Effects of Corporate Governance Mechanisms on Financial Flexibility, Risk-taking Behaviour and Risk Management Effectiveness: A Comparison Study between Conventional and Islamic Banking Systems

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Abstract

This thesis focuses on four major topics in banking: corporate governance mechanisms, financial flexibility, risk-taking and risk management effectiveness of banks. It enhances understanding of how differences in corporate governance structures between Islamic and Conventional banks might affect their decision-making process regarding their corporate financial and risk management policies. Employing a sample of 28 Islamic banks and 37 conventional banks operated in the Middle East and North Africa (MENA) region over the period 2009–2015, the thesis comprises three main objectives. Firstly, a comparison study between Islamic (IBs) and Conventional banks (CBs) is conducted to investigate the impacts of the board of directors structure, the existence of dedicated risk committee, and the Shari'ah supervisory board (SSB) on banks financial flexibility. The results indicate a positive relationship between board size and financial flexibility for Conventional banks. Intriguingly, this relationship turns to be negative for Islamic banks. Furthermore, it also shows that the existence of a dedicated risk committee enhances the financial flexibility of both CBs and IBs in general. In the context of Islamic bank per se, the evidence is obtained such that SSBs size and percentage of members who have multi-membership have a positive association with the IBs financial flexibility. The second objective of this thesis is to investigate the effects of the new risk governance framework (i.e. a dedicated risk committee (RC) and a Chief Risk Officer (CRO)) on the bank risk-taking behaviour for both conventional and Islamic banking systems. In extending the literature (which is quite scarce) concerning the relationship between risk governance and risk-taking, this study investigates five main risk aspects: market, credit, operational, liquidity, and insolvency risks. Furthermore, this study is the first to be conducted in Islamic Banks. The findings indicate a negative association between risk governance index and risk perspectives across both CBs and IBs— except as regards credit risk since that is only applicable to CBs. Last but not least, the third objective of this thesis is to investigate how risk governance influences the effectiveness of banks in managing their risks. The study finds that CBs performance is more positively associated with risk-taking for banks with stronger risk governance. In other words, these risk governance mechanisms significantly improve the effectiveness of risk management within CBs but do not influence the risk management effectiveness of IBs.

Thesis Outcomes

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Dedication

I dedicate this thesis to my parents, Abdulrahman and Latefa, who have been praying and waiting patiently for this moment. I also dedicate it to my wife (Hana) and my children (Dania, Deem and Abdulrahman), for there constant support and encouragement.

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I am extremely thankful to the Almighty Allah for his blessings and for honouring me with his guidance in order to complete this thesis successfully.

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Furthermore, I must express my gratitude to my beloved wife (Hana) and my children (Dania, Deem and Abdulrahman). Without there constant support, love and encouragement I would not have been able to progress through the difficult periods I experienced. I would like also to take this opportunity to thank my parents, brothers and sisters for their continuous prayers, encouragement and motivation. Last but not least, my appreciation is extended to my friends and colleagues at Newcastle University Business School who were always there to offer help and share the moments of stress during this journey.

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List of Abbreviations

AAOIFIs	Accounting and Auditing Organization for Islamic Financial Institutions
AC	Audit Committee
AR(1)	First-order serial correlation
AR(2)	Second-order correlation
BCBS	Basel Committee on Banking Supervision
BODs	Board of Directors
CBs	Conventional Banks
CG	Corporate Governance
CRO	Chief Risk Officer
DIB	Dubai Islamic Bank
ERM	Enterprise risk management
FF	Financial Flexibility
FFI	Financial flexibility Index
FSA	Financial Services Authority
GCC	Gulf Cooperation Council
GMM	Generalized Methods of Moments
IAHs	Investors Account Holders
IBs	Islamic Banks
ICG	Islamic Corporate Governance
IDB	Islamic Development Bank
IFI	Islamic Financial Institution
IFSB	Islamic Financial Services Board
IIRA	Islamic International Rating Agency
IRGC	International Risk Governance Council
MENA	Middle East and North Africa
OIC	Organization of Islamic Countries
OLS	Ordinary Least Squares
PLSIAs	Profit-Losses sharing investment accounts
RC	Risk committee
RG	Risk Governance
RGI	Risk Governance Index
SSB	Shari’ah Supervisory Board
VIFs	Variance inflation factors

Chapter 1. Introduction

1.1 Introduction

Corporate governance plays an important role in ensuring that the frameworks of corporations are held in place, and hence that they survive and succeed. Particularly in the 1990s, following a number of firm failures in developed countries such as America and Britain, the prominence of corporate governance issues increased significantly, drawing greater attention from academics and regulators (Daily and Dalton, 1994; Dalton et al., 1998). As a result, corporate governance topics have been investigated in many different fields such as accounting, finance, management and law (Denis, 2001; Solomon, 2010). Despite such extensive research on the topic, corporate governance still revealed that it had many weaknesses in the financial crisis of 2007. Academic research places the blame on these weaknesses for the crisis. Specifically, previous studies (e.g. Kirkpatrick, 2009; Pathan, 2009; Minton et al., 2014) argued that the failure of the internal corporate governance system to manage risk-taking may be the key reason for the financial crisis.

Among many different aspects of corporate governance, academics and practitioners put major blame on the weaknesses of boards of directors, the body responsible for all of a firm's strategic decisions, in performing their responsibilities (Andres and Vallelado, 2008; Erkens et al., 2012). Erkens et al. (2012) mentioned that the board of directors is the ultimate body responsible for failing to protect the shareholders' interests and for not concentrating on the long-term objectives of firms. As a result, most of the countries around the world acknowledge the importance of improving corporate governance codes, specifically regarding the board of directors' role in managing risks and ensuring financial soundness and stability. Additionally, countries in the Middle East and North Africa (MENA) have also recognised the importance of enhancing their corporate governance codes. Thus, regulatory bodies and policy makers in the MENA region have begun to improve and develop their corporate governance guidelines (Shehata, 2015).

