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2010	BB+	11
Commercial International Bank (Egypt) SAE	Egypt	2011	BB	10
Commercial International Bank (Egypt) SAE	Egypt	2012	B+	8
National Bank of Egypt	Egypt	2000	N/A	N/A
National Bank of Egypt	Egypt	2001	N/A	N/A
National Bank of Egypt	Egypt	2002	BB+	11
National Bank of Egypt	Egypt	2003	BB+	11
National Bank of Egypt	Egypt	2004	BB+	11
National Bank of Egypt	Egypt	2005	BB+	11
National Bank of Egypt	Egypt	2006	BB+	11
National Bank of Egypt	Egypt	2007	BB+	11
National Bank of Egypt	Egypt	2008	BB+	11
National Bank of Egypt	Egypt	2009	BB+	11
National Bank of Egypt	Egypt	2010	BB+	11
National Bank of Egypt	Egypt	2011	BB	10
National Bank of Egypt	Egypt	2012	B+	8
Bank of Industry and Mine	Iran	2000	N/A	N/A
Bank of Industry and Mine	Iran	2001	N/A	N/A
Bank of Industry and Mine	Iran	2002	N/A	N/A
Bank of Industry and Mine	Iran	2003	N/A	N/A
Bank of Industry and Mine	Iran	2004	N/A	N/A
Bank of Industry and Mine	Iran	2005	BB-	9
Bank of Industry and Mine	Iran	2006	B+	8
Bank of Industry and Mine	Iran	2007	B+	8
Bank of Industry and Mine	Iran	2008	N/A	N/A
Bank of Industry and Mine	Iran	2009	N/A	N/A
Bank of Industry and Mine	Iran	2010	N/A	N/A
Bank of Industry and Mine	Iran	2011	N/A	N/A
Bank of Industry and Mine	Iran	2012	N/A	N/A
Export Development Bank of Iran	Iran	2000	N/A	N/A
Export Development Bank of Iran	Iran	2001	N/A	N/A
Export Development Bank of Iran	Iran	2002	N/A	N/A
Export Development Bank of Iran	Iran	2003	N/A	N/A
Export Development Bank of Iran	Iran	2004	N/A	N/A
Export Development Bank of Iran	Iran	2005	BB-	9
Export Development Bank of Iran	Iran	2006	B+	8
Export Development Bank of Iran	Iran	2007	B+	8
Export Development Bank of Iran	Iran	2008	N/A	N/A
Export Development Bank of Iran	Iran	2009	N/A	N/A

Export Development Bank of Iran	Iran	2010	N/A	N/A
Export Development Bank of Iran	Iran	2011	N/A	N/A
Export Development Bank of Iran	Iran	2012	N/A	N/A
Bank Hapoalim B.M.	Israel	2000	N/A	N/A
Bank Hapoalim B.M.	Israel	2001	A-	15
Bank Hapoalim B.M.	Israel	2002	A-	15
Bank Hapoalim B.M.	Israel	2003	BBB+	14
Bank Hapoalim B.M.	Israel	2004	BBB+	14
Bank Hapoalim B.M.	Israel	2005	BBB+	14
Bank Hapoalim B.M.	Israel	2006	BBB+	14
Bank Hapoalim B.M.	Israel	2007	BBB+	14
Bank Hapoalim B.M.	Israel	2008	A-	15
Bank Hapoalim B.M.	Israel	2009	A-	15
Bank Hapoalim B.M.	Israel	2010	A-	15
Bank Hapoalim B.M.	Israel	2011	A-	15
Bank Hapoalim B.M.	Israel	2012	A-	15
Bank Leumi Le-Israel BM	Israel	2000	A-	15
Bank Leumi Le-Israel BM	Israel	2001	A-	15
Bank Leumi Le-Israel BM	Israel	2002	A-	15
Bank Leumi Le-Israel BM	Israel	2003	BBB+	14
Bank Leumi Le-Israel BM	Israel	2004	BBB+	14
Bank Leumi Le-Israel BM	Israel	2005	BBB+	14
Bank Leumi Le-Israel BM	Israel	2006	BBB+	14
Bank Leumi Le-Israel BM	Israel	2007	BBB+	14
Bank Leumi Le-Israel BM	Israel	2008	A-	15
Bank Leumi Le-Israel BM	Israel	2009	A-	15
Bank Leumi Le-Israel BM	Israel	2010	A-	15
Bank Leumi Le-Israel BM	Israel	2011	A-	15
Bank Leumi Le-Israel BM	Israel	2012	A-	15
First International Bank of Israel Ltd (The)	Israel	2000	N/A	N/A
First International Bank of Israel Ltd (The)	Israel	2001	A-	15
First International Bank of Israel Ltd (The)	Israel	2002	BBB	13
First International Bank of Israel Ltd (The)	Israel	2003	BBB	13
First International Bank of Israel Ltd (The)	Israel	2004	BBB	13
First International Bank of Israel Ltd (The)	Israel	2005	BBB	13
First International Bank of Israel Ltd (The)	Israel	2006	BBB	13
First International Bank of Israel Ltd (The)	Israel	2007	BBB	13
First International Bank of Israel Ltd (The)	Israel	2008	BBB+	14
First International Bank of Israel Ltd (The)	Israel	2009	BBB+	14
First International Bank of Israel Ltd (The)	Israel	2010	N/A	N/A
First International Bank of Israel Ltd (The)	Israel	2011	N/A	N/A
First International Bank of Israel Ltd (The)	Israel	2012	N/A	N/A
Arab Bank Australia Limited	Jordan	2000	N/A	N/A
Arab Bank Australia Limited	Jordan	2001	N/A	N/A
Arab Bank Australia Limited	Jordan	2002	N/A	N/A
Arab Bank Australia Limited	Jordan	2003	N/A	N/A
Arab Bank Australia Limited	Jordan	2004	BBB+	14
Arab Bank Australia Limited	Jordan	2005	BBB+	14
Arab Bank Australia Limited	Jordan	2006	A-	15
Arab Bank Australia Limited	Jordan	2007	A-	15
Arab Bank Australia Limited	Jordan	2008	A-	15
Arab Bank Australia Limited	Jordan	2009	A-	15
Arab Bank Australia Limited	Jordan	2010	A-	15
Arab Bank Australia Limited	Jordan	2011	A-	15

Arab Bank Australia Limited	Jordan	2012	A-	15
Arab Bank Plc	Jordan	2000	AA-	18
Arab Bank Plc	Jordan	2001	AA-	18
Arab Bank Plc	Jordan	2002	BBB+	14
Arab Bank Plc	Jordan	2003	BBB+	14
Arab Bank Plc	Jordan	2004	BBB+	14
Arab Bank Plc	Jordan	2005	BBB+	14
Arab Bank Plc	Jordan	2006	A-	15
Arab Bank Plc	Jordan	2007	A-	15
Arab Bank Plc	Jordan	2008	A-	15
Arab Bank Plc	Jordan	2009	A-	15
Arab Bank Plc	Jordan	2010	A-	15
Arab Bank Plc	Jordan	2011	A-	15
Arab Bank Plc	Jordan	2012	A-	15
Bank of Jordan	Jordan	2000	N/A	N/A
Bank of Jordan	Jordan	2001	N/A	N/A
Bank of Jordan	Jordan	2002	N/A	N/A
Bank of Jordan	Jordan	2003	N/A	N/A
Bank of Jordan	Jordan	2004	N/A	N/A
Bank of Jordan	Jordan	2005	BB-	9
Bank of Jordan	Jordan	2006	BB-	9
Bank of Jordan	Jordan	2007	BB-	9
Bank of Jordan	Jordan	2008	BB-	9
Bank of Jordan	Jordan	2009	BB-	9
Bank of Jordan	Jordan	2010	BB-	9
Bank of Jordan	Jordan	2011	BB-	9
Bank of Jordan	Jordan	2012	BB-	9
Housing Bank for Trade and Finance (The)	Jordan	2000	B+	8
Housing Bank for Trade and Finance (The)	Jordan	2001	BB-	9
Housing Bank for Trade and Finance (The)	Jordan	2002	BB-	9
Housing Bank for Trade and Finance (The)	Jordan	2003	BB	10
Housing Bank for Trade and Finance (The)	Jordan	2004	BB	10
Housing Bank for Trade and Finance (The)	Jordan	2005	N/A	N/A
Housing Bank for Trade and Finance (The)	Jordan	2006	N/A	N/A
Housing Bank for Trade and Finance (The)	Jordan	2007	N/A	N/A
Housing Bank for Trade and Finance (The)	Jordan	2008	N/A	N/A
Housing Bank for Trade and Finance (The)	Jordan	2009	N/A	N/A
Housing Bank for Trade and Finance (The)	Jordan	2010	N/A	N/A
Housing Bank for Trade and Finance (The)	Jordan	2011	N/A	N/A
Housing Bank for Trade and Finance (The)	Jordan	2012	N/A	N/A
Jordan Islamic Bank	Jordan	2000	N/A	N/A
Jordan Islamic Bank	Jordan	2001	N/A	N/A
Jordan Islamic Bank	Jordan	2002	N/A	N/A
Jordan Islamic Bank	Jordan	2003	N/A	N/A
Jordan Islamic Bank	Jordan	2004	N/A	N/A
Jordan Islamic Bank	Jordan	2005	N/A	N/A
Jordan Islamic Bank	Jordan	2006	N/A	N/A
Jordan Islamic Bank	Jordan	2007	N/A	N/A
Jordan Islamic Bank	Jordan	2008	BB-	9
Jordan Islamic Bank	Jordan	2009	BB-	9
Jordan Islamic Bank	Jordan	2010	BB-	9
Jordan Islamic Bank	Jordan	2011	BB-	9
Jordan Islamic Bank	Jordan	2012	BB-	9
Ahli United Bank KSC (Kuwait)	Kuwait	2000	N/A	N/A

Ahli United Bank KSC (Kuwait)	Kuwait	2001	N/A	N/A
Ahli United Bank KSC (Kuwait)	Kuwait	2002	N/A	N/A
Ahli United Bank KSC (Kuwait)	Kuwait	2003	N/A	N/A
Ahli United Bank KSC (Kuwait)	Kuwait	2004	BBB+	14
Ahli United Bank KSC (Kuwait)	Kuwait	2005	BBB+	14
Ahli United Bank KSC (Kuwait)	Kuwait	2006	A-	15
Ahli United Bank KSC (Kuwait)	Kuwait	2007	A-	15
Ahli United Bank KSC (Kuwait)	Kuwait	2008	A-	15
Ahli United Bank KSC (Kuwait)	Kuwait	2009	A-	15
Ahli United Bank KSC (Kuwait)	Kuwait	2010	A-	15
Ahli United Bank KSC (Kuwait)	Kuwait	2011	A-	15
Ahli United Bank KSC (Kuwait)	Kuwait	2012	A-	15
Al Ahli Bank of Kuwait	Kuwait	2000	N/A	N/A
Al Ahli Bank of Kuwait	Kuwait	2001	N/A	N/A
Al Ahli Bank of Kuwait	Kuwait	2002	N/A	N/A
Al Ahli Bank of Kuwait	Kuwait	2003	N/A	N/A
Al Ahli Bank of Kuwait	Kuwait	2004	BBB+	14
Al Ahli Bank of Kuwait	Kuwait	2005	BBB+	14
Al Ahli Bank of Kuwait	Kuwait	2006	A-	15
Al Ahli Bank of Kuwait	Kuwait	2007	A-	15
Al Ahli Bank of Kuwait	Kuwait	2008	A-	15
Al Ahli Bank of Kuwait	Kuwait	2009	A-	15
Al Ahli Bank of Kuwait	Kuwait	2010	A-	15
Al Ahli Bank of Kuwait	Kuwait	2011	A-	15
Al Ahli Bank of Kuwait	Kuwait	2012	A-	15
Commercial Bank of Kuwait	Kuwait	2000	N/A	N/A
Commercial Bank of Kuwait	Kuwait	2001	N/A	N/A
Commercial Bank of Kuwait	Kuwait	2002	A-	15
Commercial Bank of Kuwait	Kuwait	2003	A-	15
Commercial Bank of Kuwait	Kuwait	2004	A-	15
Commercial Bank of Kuwait	Kuwait	2005	A-	15
Commercial Bank of Kuwait	Kuwait	2006	A	16
Commercial Bank of Kuwait	Kuwait	2007	A	16
Commercial Bank of Kuwait	Kuwait	2008	A+	17
Commercial Bank of Kuwait	Kuwait	2009	A+	17
Commercial Bank of Kuwait	Kuwait	2010	A+	17
Commercial Bank of Kuwait	Kuwait	2011	A+	17
Commercial Bank of Kuwait	Kuwait	2012	A+	17
Gulf Bank	Kuwait	2000	N/A	N/A
Gulf Bank	Kuwait	2001	N/A	N/A
Gulf Bank	Kuwait	2002	A-	15
Gulf Bank	Kuwait	2003	A-	15
Gulf Bank	Kuwait	2004	A-	15
Gulf Bank	Kuwait	2005	A-	15
Gulf Bank	Kuwait	2006	A	16
Gulf Bank	Kuwait	2007	A	16
Gulf Bank	Kuwait	2008	A+	17
Gulf Bank	Kuwait	2009	A+	17
Gulf Bank	Kuwait	2010	A+	17
Gulf Bank	Kuwait	2011	A+	17
Gulf Bank	Kuwait	2012	A+	17
Gulf Invesment Corporation	Kuwait	2000	N/A	N/A
Gulf Invesment Corporation	Kuwait	2001	N/A	N/A
Gulf Invesment Corporation	Kuwait	2002	N/A	N/A

Gulf Invesment Corporation	Kuwait	2003	N/A	N/A
Gulf Invesment Corporation	Kuwait	2004	N/A	N/A
Gulf Invesment Corporation	Kuwait	2005	N/A	N/A
Gulf Invesment Corporation	Kuwait	2006	A	16
Gulf Invesment Corporation	Kuwait	2007	A	16
Gulf Invesment Corporation	Kuwait	2008	A	16
Gulf Invesment Corporation	Kuwait	2009	BBB	13
Gulf Invesment Corporation	Kuwait	2010	BBB	13
Gulf Invesment Corporation	Kuwait	2011	BBB	13
Gulf Invesment Corporation	Kuwait	2012	BBB	13
Industrial Bank of Kuwait	Kuwait	2000	N/A	N/A
Industrial Bank of Kuwait	Kuwait	2001	N/A	N/A
Industrial Bank of Kuwait	Kuwait	2002	N/A	N/A
Industrial Bank of Kuwait	Kuwait	2003	N/A	N/A
Industrial Bank of Kuwait	Kuwait	2004	N/A	N/A
Industrial Bank of Kuwait	Kuwait	2005	N/A	N/A
Industrial Bank of Kuwait	Kuwait	2006	A	16
Industrial Bank of Kuwait	Kuwait	2007	A	16
Industrial Bank of Kuwait	Kuwait	2008	A+	17
Industrial Bank of Kuwait	Kuwait	2009	A+	17
Industrial Bank of Kuwait	Kuwait	2010	A+	17
Industrial Bank of Kuwait	Kuwait	2011	A+	17
Industrial Bank of Kuwait	Kuwait	2012	A+	17
Kuwait Finance House	Kuwait	2000	N/A	N/A
Kuwait Finance House	Kuwait	2001	N/A	N/A
Kuwait Finance House	Kuwait	2002	BBB+	14
Kuwait Finance House	Kuwait	2003	BBB+	14
Kuwait Finance House	Kuwait	2004	A-	15
Kuwait Finance House	Kuwait	2005	A-	15
Kuwait Finance House	Kuwait	2006	A	16
Kuwait Finance House	Kuwait	2007	A	16
Kuwait Finance House	Kuwait	2008	A+	17
Kuwait Finance House	Kuwait	2009	A+	17
Kuwait Finance House	Kuwait	2010	A+	17
Kuwait Finance House	Kuwait	2011	A+	17
Kuwait Finance House	Kuwait	2012	A+	17
Kuwait International Bank	Kuwait	2000	N/A	N/A
Kuwait International Bank	Kuwait	2001	N/A	N/A
Kuwait International Bank	Kuwait	2002	N/A	N/A
Kuwait International Bank	Kuwait	2003	BBB+	14
Kuwait International Bank	Kuwait	2004	BBB+	14
Kuwait International Bank	Kuwait	2005	BBB+	14
Kuwait International Bank	Kuwait	2006	A-	15
Kuwait International Bank	Kuwait	2007	A-	15
Kuwait International Bank	Kuwait	2008	A-	15
Kuwait International Bank	Kuwait	2009	A-	15
Kuwait International Bank	Kuwait	2010	A-	15
Kuwait International Bank	Kuwait	2011	A-	15
Kuwait International Bank	Kuwait	2012	A-	15
Bank Audi S.A.L. Saradar Group	Lebanon	2000	N/A	N/A
Bank Audi S.A.L. Saradar Group	Lebanon	2001	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2002	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2003	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2004	B-	6

Bank Audi S.A.L. Saradar Group	Lebanon	2005	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2006	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2007	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2008	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2009	B-	6
Bank Audi S.A.L. Saradar Group	Lebanon	2010	B	7
Bank Audi S.A.L. Saradar Group	Lebanon	2011	B	7
Bank Audi S.A.L. Saradar Group	Lebanon	2012	B	7
Byblos Bank S.A.L.	Lebanon	2000	N/A	N/A
Byblos Bank S.A.L.	Lebanon	2001	B-	6
Byblos Bank S.A.L.	Lebanon	2002	B-	6
Byblos Bank S.A.L.	Lebanon	2003	B-	6
Byblos Bank S.A.L.	Lebanon	2004	B-	6
Byblos Bank S.A.L.	Lebanon	2005	B-	6
Byblos Bank S.A.L.	Lebanon	2006	B-	6
Byblos Bank S.A.L.	Lebanon	2007	B-	6
Byblos Bank S.A.L.	Lebanon	2008	B-	6
Byblos Bank S.A.L.	Lebanon	2009	B-	6
Byblos Bank S.A.L.	Lebanon	2010	B	7
Byblos Bank S.A.L.	Lebanon	2011	B	7
Byblos Bank S.A.L.	Lebanon	2012	B	7
Attijariwafa Bank	Morocco	2000	N/A	N/A
Attijariwafa Bank	Morocco	2001	N/A	N/A
Attijariwafa Bank	Morocco	2002	N/A	N/A
Attijariwafa Bank	Morocco	2003	N/A	N/A
Attijariwafa Bank	Morocco	2004	N/A	N/A
Attijariwafa Bank	Morocco	2005	N/A	N/A
Attijariwafa Bank	Morocco	2006	N/A	N/A
Attijariwafa Bank	Morocco	2007	BB+	11
Attijariwafa Bank	Morocco	2008	BB+	11
Attijariwafa Bank	Morocco	2009	BB+	11
Attijariwafa Bank	Morocco	2010	BB+	11
Attijariwafa Bank	Morocco	2011	BB+	11
Attijariwafa Bank	Morocco	2012	BB+	11
BMCE Bank	Morocco	2000	BB	10
BMCE Bank	Morocco	2001	BB	10
BMCE Bank	Morocco	2002	BB	10
BMCE Bank	Morocco	2003	N/A	N/A
BMCE Bank	Morocco	2004	N/A	N/A
BMCE Bank	Morocco	2005	N/A	N/A
BMCE Bank	Morocco	2006	N/A	N/A
BMCE Bank	Morocco	2007	N/A	N/A
BMCE Bank	Morocco	2008	N/A	N/A
BMCE Bank	Morocco	2009	N/A	N/A
BMCE Bank	Morocco	2010	N/A	N/A
BMCE Bank	Morocco	2011	N/A	N/A
BMCE Bank	Morocco	2012	N/A	N/A
AHLI Bank SAOG	Oman	2000	N/A	N/A
AHLI Bank SAOG	Oman	2001	N/A	N/A
AHLI Bank SAOG	Oman	2002	N/A	N/A
AHLI Bank SAOG	Oman	2003	N/A	N/A
AHLI Bank SAOG	Oman	2004	N/A	N/A
AHLI Bank SAOG	Oman	2005	N/A	N/A
AHLI Bank SAOG	Oman	2006	N/A	N/A