In addition to the board of directors, its sub-committees started attracting the attention of academics and practitioners regarding their risk management roles. The regulatory pressure motivates financial firms to adopt more advanced enterprise risk management systems. That is to enhance risk management-related to corporate governance mechanisms (risk governance), specifically, forming a dedicated risk committee and assigning a chief risk officer (CRO) (Lundqvist, 2015). Previously, audit committees were responsible for overseeing firms' risks.

Nevertheless, corporate governance codes around the world started to emphasise the importance of having a dedicated board level committee (i.e. the Risk Committee) that is responsible for the comprehensive risk of the firm. This is because the audit committee might not able to meet their responsibilities due to the complexity of the risks faced by financial firms and other obligations that the audit committee might have (e.g. processing financial reporting).

The investigation in this thesis is conducted in the banking context specifically. There is a paucity of studies in this sector, despite its importance in financial systems. Furthermore, financial institutions have different characteristics to non-financial firms. For example, financial institutions are highly leveraged and highly regulated. Furthermore, within this industry, another type of banking system, which had previously been relatively ignored, started coming to the fore as a surprisingly resilient system during the financial crisis – the Islamic banking system. Islamic banks (IBs) have recently become a phenomenon of interest to researchers given their unique characteristics compared to conventional banks (CBs). In general, IBs have to comply with Shari'ah principles, which assure the satisfaction of the banks' clients.[1] Moreover, IBs have a different internal corporate governance mechanism, which is called multi-layer governance (Mollah and Zaman, 2015). Therefore, it is also expected that corporate governance mechanisms will have a different effect on IBs' corporate outcomes compared to those of CBs.

Given the important exposure of these corporate governance mechanisms in today's market, the main theme of this thesis is about corporate governance mechanisms, focusing on the board of directors and risk governance in both conventional and Islamic banking systems, and the Shari'ah supervisory board (SSB), which is the additional layer unique to IBs. The next section will introduce in more detail the motivations, objectives and contributions of this thesis.

1.2 Objectives of the study

The main aim of the thesis is to investigate how corporate governance mechanisms influence banks' financial flexibility, risk-taking behaviour, and risk management effectiveness in MENA region. In addition, the thesis aims to investigate how these influences are different between Islamic and Conventional banks. The study's general motivations are summarised in

[1] See section 2.3 in Chapter 2 for more explanations about Shari'ah principles and IBs' characteristics.

Figure 1.1, which contains three main objectives of this thesis. Therefore, the next section will provide detailed information about these aims and objectives.

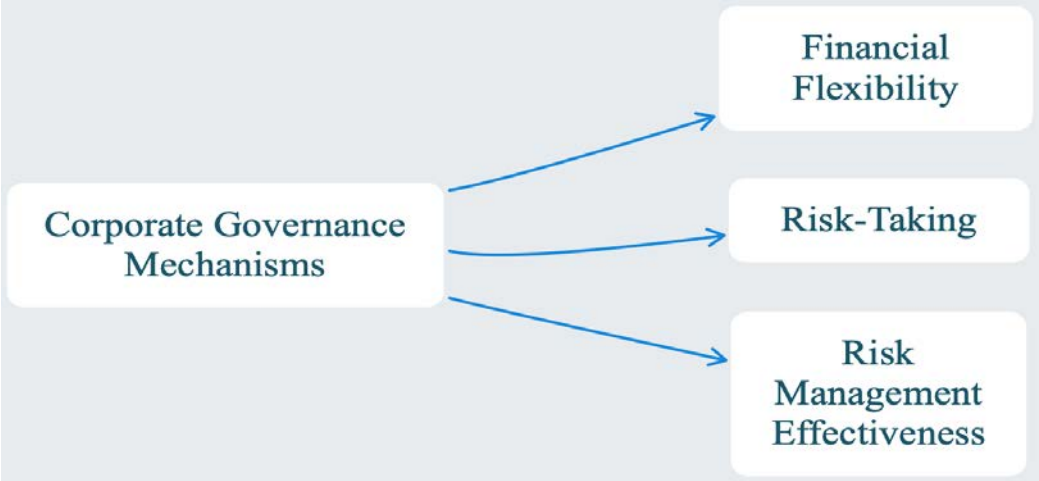

Figure 1.1. General objectives of the thesis

1.2.1 Objective 1

As depicted in Figure 1.2, the first objective of this thesis is to investigate the effects of board of directors' structures and its sub-committee (specifically the risk committee) on the financial flexibility of conventional and Islamic banks. Furthermore, as IBs are a main subject of the study, their additional governance layer, the SSB, is also studied.