AHLI Bank SAOG	Oman	2007	N/A	N/A
AHLI Bank SAOG	Oman	2008	N/A	N/A
AHLI Bank SAOG	Oman	2009	N/A	N/A
AHLI Bank SAOG	Oman	2010	BBB+	14
AHLI Bank SAOG	Oman	2011	BBB+	14
AHLI Bank SAOG	Oman	2012	BBB+	14
Bank Dhofar SAOG	Oman	2000	BBB-	12
Bank Dhofar SAOG	Oman	2001	BBB-	12
Bank Dhofar SAOG	Oman	2002	BBB-	12
Bank Dhofar SAOG	Oman	2003	BBB-	12
Bank Dhofar SAOG	Oman	2004	BBB-	12
Bank Dhofar SAOG	Oman	2005	BBB	13
Bank Dhofar SAOG	Oman	2006	BBB+	14
Bank Dhofar SAOG	Oman	2007	BBB+	14
Bank Dhofar SAOG	Oman	2008	BBB+	14
Bank Dhofar SAOG	Oman	2009	BBB+	14
Bank Dhofar SAOG	Oman	2010	BBB+	14
Bank Dhofar SAOG	Oman	2011	BBB+	14
Bank Dhofar SAOG	Oman	2012	BBB+	14
Bank Muscat SAOG	Oman	2000	BBB-	12
Bank Muscat SAOG	Oman	2001	BBB-	12
Bank Muscat SAOG	Oman	2002	BBB-	12
Bank Muscat SAOG	Oman	2003	BBB-	12
Bank Muscat SAOG	Oman	2004	BBB	13
Bank Muscat SAOG	Oman	2005	BBB	13
Bank Muscat SAOG	Oman	2006	A-	15
Bank Muscat SAOG	Oman	2007	A-	15
Bank Muscat SAOG	Oman	2008	A-	15
Bank Muscat SAOG	Oman	2009	A-	15
Bank Muscat SAOG	Oman	2010	A-	15
Bank Muscat SAOG	Oman	2011	A-	15
Bank Muscat SAOG	Oman	2012	A-	15
Bank Sohar	Oman	2000	N/A	N/A
Bank Sohar	Oman	2001	N/A	N/A
Bank Sohar	Oman	2002	N/A	N/A
Bank Sohar	Oman	2003	N/A	N/A
Bank Sohar	Oman	2004	N/A	N/A
Bank Sohar	Oman	2005	N/A	N/A
Bank Sohar	Oman	2006	N/A	N/A
Bank Sohar	Oman	2007	N/A	N/A
Bank Sohar	Oman	2008	N/A	N/A
Bank Sohar	Oman	2009	N/A	N/A
Bank Sohar	Oman	2010	BBB+	14
Bank Sohar	Oman	2011	BBB+	14
Bank Sohar	Oman	2012	BBB+	14
HSBC Bank Oman	Oman	2000	N/A	N/A
HSBC Bank Oman	Oman	2001	BBB-	12
HSBC Bank Oman	Oman	2002	BBB-	12
HSBC Bank Oman	Oman	2003	BBB-	12
HSBC Bank Oman	Oman	2004	BBB-	12
HSBC Bank Oman	Oman	2005	BBB-	12
HSBC Bank Oman	Oman	2006	BBB+	14
HSBC Bank Oman	Oman	2007	BBB+	14
HSBC Bank Oman	Oman	2008	BBB+	14

HSBC Bank Oman	Oman	2009	BBB+	14
HSBC Bank Oman	Oman	2010	BBB+	14
HSBC Bank Oman	Oman	2011	BBB+	14
HSBC Bank Oman	Oman	2012	A+	17
National Bank of Oman	Oman	2000	N/A	N/A
National Bank of Oman	Oman	2001	N/A	N/A
National Bank of Oman	Oman	2002	N/A	N/A
National Bank of Oman	Oman	2003	N/A	N/A
National Bank of Oman	Oman	2004	N/A	N/A
National Bank of Oman	Oman	2005	N/A	N/A
National Bank of Oman	Oman	2006	N/A	N/A
National Bank of Oman	Oman	2007	N/A	N/A
National Bank of Oman	Oman	2008	N/A	N/A
National Bank of Oman	Oman	2009	N/A	N/A
National Bank of Oman	Oman	2010	N/A	N/A
National Bank of Oman	Oman	2011	BBB+	14
National Bank of Oman	Oman	2012	BBB+	14
Oman Arab Bank	Oman	2000	N/A	N/A
Oman Arab Bank	Oman	2001	N/A	N/A
Oman Arab Bank	Oman	2002	N/A	N/A
Oman Arab Bank	Oman	2003	BBB-	12
Oman Arab Bank	Oman	2004	BBB-	12
Oman Arab Bank	Oman	2005	BBB	13
Oman Arab Bank	Oman	2006	BBB+	14
Oman Arab Bank	Oman	2007	BBB+	14
Oman Arab Bank	Oman	2008	BBB+	14
Oman Arab Bank	Oman	2009	N/A	N/A
Oman Arab Bank	Oman	2010	N/A	N/A
Oman Arab Bank	Oman	2011	N/A	N/A
Oman Arab Bank	Oman	2012	N/A	N/A
Ahli Bank QSC	Qatar	2000	N/A	N/A
Ahli Bank QSC	Qatar	2001	N/A	N/A
Ahli Bank QSC	Qatar	2002	N/A	N/A
Ahli Bank QSC	Qatar	2003	N/A	N/A
Ahli Bank QSC	Qatar	2004	N/A	N/A
Ahli Bank QSC	Qatar	2005	N/A	N/A
Ahli Bank QSC	Qatar	2006	N/A	N/A
Ahli Bank QSC	Qatar	2007	BBB+	14
Ahli Bank QSC	Qatar	2008	A-	15
Ahli Bank QSC	Qatar	2009	A-	15
Ahli Bank QSC	Qatar	2010	A-	15
Ahli Bank QSC	Qatar	2011	A-	15
Ahli Bank QSC	Qatar	2012	A-	15
Commercial Bank of Qatar	Qatar	2000	N/A	N/A
Commercial Bank of Qatar	Qatar	2001	N/A	N/A
Commercial Bank of Qatar	Qatar	2002	N/A	N/A
Commercial Bank of Qatar	Qatar	2003	BBB+	14
Commercial Bank of Qatar	Qatar	2004	BBB+	14
Commercial Bank of Qatar	Qatar	2005	BBB+	14
Commercial Bank of Qatar	Qatar	2006	A	16
Commercial Bank of Qatar	Qatar	2007	A	16
Commercial Bank of Qatar	Qatar	2008	A	16
Commercial Bank of Qatar	Qatar	2009	A	16
Commercial Bank of Qatar	Qatar	2010	A	16

Commercial Bank of Qatar	Qatar	2011	A	16
Commercial Bank of Qatar	Qatar	2012	A	16
Doha Bank QSC	Qatar	2000	N/A	N/A
Doha Bank QSC	Qatar	2001	N/A	N/A
Doha Bank QSC	Qatar	2002	N/A	N/A
Doha Bank QSC	Qatar	2003	N/A	N/A
Doha Bank QSC	Qatar	2004	N/A	N/A
Doha Bank QSC	Qatar	2005	N/A	N/A
Doha Bank QSC	Qatar	2006	N/A	N/A
Doha Bank QSC	Qatar	2007	N/A	N/A
Doha Bank QSC	Qatar	2008	A	16
Doha Bank QSC	Qatar	2009	A	16
Doha Bank QSC	Qatar	2010	A	16
Doha Bank QSC	Qatar	2011	A	16
Doha Bank QSC	Qatar	2012	A	16
Qatar International Islamic Bank	Qatar	2000	N/A	N/A
Qatar International Islamic Bank	Qatar	2001	N/A	N/A
Qatar International Islamic Bank	Qatar	2002	N/A	N/A
Qatar International Islamic Bank	Qatar	2003	N/A	N/A
Qatar International Islamic Bank	Qatar	2004	N/A	N/A
Qatar International Islamic Bank	Qatar	2005	N/A	N/A
Qatar International Islamic Bank	Qatar	2006	N/A	N/A
Qatar International Islamic Bank	Qatar	2007	N/A	N/A
Qatar International Islamic Bank	Qatar	2008	N/A	N/A
Qatar International Islamic Bank	Qatar	2009	N/A	N/A
Qatar International Islamic Bank	Qatar	2010	N/A	N/A
Qatar International Islamic Bank	Qatar	2011	A-	15
Qatar International Islamic Bank	Qatar	2012	A-	15
Qatar Islamic Bank SAQ	Qatar	2000	N/A	N/A
Qatar Islamic Bank SAQ	Qatar	2001	N/A	N/A
Qatar Islamic Bank SAQ	Qatar	2002	N/A	N/A
Qatar Islamic Bank SAQ	Qatar	2003	N/A	N/A
Qatar Islamic Bank SAQ	Qatar	2004	BBB	13
Qatar Islamic Bank SAQ	Qatar	2005	BBB	13
Qatar Islamic Bank SAQ	Qatar	2006	A-	15
Qatar Islamic Bank SAQ	Qatar	2007	A-	15
Qatar Islamic Bank SAQ	Qatar	2008	A	16
Qatar Islamic Bank SAQ	Qatar	2009	A	16
Qatar Islamic Bank SAQ	Qatar	2010	A	16
Qatar Islamic Bank SAQ	Qatar	2011	A	16
Qatar Islamic Bank SAQ	Qatar	2012	A	16
Qatar National Bank	Qatar	2000	BBB	13
Qatar National Bank	Qatar	2001	BBB+	14
Qatar National Bank	Qatar	2002	A-	15
Qatar National Bank	Qatar	2003	A-	15
Qatar National Bank	Qatar	2004	A-	15
Qatar National Bank	Qatar	2005	A-	15
Qatar National Bank	Qatar	2006	A+	17
Qatar National Bank	Qatar	2007	A+	17
Qatar National Bank	Qatar	2008	A+	17
Qatar National Bank	Qatar	2009	A+	17
Qatar National Bank	Qatar	2010	A+	17
Qatar National Bank	Qatar	2011	A+	17
Qatar National Bank	Qatar	2012	A+	17

Al Rajhi Banking and Investment Corporation	Saudi Arabia	2000	BBB+	14
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2001	BBB+	14
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2002	BBB+	14
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2003	BBB+	14
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2004	BBB+	14
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2005	BBB+	14
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2006	A	16
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2007	A	16
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2008	A+	17
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2009	A+	17
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2010	A+	17
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2011	A+	17
Al Rajhi Banking and Investment Corporation	Saudi Arabia	2012	A+	17
Alinma Bank	Saudi Arabia	2000	N/A	N/A
Alinma Bank	Saudi Arabia	2001	N/A	N/A
Alinma Bank	Saudi Arabia	2002	N/A	N/A
Alinma Bank	Saudi Arabia	2003	N/A	N/A
Alinma Bank	Saudi Arabia	2004	N/A	N/A
Alinma Bank	Saudi Arabia	2005	N/A	N/A
Alinma Bank	Saudi Arabia	2006	N/A	N/A
Alinma Bank	Saudi Arabia	2007	N/A	N/A
Alinma Bank	Saudi Arabia	2008	N/A	N/A
Alinma Bank	Saudi Arabia	2009	N/A	N/A
Alinma Bank	Saudi Arabia	2010	N/A	N/A
Alinma Bank	Saudi Arabia	2011	N/A	N/A
Alinma Bank	Saudi Arabia	2012	A-	15
Arab National Bank	Saudi Arabia	2000	N/A	N/A
Arab National Bank	Saudi Arabia	2001	BBB	13
Arab National Bank	Saudi Arabia	2002	BBB	13
Arab National Bank	Saudi Arabia	2003	BBB+	14
Arab National Bank	Saudi Arabia	2004	BBB+	14
Arab National Bank	Saudi Arabia	2005	A-	15
Arab National Bank	Saudi Arabia	2006	A-	15
Arab National Bank	Saudi Arabia	2007	A	16
Arab National Bank	Saudi Arabia	2008	A	16
Arab National Bank	Saudi Arabia	2009	A	16
Arab National Bank	Saudi Arabia	2010	A	16
Arab National Bank	Saudi Arabia	2011	A	16
Arab National Bank	Saudi Arabia	2012	A	16
Bank Al-Jazira	Saudi Arabia	2000	N/A	N/A
Bank Al-Jazira	Saudi Arabia	2001	BBB-	12
Bank Al-Jazira	Saudi Arabia	2002	BBB-	12
Bank Al-Jazira	Saudi Arabia	2003	BBB-	12
Bank Al-Jazira	Saudi Arabia	2004	BBB-	12
Bank Al-Jazira	Saudi Arabia	2005	BBB-	12
Bank Al-Jazira	Saudi Arabia	2006	BBB+	14
Bank Al-Jazira	Saudi Arabia	2007	BBB+	14
Bank Al-Jazira	Saudi Arabia	2008	A-	15
Bank Al-Jazira	Saudi Arabia	2009	A-	15
Bank Al-Jazira	Saudi Arabia	2010	A-	15
Bank Al-Jazira	Saudi Arabia	2011	A-	15
Bank Al-Jazira	Saudi Arabia	2012	A-	15
Banque Saudi Fransi	Saudi Arabia	2000	N/A	N/A
Banque Saudi Fransi	Saudi Arabia	2001	BBB+	14

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Banque Saudi Fransi	Saudi Arabia	2002	BBB+	14
Banque Saudi Fransi	Saudi Arabia	2003	A-	15
Banque Saudi Fransi	Saudi Arabia	2004	A-	15
Banque Saudi Fransi	Saudi Arabia	2005	A	16
Banque Saudi Fransi	Saudi Arabia	2006	A	16
Banque Saudi Fransi	Saudi Arabia	2007	A	16
Banque Saudi Fransi	Saudi Arabia	2008	A	16
Banque Saudi Fransi	Saudi Arabia	2009	A	16
Banque Saudi Fransi	Saudi Arabia	2010	A	16
Banque Saudi Fransi	Saudi Arabia	2011	A	16
Banque Saudi Fransi	Saudi Arabia	2012	A	16
National Commercial Bank (The)	Saudi Arabia	2000	N/A	N/A
National Commercial Bank (The)	Saudi Arabia	2001	BBB	13
National Commercial Bank (The)	Saudi Arabia	2002	BBB	13
National Commercial Bank (The)	Saudi Arabia	2003	BBB	13
National Commercial Bank (The)	Saudi Arabia	2004	BBB	13
National Commercial Bank (The)	Saudi Arabia	2005	A	16
National Commercial Bank (The)	Saudi Arabia	2006	A	16
National Commercial Bank (The)	Saudi Arabia	2007	A	16
National Commercial Bank (The)	Saudi Arabia	2008	A+	17
National Commercial Bank (The)	Saudi Arabia	2009	A+	17
National Commercial Bank (The)	Saudi Arabia	2010	A+	17
National Commercial Bank (The)	Saudi Arabia	2011	A+	17
National Commercial Bank (The)	Saudi Arabia	2012	A+	17
Riyad Bank	Saudi Arabia	2000	N/A	N/A
Riyad Bank	Saudi Arabia	2001	BBB+	14
Riyad Bank	Saudi Arabia	2002	BBB+	14
Riyad Bank	Saudi Arabia	2003	A-	15
Riyad Bank	Saudi Arabia	2004	A-	15
Riyad Bank	Saudi Arabia	2005	A	16
Riyad Bank	Saudi Arabia	2006	A	16
Riyad Bank	Saudi Arabia	2007	A	16
Riyad Bank	Saudi Arabia	2008	A+	17
Riyad Bank	Saudi Arabia	2009	A+	17
Riyad Bank	Saudi Arabia	2010	A+	17
Riyad Bank	Saudi Arabia	2011	A+	17
Riyad Bank	Saudi Arabia	2012	A+	17
Samba Financial Group	Saudi Arabia	2000	BBB+	14
Samba Financial Group	Saudi Arabia	2001	BBB+	14
Samba Financial Group	Saudi Arabia	2002	BBB+	14
Samba Financial Group	Saudi Arabia	2003	A-	15
Samba Financial Group	Saudi Arabia	2004	A-	15
Samba Financial Group	Saudi Arabia	2005	A	16
Samba Financial Group	Saudi Arabia	2006	A	16
Samba Financial Group	Saudi Arabia	2007	A	16
Samba Financial Group	Saudi Arabia	2008	A+	17
Samba Financial Group	Saudi Arabia	2009	A+	17
Samba Financial Group	Saudi Arabia	2010	A+	17
Samba Financial Group	Saudi Arabia	2011	A+	17
Samba Financial Group	Saudi Arabia	2012	A+	17
Saudi British Bank	Saudi Arabia	2000	N/A	N/A
Saudi British Bank	Saudi Arabia	2001	BBB+	14
Saudi British Bank	Saudi Arabia	2002	BBB+	14
Saudi British Bank	Saudi Arabia	2003	A-	15

Saudi British Bank	Saudi Arabia	2004	A-	15
Saudi British Bank	Saudi Arabia	2005	A	16
Saudi British Bank	Saudi Arabia	2006	A	16
Saudi British Bank	Saudi Arabia	2007	A	16
Saudi British Bank	Saudi Arabia	2008	A	16
Saudi British Bank	Saudi Arabia	2009	A	16
Saudi British Bank	Saudi Arabia	2010	A	16
Saudi British Bank	Saudi Arabia	2011	A	16
Saudi British Bank	Saudi Arabia	2012	A	16
Saudi Hollandi Bank	Saudi Arabia	2000	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2001	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2002	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2003	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2004	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2005	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2006	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2007	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2008	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2009	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2010	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2011	BBB+	14
Saudi Hollandi Bank	Saudi Arabia	2012	BBB+	14
Saudi Investment Bank	Saudi Arabia	2000	N/A	N/A
Saudi Investment Bank	Saudi Arabia	2001	N/A	N/A
Saudi Investment Bank	Saudi Arabia	2002	N/A	N/A
Saudi Investment Bank	Saudi Arabia	2003	N/A	N/A
Saudi Investment Bank	Saudi Arabia	2004	N/A	N/A
Saudi Investment Bank	Saudi Arabia	2005	N/A	N/A
Saudi Investment Bank	Saudi Arabia	2006	A-	15
Saudi Investment Bank	Saudi Arabia	2007	A-	15
Saudi Investment Bank	Saudi Arabia	2008	A-	15
Saudi Investment Bank	Saudi Arabia	2009	A-	15
Saudi Investment Bank	Saudi Arabia	2010	A-	15
Saudi Investment Bank	Saudi Arabia	2011	A-	15
Saudi Investment Bank	Saudi Arabia	2012	A-	15
Arab Tunisian Bank	Tunisia	2000	N/A	N/A
Arab Tunisian Bank	Tunisia	2001	N/A	N/A
Arab Tunisian Bank	Tunisia	2002	N/A	N/A
Arab Tunisian Bank	Tunisia	2003	N/A	N/A
Arab Tunisian Bank	Tunisia	2004	BBB-	12
Arab Tunisian Bank	Tunisia	2005	BBB-	12
Arab Tunisian Bank	Tunisia	2006	BBB	13
Arab Tunisian Bank	Tunisia	2007	BBB+	14
Arab Tunisian Bank	Tunisia	2008	BBB+	14
Arab Tunisian Bank	Tunisia	2009	BBB+	14
Arab Tunisian Bank	Tunisia	2010	BBB+	14
Arab Tunisian Bank	Tunisia	2011	BBB	13
Arab Tunisian Bank	Tunisia	2012	BBB-	12
Banque de Tunisie et des Emirates S.A.	Tunisia	2000	N/A	N/A
Banque de Tunisie et des Emirates S.A.	Tunisia	2001	BB+	11
Banque de Tunisie et des Emirates S.A.	Tunisia	2002	BB+	11
Banque de Tunisie et des Emirates S.A.	Tunisia	2003	BB+	11
Banque de Tunisie et des Emirates S.A.	Tunisia	2004	BBB-	12
Banque de Tunisie et des Emirates S.A.	Tunisia	2005	BBB-	12