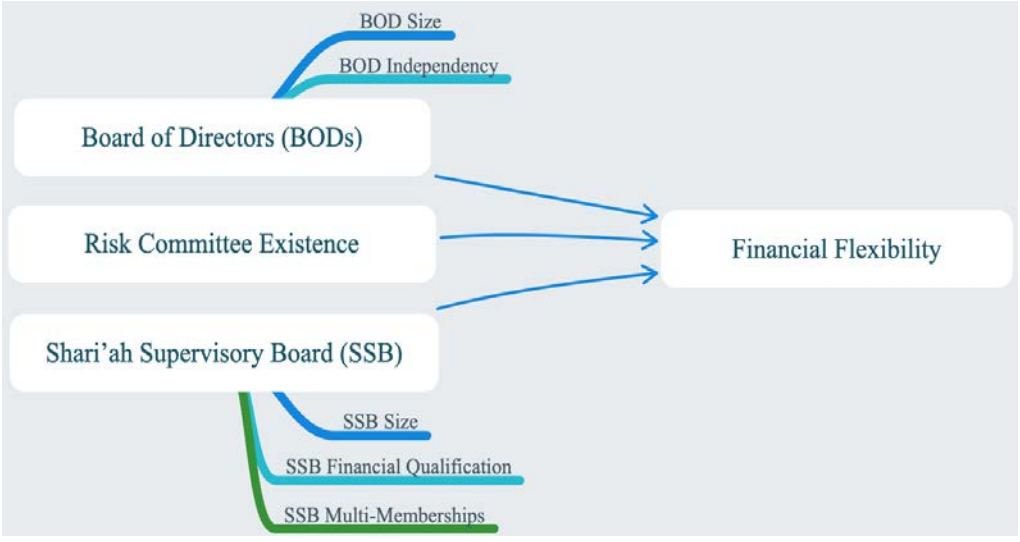

Figure 1.2 Objective 1 – Effects of Board of Directors (BOD), Risk Committee and Shari'ah Supervisory Board (SSB) on Financial Flexibility

The significance of investigating the board of directors' structure is derived from its critical monitoring and advisory roles within banks (Adams and Ferreira, 2007; Boone et al., 2007;

Coles et al., 2008; Adams and Mehran, 2012). Thus, the board's effectiveness can be derived from the structure of the board. This thesis focuses on two components of the board structure: board size and independence. The majority of previous literature (e.g. Adams and Ferreira, 2007; Coles et al., 2008; Adams et al., 2010; Wintoki et al., 2012) investigates these two components, which show how important it is to consider their effectiveness on the firm's decision-making process. However, Cheng (2008) and Nakano and Nguyen (2012) argue that previous literature has obtained mixed findings about the relationship between board structures (size and independence) and corporate outcomes (e.g. financial performances and firm value)[2]. This inconclusive conclusion motivates this study to investigate their influences on banks' financial flexibility.

In the comparison study between IBs and CBs, differences in their governance structures are taken into account. Specifically, IBs have an additional governance layer (SSB) that monitors the management's and board's activities. It plays an important role in earning the IB's clients' trust in the bank's compliance with Shari'ah Law. Therefore, this thesis also investigates the influence of three important characteristics of SSBs (SSB size, member qualifications, and member multi-membership) on IBs' financial flexibility.

Recently, the regulators and agency authorities have urged the establishment of a dedicated committee that is explicitly responsible for overseeing and monitoring the risk of banks. This responsible body is the risk committee. Klein (2002) argues that as board committees have independent and more frequent meetings than the full board, they are more effective in achieving their goals. Applying this view, it is expected that risk committees could play an effective role in the decision-making process, which in turn affects financial flexibility.

1.2.2 Objective 2

As depicted in Figure 1.3, the second objective of this thesis is to investigate the effects of risk governance on the risk-taking behaviour of conventional and Islamic banks. The risk governance covered in this study comprises the characteristics of the risk committee and CRO.

[2] For example, while several studies (i.e. Yermack, 1996; Eisenberg et al., 1998) show that smaller board is more effective in increasing the firm value, others (i.e. Coles et al., 2008; linck et al., 2008) reveal that a larger board size is more effective in enhancing the firm value for large and complex firms. The non-executive director (independent member) has to be independent from the firm management (Hart, 1995), and provide strong monitoring of the management's actions to protect the shareholders' interests (Lim et al., 2007). Nevertheless, it is hard to observe whether this type of member is really independent form the management or not. Thus, Hermalin and Weisbach, (2003) discuss how the unclear relationship between independent director and the management might lead to mixed results in their relationship with corporate outcomes.

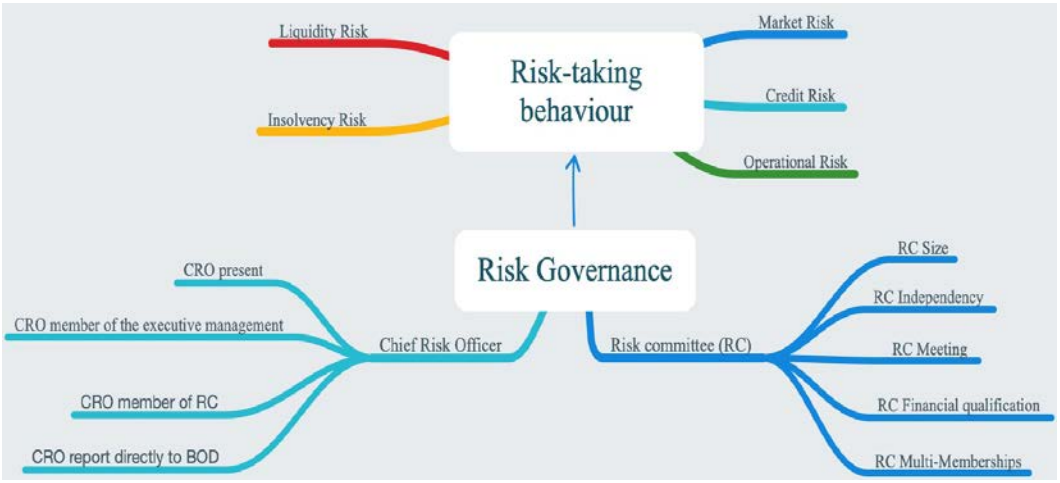

Figure 1.3 Objective 2 – Effects of Risk Governance on Risk-taking Behaviour

More than just the existence of a risk committee within a board, but also its characteristics (i.e. size, independence, number of meetings, multi-membership, and financial qualifications) should be investigated. These characteristics of risk committees might determine how the risk committee effectively manage corporate risk-taking behaviour. Recently, firms have started to assign full responsibility for a firm's comprehensive risk management to one individual – the leader of the independent risk management department, the CRO. As the CRO evidently holds critical roles related to firms' risk management, firms' risk-taking behaviour is likely to be affected by the CRO. This study measures the importance of the CRO's role by considering the following aspects: the presence of a CRO, CROs in executive management, CRO as a member of risk committees, and the CRO's direct report to the board of directors. These nine investigated characteristics of risk committees and CROs are conceptualised into one risk governance index.