Banque de Tunisie et des Emirates S.A.	Tunisia	2006	BBB-	12
Banque de Tunisie et des Emirates S.A.	Tunisia	2007	N/A	N/A
Banque de Tunisie et des Emirates S.A.	Tunisia	2008	N/A	N/A
Banque de Tunisie et des Emirates S.A.	Tunisia	2009	N/A	N/A
Banque de Tunisie et des Emirates S.A.	Tunisia	2010	N/A	N/A
Banque de Tunisie et des Emirates S.A.	Tunisia	2011	N/A	N/A
Banque de Tunisie et des Emirates S.A.	Tunisia	2012	N/A	N/A
Akbank TAS	Turkey	2000	BB-	9
Akbank TAS	Turkey	2001	B	7
Akbank TAS	Turkey	2002	B	7
Akbank TAS	Turkey	2003	B	7
Akbank TAS	Turkey	2004	B+	8
Akbank TAS	Turkey	2005	BB-	9
Akbank TAS	Turkey	2006	BB	10
Akbank TAS	Turkey	2007	BB	10
Akbank TAS	Turkey	2008	BB	10
Akbank TAS	Turkey	2009	BBB-	12
Akbank TAS	Turkey	2010	BBB-	12
Akbank TAS	Turkey	2011	BBB-	12
Akbank TAS	Turkey	2012	BBB	13
Albaraka Turk Katilim Bankasi A.S.	Turkey	2000	N/A	N/A
Albaraka Turk Katilim Bankasi A.S.	Turkey	2001	N/A	N/A
Albaraka Turk Katilim Bankasi A.S.	Turkey	2002	N/A	N/A
Albaraka Turk Katilim Bankasi A.S.	Turkey	2003	N/A	N/A
Albaraka Turk Katilim Bankasi A.S.	Turkey	2004	N/A	N/A
Albaraka Turk Katilim Bankasi A.S.	Turkey	2005	B	7
Albaraka Turk Katilim Bankasi A.S.	Turkey	2006	B	7
Albaraka Turk Katilim Bankasi A.S.	Turkey	2007	BB-	9
Albaraka Turk Katilim Bankasi A.S.	Turkey	2008	BB-	9
Albaraka Turk Katilim Bankasi A.S.	Turkey	2009	BB-	9
Albaraka Turk Katilim Bankasi A.S.	Turkey	2010	B+	8
Albaraka Turk Katilim Bankasi A.S.	Turkey	2011	N/A	N/A
Albaraka Turk Katilim Bankasi A.S.	Turkey	2012	N/A	N/A
Alternatifbank AS	Turkey	2000	N/A	N/A
Alternatifbank AS	Turkey	2001	N/A	N/A
Alternatifbank AS	Turkey	2002	N/A	N/A
Alternatifbank AS	Turkey	2003	N/A	N/A
Alternatifbank AS	Turkey	2004	N/A	N/A
Alternatifbank AS	Turkey	2005	B+	8
Alternatifbank AS	Turkey	2006	B+	8
Alternatifbank AS	Turkey	2007	BB-	9
Alternatifbank AS	Turkey	2008	BB-	9
Alternatifbank AS	Turkey	2009	BB	10
Alternatifbank AS	Turkey	2010	BB	10
Alternatifbank AS	Turkey	2011	BB	10
Alternatifbank AS	Turkey	2012	BB	10
Anadolubank AS	Turkey	2000	N/A	N/A
Anadolubank AS	Turkey	2001	N/A	N/A
Anadolubank AS	Turkey	2002	N/A	N/A
Anadolubank AS	Turkey	2003	B-	6
Anadolubank AS	Turkey	2004	B	7
Anadolubank AS	Turkey	2005	B+	8
Anadolubank AS	Turkey	2006	B+	8
Anadolubank AS	Turkey	2007	BB-	9

Anadolubank AS	Turkey	2008	BB-	9
Anadolubank AS	Turkey	2009	BB-	9
Anadolubank AS	Turkey	2010	BB	10
Anadolubank AS	Turkey	2011	BB	10
Anadolubank AS	Turkey	2012	BB	10
Arab Turkish Bank	Turkey	2000	N/A	N/A
Arab Turkish Bank	Turkey	2001	N/A	N/A
Arab Turkish Bank	Turkey	2002	N/A	N/A
Arab Turkish Bank	Turkey	2003	N/A	N/A
Arab Turkish Bank	Turkey	2004	B	7
Arab Turkish Bank	Turkey	2005	B	7
Arab Turkish Bank	Turkey	2006	B	7
Arab Turkish Bank	Turkey	2007	N/A	N/A
Arab Turkish Bank	Turkey	2008	N/A	N/A
Arab Turkish Bank	Turkey	2009	N/A	N/A
Arab Turkish Bank	Turkey	2010	N/A	N/A
Arab Turkish Bank	Turkey	2011	N/A	N/A
Arab Turkish Bank	Turkey	2012	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2000	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2001	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2002	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2003	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2004	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2005	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2006	N/A	N/A
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2007	BB	10
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2008	BB	10
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2009	BBB-	12
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2010	BBB-	12
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2011	BBB-	12
Baqnkpozitif Kredi ve Kalkinma Bankasi AS	Turkey	2012	BBB-	12
Banque de Commerce et de Placements S.A.	Turkey	2000	N/A	N/A
Banque de Commerce et de Placements S.A.	Turkey	2001	N/A	N/A
Banque de Commerce et de Placements S.A.	Turkey	2002	N/A	N/A
Banque de Commerce et de Placements S.A.	Turkey	2003	N/A	N/A
Banque de Commerce et de Placements S.A.	Turkey	2004	N/A	N/A
Banque de Commerce et de Placements S.A.	Turkey	2005	N/A	N/A
Banque de Commerce et de Placements S.A.	Turkey	2006	BB+	11
Banque de Commerce et de Placements S.A.	Turkey	2007	BB+	11
Banque de Commerce et de Placements S.A.	Turkey	2008	BB+	11
Banque de Commerce et de Placements S.A.	Turkey	2009	BB+	11
Banque de Commerce et de Placements S.A.	Turkey	2010	BBB-	12
Banque de Commerce et de Placements S.A.	Turkey	2011	BBB-	12
Banque de Commerce et de Placements S.A.	Turkey	2012	BBB-	12
Burgan Bank AS	Turkey	2000	N/A	N/A
Burgan Bank AS	Turkey	2001	N/A	N/A
Burgan Bank AS	Turkey	2002	B-	6
Burgan Bank AS	Turkey	2003	B-	6
Burgan Bank AS	Turkey	2004	B	7
Burgan Bank AS	Turkey	2005	B	7
Burgan Bank AS	Turkey	2006	N/A	N/A
Burgan Bank AS	Turkey	2007	N/A	N/A
Burgan Bank AS	Turkey	2008	N/A	N/A
Burgan Bank AS	Turkey	2009	N/A	N/A

Burgan Bank AS	Turkey	2010	N/A	N/A
Burgan Bank AS	Turkey	2011	N/A	N/A
Burgan Bank AS	Turkey	2012	N/A	N/A
Cellco Finance N.V.	Turkey	2000	BB-	9
Cellco Finance N.V.	Turkey	2001	BB-	9
Cellco Finance N.V.	Turkey	2002	B-	6
Cellco Finance N.V.	Turkey	2003	B	7
Cellco Finance N.V.	Turkey	2004	B+	8
Cellco Finance N.V.	Turkey	2005	BB-	9
Cellco Finance N.V.	Turkey	2006	N/A	N/A
Cellco Finance N.V.	Turkey	2007	N/A	N/A
Cellco Finance N.V.	Turkey	2008	N/A	N/A
Cellco Finance N.V.	Turkey	2009	N/A	N/A
Cellco Finance N.V.	Turkey	2010	N/A	N/A
Cellco Finance N.V.	Turkey	2011	N/A	N/A
Cellco Finance N.V.	Turkey	2012	N/A	N/A
Demir Halk Bank	Turkey	2000	N/A	N/A
Demir Halk Bank	Turkey	2001	N/A	N/A
Demir Halk Bank	Turkey	2002	BB-	9
Demir Halk Bank	Turkey	2003	BB-	9
Demir Halk Bank	Turkey	2004	BB-	9
Demir Halk Bank	Turkey	2005	BB	10
Demir Halk Bank	Turkey	2006	BB	10
Demir Halk Bank	Turkey	2007	N/A	N/A
Demir Halk Bank	Turkey	2008	N/A	N/A
Demir Halk Bank	Turkey	2009	N/A	N/A
Demir Halk Bank	Turkey	2010	N/A	N/A
Demir Halk Bank	Turkey	2011	N/A	N/A
Demir Halk Bank	Turkey	2012	N/A	N/A
Denizbank AS	Turkey	2000	N/A	N/A
Denizbank AS	Turkey	2001	N/A	N/A
Denizbank AS	Turkey	2002	B	7
Denizbank AS	Turkey	2003	B	7
Denizbank AS	Turkey	2004	B+	8
Denizbank AS	Turkey	2005	BB-	9
Denizbank AS	Turkey	2006	BB	10
Denizbank AS	Turkey	2007	BB	10
Denizbank AS	Turkey	2008	BB	10
Denizbank AS	Turkey	2009	BBB-	12
Denizbank AS	Turkey	2010	BBB-	12
Denizbank AS	Turkey	2011	BBB-	12
Denizbank AS	Turkey	2012	BBB-	12
Dogus Holding AS	Turkey	2000	N/A	N/A
Dogus Holding AS	Turkey	2001	B	7
Dogus Holding AS	Turkey	2002	B	7
Dogus Holding AS	Turkey	2003	B	7
Dogus Holding AS	Turkey	2004	B+	8
Dogus Holding AS	Turkey	2005	B+	8
Dogus Holding AS	Turkey	2006	BB-	9
Dogus Holding AS	Turkey	2007	BB-	9
Dogus Holding AS	Turkey	2008	BB-	9
Dogus Holding AS	Turkey	2009	BB-	9
Dogus Holding AS	Turkey	2010	BB-	9
Dogus Holding AS	Turkey	2011	N/A	N/A