Regarding the risk-taking behaviour of banks, regulators recommend that banks improve their corporate governance mechanisms, not to manage any particular type of risk, but to place more emphasis on all risk aspects of banks. In other words, they are concerned about the comprehensive risk level of banks. Therefore, this study examines the five most common risk aspects that banks are exposed to: market risk, credit risk, operational risk, liquidity risk and insolvency risk.[3]

[3] Previous banking literature, The Islamic Financial Services Board (IFSB), and the Basel Committee on Banking Supervision classify these types of risks as the major risk that banks need to face and manage effectively (BCBS, 2001; IFSB, 2005; BCBS, 2008; Sun and Chang, 2011; Acharya and Mora, 2015).

1.2.3 Objective 3

As depicted in Figure 1.4, the third objective of this thesis is to investigate the effects of risk governance on the effectiveness of risk management in conventional and Islamic banks.

Figure 1.4 Objective 3 – Effects of Risk Governance on Risk Management Effectiveness

According to the risk-return trade-off principle, if higher risk-taking can lead to a potentially higher return, then the risk-taking decision can be deemed to be appropriate as long as it matches the risk attitudes of the decision makers or stakeholders. However, it is sensible to say in general that regulators encourage the improvement of risk governance mechanisms to help the risk management process to be more effective. In other words, improving banks' risk management effectiveness is the key goal of any amendment in risk governance.

To meet these objectives, this thesis will try to answer the following research questions:

1) Are there associations between board structure and financial flexibility across conventional and Islamic banks in the MENA region? If there are, do these associations differ between the two bank systems?

2) Are there associations between the existence of a dedicated risk committee and financial flexibility across conventional and Islamic banks in the MENA region? If there are, do these associations differ between the two bank systems?

3) Are there associations between Shari'ah supervisory board effectiveness and the financial flexibility of Islamic banks in the MENA region?

4) Are there associations between the risk governance mechanisms and bank risk-taking behaviours across conventional and Islamic banks in the MENA region? If there are, do these associations differ between the two bank systems?

5) Do risk governance mechanisms influence the risk management effectiveness (the positive association between banks' risk-taking and performance) of conventional and Islamic banks in the MENA region? If they do, does this influence differ between the two bank systems? Chapter 3 addresses the first three research questions 1-3, following by Chapter 4 which addresses the other two questions 4-5.

1.3 Motivation and rational of the study

It is noticeable that academic researchers and practitioners tend to focus extensively on the financial performances of firms as this is of the utmost interest and concern to investors/shareholders. However, the on-going underlying processes, which make a significant contribution to that ultimate financial outcome of firms, as well as to their survivability, are relatively understudied. These include firms' financial flexibility, risk-taking behaviour, and risk management effectiveness. In corporate governance literature, this discrepancy in academic focus is more evident. In fact, in the banking context, it is crucial to achieve a sustainable and healthy development, rather than short-term success. The reason for this is that banks are the key financial institutions that safeguard the whole financial and economic system of a country. To achieve sustainability and healthy finance, banks should be financially flexible and possess an effective risk management policy.

Indeed, academic and market participants have started paying more attention to the concept of financial flexibility. This important financial notion has been acknowledged and discussed previously; however, there is a lack of sufficient empirical investigations on the topic in banking. Basically, financial flexibility is defined as the firm's ability to access funds to finance positive net present value projects and to withstand financial risk (Bonaimé et al., 2013; Ferrando et al., 2017). The International Risk Governance Council (IRGC, 2005) suggests a governance framework that defines the financial resilience/flexibility as a goal that need to be achieved by the risk management system. This goal helps to react and respond to a surprised events. On other word, the financial resilience goal is seen as a risk-absorbing system to withstand stress and respond to a crisis situation. There is evidence that financially flexible firms are more likely to survive in periods of economic stress (DeAngelo and DeAngelo, 2007; Gamba and Triantis, 2008; Mittoo et al., 2011; Meier et al., 2013). Financial flexibility plays a crucial role in firms' financial policy decisions. For instance, Graham and Harvey (2001) argue that financial flexibility is the most important component of a firm's capital structure. An additional interest in this context is risk-taking strategies, which influence the decision-making process in banks. Kim and Buchanan (2008) state that risk-taking is an important factor that affects the managerial decision-making process.

Consequently, both financial flexibility and risk-taking could be considered significant tools that affect the success of a firm.

After reviewing the literature of corporate governance in general, and for conventional and Islamic banks in particular, it can be seen that most of the literature investigates the relationship between corporate governance issues and firm performance (see for example, (Yermack, 1996; Coles et al., 2008; Aebi et al., 2012; Mollah and Zaman, 2015). Despite the importance of financial flexibility and risk-taking, both concepts have tended to be ignored.