Dogus Holding AS	Turkey	2012	N/A	N/A
Finansbank AS	Turkey	2000	BB-	9
Finansbank AS	Turkey	2001	B	7
Finansbank AS	Turkey	2002	B-	6
Finansbank AS	Turkey	2003	B	7
Finansbank AS	Turkey	2004	B+	8
Finansbank AS	Turkey	2005	BB-	9
Finansbank AS	Turkey	2006	BB	10
Finansbank AS	Turkey	2007	BB	10
Finansbank AS	Turkey	2008	BB	10
Finansbank AS	Turkey	2009	BBB-	12
Finansbank AS	Turkey	2010	BBB-	12
Finansbank AS	Turkey	2011	BBB-	12
Finansbank AS	Turkey	2012	BBB-	12
Fortis Bank AS	Turkey	2000	N/A	N/A
Fortis Bank AS	Turkey	2001	B	7
Fortis Bank AS	Turkey	2002	B	7
Fortis Bank AS	Turkey	2003	B	7
Fortis Bank AS	Turkey	2004	B+	8
Fortis Bank AS	Turkey	2005	BB-	9
Fortis Bank AS	Turkey	2006	BB	10
Fortis Bank AS	Turkey	2007	N/A	N/A
Fortis Bank AS	Turkey	2008	N/A	N/A
Fortis Bank AS	Turkey	2009	N/A	N/A
Fortis Bank AS	Turkey	2010	N/A	N/A
Fortis Bank AS	Turkey	2011	N/A	N/A
Fortis Bank AS	Turkey	2012	N/A	N/A
Garanti Factoring	Turkey	2000	N/A	N/A
Garanti Factoring	Turkey	2001	N/A	N/A
Garanti Factoring	Turkey	2002	B	7
Garanti Factoring	Turkey	2003	B	7
Garanti Factoring	Turkey	2004	B+	8
Garanti Factoring	Turkey	2005	BB-	9
Garanti Factoring	Turkey	2006	BB	10
Garanti Factoring	Turkey	2007	BB	10
Garanti Factoring	Turkey	2008	BB	10
Garanti Factoring	Turkey	2009	BBB-	12
Garanti Factoring	Turkey	2010	BBB-	12
Garanti Factoring	Turkey	2011	N/A	N/A
Garanti Factoring	Turkey	2012	N/A	N/A
Garanti Finansal Kiralama AS	Turkey	2000	N/A	N/A
Garanti Finansal Kiralama AS	Turkey	2001	B	7
Garanti Finansal Kiralama AS	Turkey	2002	B	7
Garanti Finansal Kiralama AS	Turkey	2003	B	7
Garanti Finansal Kiralama AS	Turkey	2004	B+	8
Garanti Finansal Kiralama AS	Turkey	2005	BB-	9
Garanti Finansal Kiralama AS	Turkey	2006	BB	10
Garanti Finansal Kiralama AS	Turkey	2007	BB	10
Garanti Finansal Kiralama AS	Turkey	2008	BB	10
Garanti Finansal Kiralama AS	Turkey	2009	BBB-	12
Garanti Finansal Kiralama AS	Turkey	2010	BBB-	12
Garanti Finansal Kiralama AS	Turkey	2011	BBB-	12
Garanti Finansal Kiralama AS	Turkey	2012	BBB	13
HSBC Bank AS	Turkey	2000	B+	8

HSBC Bank AS	Turkey	2001	B-	6
HSBC Bank AS	Turkey	2002	B	7
HSBC Bank AS	Turkey	2003	B	7
HSBC Bank AS	Turkey	2004	B+	8
HSBC Bank AS	Turkey	2005	BB-	9
HSBC Bank AS	Turkey	2006	N/A	N/A
HSBC Bank AS	Turkey	2007	N/A	N/A
HSBC Bank AS	Turkey	2008	N/A	N/A
HSBC Bank AS	Turkey	2009	N/A	N/A
HSBC Bank AS	Turkey	2010	N/A	N/A
HSBC Bank AS	Turkey	2011	N/A	N/A
HSBC Bank AS	Turkey	2012	N/A	N/A
ING Bank A.S.	Turkey	2000	N/A	N/A
ING Bank A.S.	Turkey	2001	B	7
ING Bank A.S.	Turkey	2002	B	7
ING Bank A.S.	Turkey	2003	B	7
ING Bank A.S.	Turkey	2004	B+	8
ING Bank A.S.	Turkey	2005	BB-	9
ING Bank A.S.	Turkey	2006	BB-	9
ING Bank A.S.	Turkey	2007	BB	10
ING Bank A.S.	Turkey	2008	N/A	N/A
ING Bank A.S.	Turkey	2009	N/A	N/A
ING Bank A.S.	Turkey	2010	N/A	N/A
ING Bank A.S.	Turkey	2011	N/A	N/A
ING Bank A.S.	Turkey	2012	BBB	13
Is Finansal Kiralama AS	Turkey	2000	N/A	N/A
Is Finansal Kiralama AS	Turkey	2001	N/A	N/A
Is Finansal Kiralama AS	Turkey	2002	N/A	N/A
Is Finansal Kiralama AS	Turkey	2003	N/A	N/A
Is Finansal Kiralama AS	Turkey	2004	N/A	N/A
Is Finansal Kiralama AS	Turkey	2005	BB-	9
Is Finansal Kiralama AS	Turkey	2006	BB	10
Is Finansal Kiralama AS	Turkey	2007	BB	10
Is Finansal Kiralama AS	Turkey	2008	BB	10
Is Finansal Kiralama AS	Turkey	2009	BBB-	12
Is Finansal Kiralama AS	Turkey	2010	BBB-	12
Is Finansal Kiralama AS	Turkey	2011	BBB-	12
Is Finansal Kiralama AS	Turkey	2012	BBB	13
Kocbank AS	Turkey	2000	N/A	N/A
Kocbank AS	Turkey	2001	B	7
Kocbank AS	Turkey	2002	B+	8
Kocbank AS	Turkey	2003	B	7
Kocbank AS	Turkey	2004	B+	8
Kocbank AS	Turkey	2005	BB-	9
Kocbank AS	Turkey	2006	N/A	N/A
Kocbank AS	Turkey	2007	N/A	N/A
Kocbank AS	Turkey	2008	N/A	N/A
Kocbank AS	Turkey	2009	N/A	N/A
Kocbank AS	Turkey	2010	N/A	N/A
Kocbank AS	Turkey	2011	N/A	N/A
Kocbank AS	Turkey	2012	N/A	N/A
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2000	N/A	N/A
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2001	N/A	N/A
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2002	N/A	N/A

Kuveyt Turk Katilim Bankasi A.S.	Turkey	2003	N/A	N/A
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2004	B+	8
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2005	BB-	9
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2006	BB	10
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2007	BB	10
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2008	BB	10
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2009	BBB-	12
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2010	BBB-	12
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2011	BBB-	12
Kuveyt Turk Katilim Bankasi A.S.	Turkey	2012	BBB	13
Sabanci Bank Limited	Turkey	2000	BBB	13
Sabanci Bank Limited	Turkey	2001	BBB	13
Sabanci Bank Limited	Turkey	2002	BBB	13
Sabanci Bank Limited	Turkey	2003	BBB	13
Sabanci Bank Limited	Turkey	2004	BBB	13
Sabanci Bank Limited	Turkey	2005	BBB	13
Sabanci Bank Limited	Turkey	2006	BBB	13
Sabanci Bank Limited	Turkey	2007	N/A	N/A
Sabanci Bank Limited	Turkey	2008	N/A	N/A
Sabanci Bank Limited	Turkey	2009	N/A	N/A
Sabanci Bank Limited	Turkey	2010	N/A	N/A
Sabanci Bank Limited	Turkey	2011	N/A	N/A
Sabanci Bank Limited	Turkey	2012	N/A	N/A
Sekerbank T.A.S.	Turkey	2000	N/A	N/A
Sekerbank T.A.S.	Turkey	2001	N/A	N/A
Sekerbank T.A.S.	Turkey	2002	N/A	N/A
Sekerbank T.A.S.	Turkey	2003	N/A	N/A
Sekerbank T.A.S.	Turkey	2004	B-	6
Sekerbank T.A.S.	Turkey	2005	B-	6
Sekerbank T.A.S.	Turkey	2006	B-	6
Sekerbank T.A.S.	Turkey	2007	B	7
Sekerbank T.A.S.	Turkey	2008	B	7
Sekerbank T.A.S.	Turkey	2009	B	7
Sekerbank T.A.S.	Turkey	2010	B+	8
Sekerbank T.A.S.	Turkey	2011	BB-	9
Sekerbank T.A.S.	Turkey	2012	BB-	9
Tekstil Bankasi A.S.	Turkey	2000	N/A	N/A
Tekstil Bankasi A.S.	Turkey	2001	N/A	N/A
Tekstil Bankasi A.S.	Turkey	2002	N/A	N/A
Tekstil Bankasi A.S.	Turkey	2003	B-	6
Tekstil Bankasi A.S.	Turkey	2004	B	7
Tekstil Bankasi A.S.	Turkey	2005	B	7
Tekstil Bankasi A.S.	Turkey	2006	B	7
Tekstil Bankasi A.S.	Turkey	2007	B	7
Tekstil Bankasi A.S.	Turkey	2008	B	7
Tekstil Bankasi A.S.	Turkey	2009	B	7
Tekstil Bankasi A.S.	Turkey	2010	B+	8
Tekstil Bankasi A.S.	Turkey	2011	B+	8
Tekstil Bankasi A.S.	Turkey	2012	B+	8
Turk Ekonomi Bankasi AS	Turkey	2000	N/A	N/A
Turk Ekonomi Bankasi AS	Turkey	2001	B	7
Turk Ekonomi Bankasi AS	Turkey	2002	B	7
Turk Ekonomi Bankasi AS	Turkey	2003	B	7
Turk Ekonomi Bankasi AS	Turkey	2004	B+	8