Even though a few studies consider the risk-taking aspects when examining corporate governance issues, most of them have conducted their studies on non-financial firms (e.g. Adams et al., 2005; Nakano and Nguyen, 2012). Most of the corporate governance literature has excluded financial firms from their samples (Erkens et al., 2012). However, it is more important to investigate corporate governance issues in financial institutions as the latter provide access to the funding system, play an important role in economic financial stability, and generate liquidity (Arun and Turner, 2004; Levine, 2004; Staikouras et al., 2007; Andres and Vallelado, 2008). The financial sector is exposed to the "cascading effect" concept, which is that financial institutions can fail because of the failure of another financial institution in the sector (Gordon and Muller, 2011). Adams and Mehran (2003) argue that corporate governance studies should consider the special characteristics of financial institutions. Andres and Vallelado (2008) state that corporate governance mechanisms might operate in different ways because of the special characteristics of the financial sector. Those characteristics include heavy regulations (Levine, 2004), having greater information asymmetry (Adams and Mehran, 2003), having more agency problem issues (Andres and Vallelado, 2008), and working in a risky environment.

Moreover, most previous empirical studies have taken place in developed countries such as the USA and the UK. Nevertheless, it is hard to generalise these studies' findings to developing countries such as countries in the Middle East and North Africa (MENA) region. Countries in the MENA region have special contextual characteristics that might raise some concerns about whether the effective corporate governance mechanisms of developed countries would be effective in these developing countries. The MENA countries are characterised by having a strong social structure, strong individual relationships, concentrated ownership, and following the Shari'ah Law legal system (Organisation for Economic Co-operation and Development (OECD), 2005; Tricker, 2009; Shehata, 2015). Thus, differences in the regulations, disclosure and financial reporting requirements, and governance codes are

expected to exist. Also, most of the MENA countries do not have strict corporate governance codes but have voluntary corporate governance codes (e.g. Omani CG code 2002, Egyptian CG code 2005, Saudi CG code 2006 and Jordanian CG code 2007). As a result, there are expected to be differences in the corporate outcomes of firms complying with corporate governance codes in developing countries and firms complying with corporate governance codes in developed countries. Most of the banking sector in MENA countries is characterised by a dual banking system (Islamic and conventional), which helps the comparison study of this thesis in terms of the sample distribution of the two bank types.

As aforementioned, the thesis centres around the corporate governance theme. One of the most important internal corporate governance mechanisms is the board of directors. Even though the MENA countries' corporate governance codes and recommendations regarding the board of directors' effectiveness are derived from developed countries' corporate governance codes (i.e. 1992 UK Cadbury and Anglo-American models) (Hussain and Mallin, 2002; Aguilera and Cuervo-Cazurra, 2009; Piesse et al., 2012), there are several differences worth mentioning. For example, in the MENA region, the boards of directors are dominated by controlling shareholders, friends, and relatives. Furthermore, there is a lack of independent members on the board, and most firms have one person as both CEO and board chairman (Saïdi, 2004).

Taken together, it is noticeable that there are a number of differences existing between 1) non-financial and financial firms; 2) developed and developing countries; and 3) Islamic and conventional banks. Thus, it is important to examine the board of directors' structure of both Islamic and conventional banks in terms of financial flexibility and corporate risk-taking in the context of the developing dual banking system of the MENA region.

As the board of directors manages the firm's risk through their sub-committees, the thesis is motivated to cover the sub-committee that is explicitly responsible for monitoring and managing risk – that is, the risk committee. Specialist sub-committees for managing risks received more attention after the recent financial crisis. More interestingly, researchers argue that audit committees might not be effective in managing firm risks, especially for financial firms, since the financial sector is exposed to many complicated risks that need specialist members in risk management. Therefore, the study is motivated to conduct a thorough investigation into the relationship between the existence of a risk committee and a bank's financial flexibility, and how that impact is different between Islamic and conventional banks.

Furthermore, another special corporate governance mechanism, i.e. SSBs, needs to be investigated in IBs. IBs have to follow Shari'ah principles in order to earn their clients' trust, and one way to assure the latter is through having an effective SSB, which monitors the banks' transactions and financial instruments. Thus, this study also examines the relationship between SSBs and IBs' financial flexibility. To the best of my knowledge, no existing studies have investigated this relationship in IBs.

As mentioned, the thesis also studies banks' risk-taking behaviour in addition to their financial flexibility. In this regard, the study evaluates the risk governance of banks, which includes characteristics of both the risk committee and the CRO. Recent regulators bodies in the MENA countries (e.g. The Saudi Arabian Monetary Agency (2014, Principle 4, Article 78), Kuwait Capital Market Authority (2013, Principle 5.1), The Qatar Central Bank (2015, Principle 4), The Central Bank of Jordan (2016, Article 10), and The Central Bank of Egypt (2016, Principle 5, article 5.2.30), (BSBC)) emphasise the important roles of the risk committee and CRO in managing and monitoring comprehensive firm risk. Lastly, the thesis attempts to study the risk management effectiveness of banks. In practice, the main purposes of improving risk governance, either by creating a specialist risk committee or assigning a CRO, are to enhance the effectiveness of risk management, not to reduce/increase risk-taking. The reason for this is that a reduction/increase in risk cannot indicate risk management effectiveness. Therefore, this study is also motivated to examine whether this purpose of improving risk governance has been achieved.

1.4 Contribution of the study

The contributions of this thesis are explored in more detail throughout Chapters Three and Four. Chapter Three presents the findings for the first objective, whilst Chapter Four presents the findings for the second and third objectives.

Generally, this study contributes to the literature by extending the existing literature (e.g. Cihak and Hesse, 2010; Abedifar et al., 2013; Beck et al., 2013; Mollah and Zaman, 2015; Mollah et al., 2017a) on corporate governance and the financial health of firms in several ways. Firstly, to our knowledge, this study is the first to examine the relationship between corporate governance and financial flexibility in the context of the banking industry and to compare the findings between CBs and IBs. Secondly, the study also methodologically contributes through its measure of banks' financial flexibility. In spite of the theoretical and empirical research on IBs' financial strength, no study has empirically investigated IBs'

conservative risk strategies for developing funding structures and liquidity policies. Therefore, the study examines the impact of the board of directors, the existence of a risk committee and the SSB on banks' financial flexibility by using a single index consisting of more than one perspective (i.e. funding structure, liquidity, and insolvency risks). This index was constructed by developing a mechanism that helps to assign scores to banks' level of financial flexibility.