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Turk Ekonomi Bankasi AS	Turkey	2005	BB+	11
Turk Ekonomi Bankasi AS	Turkey	2006	BB	10
Turk Ekonomi Bankasi AS	Turkey	2007	BB	10
Turk Ekonomi Bankasi AS	Turkey	2008	BB	10
Turk Ekonomi Bankasi AS	Turkey	2009	BBB-	12
Turk Ekonomi Bankasi AS	Turkey	2010	BBB-	12
Turk Ekonomi Bankasi AS	Turkey	2011	BBB-	12
Turk Ekonomi Bankasi AS	Turkey	2012	BBB	13
Turkiye Finans Katilim Bankasi AS	Turkey	2000	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2001	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2002	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2003	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2004	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2005	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2006	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2007	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2008	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2009	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2010	N/A	N/A
Turkiye Finans Katilim Bankasi AS	Turkey	2011	BBB-	12
Turkiye Finans Katilim Bankasi AS	Turkey	2012	BBB	13
Turkiye Garanti Bankasi AS	Turkey	2000	BB-	9
Turkiye Garanti Bankasi AS	Turkey	2001	B	7
Turkiye Garanti Bankasi AS	Turkey	2002	B	7
Turkiye Garanti Bankasi AS	Turkey	2003	B	7
Turkiye Garanti Bankasi AS	Turkey	2004	B+	8
Turkiye Garanti Bankasi AS	Turkey	2005	BB-	9
Turkiye Garanti Bankasi AS	Turkey	2006	BB	10
Turkiye Garanti Bankasi AS	Turkey	2007	BB	10
Turkiye Garanti Bankasi AS	Turkey	2008	BB	10
Turkiye Garanti Bankasi AS	Turkey	2009	BBB-	12
Turkiye Garanti Bankasi AS	Turkey	2010	BBB-	12
Turkiye Garanti Bankasi AS	Turkey	2011	BBB-	12
Turkiye Garanti Bankasi AS	Turkey	2012	BBB	13
Turkiye Halk Bankasi AS	Turkey	2000	BB-	9
Turkiye Halk Bankasi AS	Turkey	2001	B	7
Turkiye Halk Bankasi AS	Turkey	2002	B	7
Turkiye Halk Bankasi AS	Turkey	2003	B	7
Turkiye Halk Bankasi AS	Turkey	2004	B+	8
Turkiye Halk Bankasi AS	Turkey	2005	BB-	9
Turkiye Halk Bankasi AS	Turkey	2006	BB-	9
Turkiye Halk Bankasi AS	Turkey	2007	BB-	9
Turkiye Halk Bankasi AS	Turkey	2008	BB-	9
Turkiye Halk Bankasi AS	Turkey	2009	BB+	11
Turkiye Halk Bankasi AS	Turkey	2010	BB+	11
Turkiye Halk Bankasi AS	Turkey	2011	BB+	11
Turkiye Halk Bankasi AS	Turkey	2012	BBB-	12
Turkiye Is Bankasi - Isbank	Turkey	2000	BB-	9
Turkiye Is Bankasi - Isbank	Turkey	2001	B	7
Turkiye Is Bankasi - Isbank	Turkey	2002	B	7
Turkiye Is Bankasi - Isbank	Turkey	2003	B	7
Turkiye Is Bankasi - Isbank	Turkey	2004	B+	8
Turkiye Is Bankasi - Isbank	Turkey	2005	BB-	9
Turkiye Is Bankasi - Isbank	Turkey	2006	BB	10

Turkiye Is Bankasi - Isbank	Turkey	2007	BB	10
Turkiye Is Bankasi - Isbank	Turkey	2008	BB	10
Turkiye Is Bankasi - Isbank	Turkey	2009	BBB-	12
Turkiye Is Bankasi - Isbank	Turkey	2010	BBB-	12
Turkiye Is Bankasi - Isbank	Turkey	2011	BBB-	12
Turkiye Is Bankasi - Isbank	Turkey	2012	BBB	13
Turkiye Kalkinma Bankasi AS	Turkey	2000	N/A	N/A
Turkiye Kalkinma Bankasi AS	Turkey	2001	B	7
Turkiye Kalkinma Bankasi AS	Turkey	2002	B	7
Turkiye Kalkinma Bankasi AS	Turkey	2003	B	7
Turkiye Kalkinma Bankasi AS	Turkey	2004	B+	8
Turkiye Kalkinma Bankasi AS	Turkey	2005	BB-	9
Turkiye Kalkinma Bankasi AS	Turkey	2006	BB-	9
Turkiye Kalkinma Bankasi AS	Turkey	2007	BB-	9
Turkiye Kalkinma Bankasi AS	Turkey	2008	BB-	9
Turkiye Kalkinma Bankasi AS	Turkey	2009	BB+	11
Turkiye Kalkinma Bankasi AS	Turkey	2010	BB+	11
Turkiye Kalkinma Bankasi AS	Turkey	2011	BB+	11
Turkiye Kalkinma Bankasi AS	Turkey	2012	BBB-	12
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2000	N/A	N/A
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2001	N/A	N/A
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2002	B	7
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2003	B	7
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2004	B+	8
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2005	BB-	9
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2006	BB-	9
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2007	BB-	9
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2008	BB	10
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2009	BB+	11
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2010	BB+	11
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2011	BB+	11
Turkiye Sinai Kalkinma Bankasi AS	Turkey	2012	BBB-	12
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2000	BB-	9
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2001	B	7
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2002	B-	6
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2003	B	7
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2004	B+	8
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2005	BB-	9
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2006	BB-	9
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2007	BB-	9
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2008	BB-	9
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2009	BB+	11
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2010	BB+	11
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2011	BB+	11
Turkiye Vakiflar Bankasi T.A.O.	Turkey	2012	BBB-	12
Turkland Bank	Turkey	2000	N/A	N/A
Turkland Bank	Turkey	2001	N/A	N/A
Turkland Bank	Turkey	2002	N/A	N/A
Turkland Bank	Turkey	2003	B-	6
Turkland Bank	Turkey	2004	B-	6
Turkland Bank	Turkey	2005	B-	6
Turkland Bank	Turkey	2006	B-	6
Turkland Bank	Turkey	2007	BB	10
Turkland Bank	Turkey	2008	BB	10

Turkland Bank	Turkey	2009	BBB-	12
Turkland Bank	Turkey	2010	BBB-	12
Turkland Bank	Turkey	2011	BBB-	12
Turkland Bank	Turkey	2012	BBB-	12
Yapi ve Kredi Bankasi AS	Turkey	2000	BB-	9
Yapi ve Kredi Bankasi AS	Turkey	2001	B	7
Yapi ve Kredi Bankasi AS	Turkey	2002	B-	6
Yapi ve Kredi Bankasi AS	Turkey	2003	B	7
Yapi ve Kredi Bankasi AS	Turkey	2004	B+	8
Yapi ve Kredi Bankasi AS	Turkey	2005	BB-	9
Yapi ve Kredi Bankasi AS	Turkey	2006	BB	10
Yapi ve Kredi Bankasi AS	Turkey	2007	BB	10
Yapi ve Kredi Bankasi AS	Turkey	2008	BB	10
Yapi ve Kredi Bankasi AS	Turkey	2009	BBB-	12
Yapi ve Kredi Bankasi AS	Turkey	2010	BBB-	12
Yapi ve Kredi Bankasi AS	Turkey	2011	BBB-	12
Yapi ve Kredi Bankasi AS	Turkey	2012	BBB	13
Ziraat Bankasi A.S.	Turkey	2000	BB-	9
Ziraat Bankasi A.S.	Turkey	2001	B	7
Ziraat Bankasi A.S.	Turkey	2002	B	7
Ziraat Bankasi A.S.	Turkey	2003	B	7
Ziraat Bankasi A.S.	Turkey	2004	B+	8
Ziraat Bankasi A.S.	Turkey	2005	BB-	9
Ziraat Bankasi A.S.	Turkey	2006	BB-	9
Ziraat Bankasi A.S.	Turkey	2007	BB-	9
Ziraat Bankasi A.S.	Turkey	2008	BB-	9
Ziraat Bankasi A.S.	Turkey	2009	BB+	11
Ziraat Bankasi A.S.	Turkey	2010	BB+	11
Ziraat Bankasi A.S.	Turkey	2011	BB+	11
Ziraat Bankasi A.S.	Turkey	2012	BBB-	12
Abu Dhabi Commercial Bank	UAE	2000	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2001	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2002	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2003	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2004	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2005	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2006	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2007	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2008	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2009	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2010	N/A	N/A
Abu Dhabi Commercial Bank	UAE	2011	A+	17
Abu Dhabi Commercial Bank	UAE	2012	A+	17
Abu Dhabi Islamic Bank	UAE	2000	N/A	N/A
Abu Dhabi Islamic Bank	UAE	2001	A-	15
Abu Dhabi Islamic Bank	UAE	2002	A-	15
Abu Dhabi Islamic Bank	UAE	2003	A-	15
Abu Dhabi Islamic Bank	UAE	2004	A-	15
Abu Dhabi Islamic Bank	UAE	2005	A-	15
Abu Dhabi Islamic Bank	UAE	2006	A	16
Abu Dhabi Islamic Bank	UAE	2007	A+	17
Abu Dhabi Islamic Bank	UAE	2008	A+	17
Abu Dhabi Islamic Bank	UAE	2009	A+	17
Abu Dhabi Islamic Bank	UAE	2010	A+	17