Thirdly, the contribution of the thesis is related to the risk governance mechanisms' influence on corporate risk-taking. In more detail, the second objective contributes to the previous literature by studying the two most debated risk governance mechanisms (risk committee (RC) and CRO). Previous studies (e.g. Pathan, 2009; Erkens et al., 2012; Minton et al., 2014) investigated only board structures and its charactristics impact on bank risk-taking. However, this study employs a risk governance index consisting of two risk governance mechansims (RC and CRO) in investigating banks' risk-taking behaviour. The growig literature on the role of risk governance (e.g. (Aebi et al., 2012; Baxter et al., 2013; Al-Hadi et al., 2016; Nahar et al., 2016; Ames et al., 2018) investigate its impact on firm's performance, risk disclosure, and financial strength rating. Only a few studies have considered the influence of these risk governance mechansims on corporate risk-taking (Lingel and Sheedy, 2012; Ellul and Yerramilli, 2013; Hines and Peters, 2015). However, these studies consider some specific perspectives of risks (e.g. market and credit risks), whereas this empirical study takes into consideration five risk perspectives separately, as well as considering them in one single index (i.e. market, credit, operational, liquidity, and insolvency risks). Furthermore, this thesis is the first to consider the topic for two different types of banking system (Islamic and conventional). To the best of my knowledge, this is the first study to take into consideration the relationship between risk governance and risk-taking for both CBs and IBs.

Additionally, the thesis provides another significant contribution by evaluating the effect of risk governance on risk management effectiveness, and by drawing conclusions for both conventional and Islamic banks. Previous literature studied the relationship between risk governance and financial performance (Aebi et al., 2012; Nahar et al., 2016) and others studied the relationship between risk governance and risk-taking, as mentioned above. However, these links were investigated separately. This study distinctively examines the effect of risk governance on the association between risk-taking and financial performance (i.e. risk management effectiveness).

Lastly, the study covers the MENA region as the sample being investigation. This region consists of emerging countries where investors have less legal protection, which has led to an increase in asymmetrical information and contracting problems. These problems may affect corporate financial and investment decisions negatively (La Porta et al., 1997). Furthermore, as the MENA region is considered to be an emerging region, its ability to access external financing markets is low because of its highly volatile capital flows (Guo and Stepanyan, 2011; Agosin and Huaita, 2012). As a result, financial flexibility and effective risk-taking strategies in these countries are more desirable. Klapper and Love (2004) also state that the quality of corporate governance is more important in countries with weak legal environments. Therefore, investigating the MENA milieu might help us to understand how corporate governance mechanisms can mitigate banks' agency problems.

1.5 The Structure of the thesis:

The structure of the thesis is organised as follows: Chapter 2 provides an overview of the Islamic finance and banking systems. In this chapter, a discussion on the Shari'ah principles and a comparison between the characteristics of Islamic and conventional banks are provided. The chapter also presents definitions, theories, models, and types of corporate governance and risk management practices for the two banking systems. For coherency purposes, the three main empirical objectives of the thesis will be presented in two chapters. Chapter 3 presents the first empirical objective (Section 1.2.1) including a thorough literature review, hypothesis development, methodology, empirical results and discussion, and conclusion. Chapter 4 reports the second and third empirical objectives (Sections 1.2.2 and 1.2.3). Similar to Chapter 3, this chapter is also composed of a literature review, hypothesis development, methodology, empirical results and discussion, and conclusion. Lastly, Chapter 5 provides a conclusion to the whole thesis by summarising the main contributions and findings. This chapter also discusses the practical implications of the study and recommends a window for further research.

Chapter 2. ISLAMIC FINANCE - CORPORATE GOVERNANCE AND RISK MANAGEMENT ACROSS CONVENTIONAL AND ISLAMIC BANKING SYSTEMS

2.1 Introduction

This chapter explores three key aspects of this thesis. These are: the development of the Islamic banking system, corporate governance and risk management. The first aspect discusses the development and importance of Islamic banking in developing and developed economics. Furthermore, Islamic banks' (IBs) characteristics will be discussed to provide more knowledge about Islamic financial systems, along with an introduction to Shari'ah principles. In addition, there is a discussion about the differences between Islamic and conventional banks' characteristics, followed by details of bank's regulations.

In the second aspect, thorough information related to corporate governance, including its definitions and concepts, and its relevance in the banking sector, will be discussed in detail. Furthermore, this chapter introduces different corporate governance models, emphasising the unique Islamic governance model. The third aspect is divided into four sections. It starts with an introduction to the definitions and concepts of risk management, followed by different types of risk and discussions about their management. Subsequently, Section 2.5.3 presents the key participants in the risk management process. Moving on to Section 2.5.4, risk management from an Islamic perspective is illustrated.

2.2 Development of Islamic Banks

Islamic finance covers all the transaction types of financial intermediations (e.g. Islamic banking) and capital markets. The term 'Islamic finance' first came into use in the mid-1980s. Previously, it was called "interest-free". In the early 1960s, fully fledged interest-free banks were established in Malaysia and Egypt. Allegedly, those banks marked the birth of the Islamic banking system. Indeed, commercial banks only started to operate in the Middle East region in the early 1970s.

Table 2.1 summarises the historic development of IBs over time. In 1974, the Islamic Development Bank (IDB) was founded by the Organization of Islamic Countries (OIC). The goal of this bank was to enhance the economies in Muslim countries and support the development of banks that aimed to comply with *Shari'ah*. Following this period, the first commercial Islamic Bank, the Dubai Islamic Bank (DIB), was founded in Dubai in 1975

(Abdel Karim and Archer, 2002). Subsequently, several other IBs were also founded such as the Faisal Islamic Bank (Sudan), the Kuwait Finance House (Kuwait), Bahrain Islamic Banks (Bahrain) and Al-Rajhi Banks (Saudi Arabia). The early monopoly position of these banks provided them with comparative advantages throughout the development stage of the Islamic banking system. Responding to the great success of IBs, regulators started to encourage its expansion by providing new licences in this sector. For illustration, the Bahrain Central Bank posited a new framework to support Islamic institutions. This framework provided coverage for a number of areas, including capital adequacy, risk management and reporting issues. Furthermore, a number of organisations were established in Bahrain to support IBs' development, such the Accounting and Auditing Organization for Islamic Financial Institutions (AAOFIFIs) and the Islamic International Rating Agency (IIRA) (Central Bank of Bahrain Report, 2010). Archer and Karim (2002) argued that IBs are a creative and efficient alternative banking system that can operate the financial intermediation between economic surplus and deficit.

The sharp increase in oil prices in the early 1980s significantly boosted the accumulated wealth of the Middle East and supported the spread of IBs. During this period, some countries even converted their entire system to a fully Islamic banking system. For example, Iran and Sudan transformed their banking systems to an Islamic banking system in 1983 and 1984, respectively. Despite this period of development for IBs, they still suffered from poor investment opportunities (Cerović et al., 2017). Acknowledging the matter, CBs from the West took advantage of the funds available to IBs at that time and helped IBs to invest the money and carry out trade-related activities. Western banks detected the development of IBs and started to provide products that were compliant with Shari'ah principles through a separate department called the Islamic window.[4]

During the period between 2003 and 2009, this newly established banking system started to be accepted more widely by global market participants and some regulatory authorities, such as the Financial Services Authority (El Tiby, 2011). Subsequently, the Islamic financial system spread internationally to other countries such as Japan and Switzerland. Particularly in Japan, an Islamic portfolio for Mudariba was established by industrial banks. Also, a number of Japanese government banks such as the Bank of Japan joined the Islamic Financial

[4] The Islamic window is a department of conventional banks that provides products and services compliant with *Shari'ah* principles. Banks took that step due to the high demand for Shari'ah products and to maintain their clients. Banks in other countries such as the Middle East and other regions started to provide Islamic windows as well.

Services Board as an observer. Furthermore, during the same period, three IBs were granted authority by the FSA to operate in the UK. These banks were: the Islamic Bank of Britain (2004), the European Islamic Investment Banks (2006), and the Banks of London and the Middle East (2007).

The Period	Dates	Characteristics
Establishment	1965-1976	Major activities across the Muslim world in the area of research in all fields concern Muslims' daily lives. The establishment of a Muslim organisation to promote cooperation and support among Muslim countries. The establishment of several Islamic banks across the Muslim world.
The spread	1977-2002	Fuelled by the sharp increase in oil prices and the huge wealth in the Middle East, hundreds of Islamic banks were established across the globe. The transformation of the financial system to a complete Islamic banking system in Iran, Sudan and Pakistan.
International recognition	2003-2009	The global acceptance of Islamic banks by the Western and Recognition American regulators. The growing interest of international banks in Western Europe, the United States, and Japan in Islamic Finance.
The Evaluation	2009- Present	The large, healthy gross value of Islamic assets compared to the large decline in conventional banks' assets during the global crisis. Islamic banks were the least affected by the global crisis.

Table 2.1 The development of the Islamic banking system from 1965 to the present

Source: (El Tiby, 2011)

During the recent financial crisis in 2007, special attention was paid to IBs by global bankers, supervisors and regulators due to their surprisingly resilient performance. They stated that IBs were not seriously affected by the crisis compared to their conventional counterparts due to their real assets contract base (El Tiby, 2011). Therefore, at the end of 2009, IBs had dramatically grown in the global world – total asset values for the top 500 Islamic financial organisations significantly increased from US$639 billion in 2008 to US$822 billion in 2009,

representing an increase of 28.6%. The last decade could be considered as the global growth period for IBs. They showed the ability to grow across 75 countries from Africa, Asia and Europe to North America, even during the greatest financial tsunami (Khan and Bhatti, 2008). In particular, IBs' assets in the MENA region increased by 72% per year on average for the period from 2002 to 2008 (Ali, 2011).

The fast growth in Islamic banking proves the successful achievements of this system. By the end of 2011, the size of IBs had doubled compared to 2006, reaching the value of US$900 billion, accounting for more than 1% of the global banking sector (Financial Times, 2011). The Islamic banking growth continues and their asset value reached US$1.9 trillion in the early half of 2014 (World Bank and Islamic Development Bank Report, 2015). This fast growing industry was created by IBs' ability to add more ethical, competitive, flexible and diversified tools and systems to the global financial markets. Moreover, the different mechanisms of IBs make them directly involved with the borrowers' investments rather than being pure intermediates of financial capital. This motivates IBs to investigate borrowers' projects with high-standard tools since the bank is sharing the risk with its customers. Hasan and Dridi (2010) discuss a number of factors that contributed to the solid growth of Islamic institutions. These are: (1) the need in some Muslim countries for Shari'ah-compliant products; (2) the regulatory adoption of the Islamic finance system to cover the demand for Islamic products; (3) CBs' growing demand for Islamic products to provide diversified products for clients from different religious backgrounds; and (4) the need to develop new financial instruments to cover all the demand from investors (including both corporations and individuals).