Abu Dhabi Islamic Bank	UAE	2011	A+	17
Abu Dhabi Islamic Bank	UAE	2012	A+	17
Bank of Sharjah	UAE	2000	N/A	N/A
Bank of Sharjah	UAE	2001	BBB+	14
Bank of Sharjah	UAE	2002	BBB+	14
Bank of Sharjah	UAE	2003	BBB+	14
Bank of Sharjah	UAE	2004	BBB+	14
Bank of Sharjah	UAE	2005	BBB+	14
Bank of Sharjah	UAE	2006	A-	15
Bank of Sharjah	UAE	2007	A-	15
Bank of Sharjah	UAE	2008	A-	15
Bank of Sharjah	UAE	2009	BBB+	14
Bank of Sharjah	UAE	2010	BBB+	14
Bank of Sharjah	UAE	2011	BBB+	14
Bank of Sharjah	UAE	2012	BBB+	14
Commercial Bank of Dubai	UAE	2000	A	16
Commercial Bank of Dubai	UAE	2001	A-	15
Commercial Bank of Dubai	UAE	2002	A-	15
Commercial Bank of Dubai	UAE	2003	A-	15
Commercial Bank of Dubai	UAE	2004	A-	15
Commercial Bank of Dubai	UAE	2005	A-	15
Commercial Bank of Dubai	UAE	2006	A	16
Commercial Bank of Dubai	UAE	2007	A	16
Commercial Bank of Dubai	UAE	2008	A	16
Commercial Bank of Dubai	UAE	2009	A-	15
Commercial Bank of Dubai	UAE	2010	A-	15
Commercial Bank of Dubai	UAE	2011	A-	15
Commercial Bank of Dubai	UAE	2012	A-	15
Dubai Bank (PJSC)	UAE	2000	N/A	N/A
Dubai Bank (PJSC)	UAE	2001	N/A	N/A
Dubai Bank (PJSC)	UAE	2002	N/A	N/A
Dubai Bank (PJSC)	UAE	2003	N/A	N/A
Dubai Bank (PJSC)	UAE	2004	N/A	N/A
Dubai Bank (PJSC)	UAE	2005	N/A	N/A
Dubai Bank (PJSC)	UAE	2006	N/A	N/A
Dubai Bank (PJSC)	UAE	2007	A	16
Dubai Bank (PJSC)	UAE	2008	A-	15
Dubai Bank (PJSC)	UAE	2009	BBB-	12
Dubai Bank (PJSC)	UAE	2010	BBB-	12
Dubai Bank (PJSC)	UAE	2011	BBB-	12
Dubai Bank (PJSC)	UAE	2012	BBB	13
Dubai Islamic Bank	UAE	2000	N/A	N/A
Dubai Islamic Bank	UAE	2001	N/A	N/A
Dubai Islamic Bank	UAE	2002	N/A	N/A
Dubai Islamic Bank	UAE	2003	N/A	N/A
Dubai Islamic Bank	UAE	2004	N/A	N/A
Dubai Islamic Bank	UAE	2005	N/A	N/A
Dubai Islamic Bank	UAE	2006	N/A	N/A
Dubai Islamic Bank	UAE	2007	N/A	N/A
Dubai Islamic Bank	UAE	2008	N/A	N/A
Dubai Islamic Bank	UAE	2009	N/A	N/A
Dubai Islamic Bank	UAE	2010	N/A	N/A
Dubai Islamic Bank	UAE	2011	A	16
Dubai Islamic Bank	UAE	2012	A	16

Emirates Bank International PJSC	UAE	2000	N/A	N/A
Emirates Bank International PJSC	UAE	2001	A	16
Emirates Bank International PJSC	UAE	2002	A	16
Emirates Bank International PJSC	UAE	2003	A	16
Emirates Bank International PJSC	UAE	2004	A	16
Emirates Bank International PJSC	UAE	2005	A	16
Emirates Bank International PJSC	UAE	2006	A+	17
Emirates Bank International PJSC	UAE	2007	AA-	18
Emirates Bank International PJSC	UAE	2008	AA-	18
Emirates Bank International PJSC	UAE	2009	N/A	N/A
Emirates Bank International PJSC	UAE	2010	N/A	N/A
Emirates Bank International PJSC	UAE	2011	N/A	N/A
Emirates Bank International PJSC	UAE	2012	N/A	N/A
Emirates NBD (PJSC)	UAE	2000	N/A	N/A
Emirates NBD (PJSC)	UAE	2001	N/A	N/A
Emirates NBD (PJSC)	UAE	2002	N/A	N/A
Emirates NBD (PJSC)	UAE	2003	N/A	N/A
Emirates NBD (PJSC)	UAE	2004	N/A	N/A
Emirates NBD (PJSC)	UAE	2005	N/A	N/A
Emirates NBD (PJSC)	UAE	2006	N/A	N/A
Emirates NBD (PJSC)	UAE	2007	N/A	N/A
Emirates NBD (PJSC)	UAE	2008	N/A	N/A
Emirates NBD (PJSC)	UAE	2009	A+	17
Emirates NBD (PJSC)	UAE	2010	A+	17
Emirates NBD (PJSC)	UAE	2011	A+	17
Emirates NBD (PJSC)	UAE	2012	A+	17
First Gulf Bank	UAE	2000	N/A	N/A
First Gulf Bank	UAE	2001	N/A	N/A
First Gulf Bank	UAE	2002	N/A	N/A
First Gulf Bank	UAE	2003	N/A	N/A
First Gulf Bank	UAE	2004	N/A	N/A
First Gulf Bank	UAE	2005	BBB+	14
First Gulf Bank	UAE	2006	A	16
First Gulf Bank	UAE	2007	A+	17
First Gulf Bank	UAE	2008	A+	17
First Gulf Bank	UAE	2009	A+	17
First Gulf Bank	UAE	2010	A+	17
First Gulf Bank	UAE	2011	A+	17
First Gulf Bank	UAE	2012	A+	17
MashreqBank PSC	UAE	2000	N/A	N/A
MashreqBank PSC	UAE	2001	A-	15
MashreqBank PSC	UAE	2002	A-	15
MashreqBank PSC	UAE	2003	A-	15
MashreqBank PSC	UAE	2004	A-	15
MashreqBank PSC	UAE	2005	A-	15
MashreqBank PSC	UAE	2006	A	16
MashreqBank PSC	UAE	2007	A+	17
MashreqBank PSC	UAE	2008	A+	17
MashreqBank PSC	UAE	2009	A	16
MashreqBank PSC	UAE	2010	A	16
MashreqBank PSC	UAE	2011	A	16
MashreqBank PSC	UAE	2012	A	16
National Bank of Abu Dhabi	UAE	2000	N/A	N/A
National Bank of Abu Dhabi	UAE	2001	A	16

National Bank of Abu Dhabi	UAE	2002	A	16
National Bank of Abu Dhabi	UAE	2003	A	16
National Bank of Abu Dhabi	UAE	2004	A	16
National Bank of Abu Dhabi	UAE	2005	A	16
National Bank of Abu Dhabi	UAE	2006	A+	17
National Bank of Abu Dhabi	UAE	2007	AA-	18
National Bank of Abu Dhabi	UAE	2008	AA-	18
National Bank of Abu Dhabi	UAE	2009	AA-	18
National Bank of Abu Dhabi	UAE	2010	AA-	18
National Bank of Abu Dhabi	UAE	2011	AA-	18
National Bank of Abu Dhabi	UAE	2012	AA-	18
National Bank of Ras Al-Khaimah PSC	UAE	2000	N/A	N/A
National Bank of Ras Al-Khaimah PSC	UAE	2001	N/A	N/A
National Bank of Ras Al-Khaimah PSC	UAE	2002	N/A	N/A
National Bank of Ras Al-Khaimah PSC	UAE	2003	N/A	N/A
National Bank of Ras Al-Khaimah PSC	UAE	2004	N/A	N/A
National Bank of Ras Al-Khaimah PSC	UAE	2005	BBB+	14
National Bank of Ras Al-Khaimah PSC	UAE	2006	A-	15
National Bank of Ras Al-Khaimah PSC	UAE	2007	A-	15
National Bank of Ras Al-Khaimah PSC	UAE	2008	A-	15
National Bank of Ras Al-Khaimah PSC	UAE	2009	BBB+	14
National Bank of Ras Al-Khaimah PSC	UAE	2010	BBB+	14
National Bank of Ras Al-Khaimah PSC	UAE	2011	BBB+	14
National Bank of Ras Al-Khaimah PSC	UAE	2012	BBB+	14
National Bank of Umm Al-Qaiwain PSC	UAE	2000	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2001	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2002	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2003	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2004	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2005	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2006	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2007	N/A	N/A
National Bank of Umm Al-Qaiwain PSC	UAE	2008	BBB+	14
National Bank of Umm Al-Qaiwain PSC	UAE	2009	BBB+	14
National Bank of Umm Al-Qaiwain PSC	UAE	2010	BBB+	14
National Bank of Umm Al-Qaiwain PSC	UAE	2011	BBB+	14
National Bank of Umm Al-Qaiwain PSC	UAE	2012	N/A	N/A
Sharjah Islamic Bank	UAE	2000	N/A	N/A
Sharjah Islamic Bank	UAE	2001	N/A	N/A
Sharjah Islamic Bank	UAE	2002	N/A	N/A
Sharjah Islamic Bank	UAE	2003	N/A	N/A
Sharjah Islamic Bank	UAE	2004	N/A	N/A
Sharjah Islamic Bank	UAE	2005	N/A	N/A
Sharjah Islamic Bank	UAE	2006	N/A	N/A
Sharjah Islamic Bank	UAE	2007	N/A	N/A
Sharjah Islamic Bank	UAE	2008	N/A	N/A
Sharjah Islamic Bank	UAE	2009	N/A	N/A
Sharjah Islamic Bank	UAE	2010	N/A	N/A
Sharjah Islamic Bank	UAE	2011	BBB+	14
Sharjah Islamic Bank	UAE	2012	BBB+	14
Union National Bank (PJSC)	UAE	2000	A	16
Union National Bank (PJSC)	UAE	2001	A-	15
Union National Bank (PJSC)	UAE	2002	A-	15
Union National Bank (PJSC)	UAE	2003	A-	15

Union National Bank (PJSC)	UAE	2004	A-	15
Union National Bank (PJSC)	UAE	2005	A-	15
Union National Bank (PJSC)	UAE	2006	A	16
Union National Bank (PJSC)	UAE	2007	A+	17
Union National Bank (PJSC)	UAE	2008	A+	17
Union National Bank (PJSC)	UAE	2009	A+	17
Union National Bank (PJSC)	UAE	2010	A+	17
Union National Bank (PJSC)	UAE	2011	A+	17
Union National Bank (PJSC)	UAE	2012	A+	17

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