2.3 Differences between Islamic and Conventional Banks

The banking sector is one of the most important financial sectors that can affect the economy domestically and internationally. The sector primarily comprises IBs and CBs. The main difference between the two bank types is that IBs have a different operational system and follow Shari'ah principles in processing their financial transactions and contracts. Shari'ah principles are the main law and moral values that Islam mandates to Muslims. Muslims interact with and apply these principles in their daily lives. Shari'ah not only consists of faith, but it also includes practices, including worship and individual attitudes and conducts. Shari'ah also extends its reach to dealing with laws and social norms, such as politics, crime, economics and many different matters related to family and individuals. Muslims extract the Shari'ah principles from two main sources: the holy book "Quran", which was given by god, and the *Sunnah*, explained by Prophet Muhammad (Elasrag, 2014). Furthermore, some

ambiguous cases are usually explained by Islamic jurisprudence, which is the process of interpretation of the law by humans. This is usually called *Fiqh, Ijmah* (consensus), and *Quays* (analogy reasoning). Given the growing significance of IBs, it is useful to describe some of the basic natures and characteristics of IBs and how these are different to those of CBs. As previously mentioned, IBs build their operations on *Shari'ah* principles.

2.3.1 Shari'ah principles

There are five main principles determined by Islamic law. (1) Contracts should be based on Profit and loss sharing (PLS) concept (equity-based contracts) where banks (the lenders) and investors (the borrowers) share the business risks and returns of funded projects (Greuning and Iqbal, 2008; Kettell, 2011). This principle enforces Islamic banks to solely base on financing instruments (contracts) that allow for "risk-sharing" rather than "risk-shifting" as being derived from the conventional debt financing instruments (Al-Suhaibani and Naifar, 2014). However, these contracts could also be provided on the liability side of a bank's balance sheet. One of the most important funding sources that is based on PLS is the profit-sharing investment account (PSIA). Archer and Karim (2006) explicate that IBs provide two different types of PSIA contracts: restricted and unrestricted. In the restricted PSIA, IBs do not account for the losses with investors, they just share the profits with them. In this PSIA type investors can choose the type of investment, and IB only provides administrative services. Nevertheless, if the PSIA is unrestricted, IBs invest the PSIA fund in the bank's assets pool and share both profits and losses, and investors have no right to choose the investment type. (2) Interest on loans and deposits is prohibited *(Riba)* (Greuning and Iqbal, 2008; Kettell, 2011), therefore deposits are free of interest. Social justice views are the underlying reasons for the prohibition of interest, which obliges both borrowers and lenders to share the profits and risks of a targeted business in an equivalent manner (Iqbal and Mirakhor, 2013). (3) All transactions should be made with real economically tangible assets. (4) *Qharar* (excessive uncertainty) and *mayser* (gambling) are prohibited (Obaidullah, 2005; Čihák and Hesse, 2010). (5) Some business types are prohibited in Islam such as companies involving alcohol, gambling and pork stores. Thus, Islamic banks are barred from trading in any financial transaction that involving those prohibited activities (Vogel and Hayes, 1998; Čihák and Hesse, 2010).

As Sharia's principles are considered as the core elements of the Islamic finance system, their implications on corporate governance structures and practices are imperative. Specifically, IBs governance practices have additional responsibilities such that all financial transactions and activities of the banks have to be compliant with shari'ah principles (Al-Suhaibani and

Naifar, 2014). In other words, the shari'ah principles might place some restrictions on banks operations, which would restrain the board of director from involving in a number of transaction and risk-taking activities (Mollah and zaman, 2015). Furthermore, corporate governance structures in Islamic banks are different from those of the conventional banks as they operate a multi-layer governance structure to monitor and oversee the Islamic banks' Shari'ah compliances. Particularly, Islamic banks must have an additional governance layer, i.e. the *Shari'ah supervisory* committee. The key role of this committee is to certify that the bank strictly complies with *Shari'ah* principles. Accordingly, the board members of this committee must acquire certain Islamic qualifications such as certificates in *Fiqh* and some finance-related degrees.

2.3.2 Other different characteristics of Islamic banks

Unlike CBs, IBs do not provide interest on deposits. They only provide demand deposit accounts and other Islamic bank products combining equity-based and debt-based contracts. Furthermore, Khediri et al. (2015) stated that "Islamic banks collect funds through demand deposits (guaranteed and yield no return) and investment deposits (similar to mutual fund shares and not guaranteed a fixed return). Islamic banks have developed interest-free financing products based on profit and loss sharing (PLS) and mark-up principles" (p.76). The financial contracts that IBs provide can be classified as either a liability (when they need funds) or an asset (when they invest funds) .These financial services include: (1) *Mudharabah* (profit sharing), (2) *Musharaka* (joint venture), (3) *Murabaha* (commercial funding with a profit margin), (4) *Ijar* (leasing), (5) *Wadeea'a* (safekeeping), (6) *Gard* Hassan (interest-free loans), and (7) *Sukuk* (Islamic bonds).[5]

The differences between IBs and CBs are not limited to the products they provide, but also management responsibilities and other factors. Unlike CBs, IBs have to consider many moral and ethical dimensions that are set by *Shari'ah* principles. Furthermore, the main purpose of CBs is to maximise shareholder wealth, the structure of risk management in CBs is highly

[5] (1) Mudharabah (profit sharing) is a financial contract that contains two parties (the fund provider and the investor), sharing the profits based on a fixed and agreed percentage. This type of contract allows only the fund providers to bear the potential losses of the investments. (2) Musharaka (joint venture) is a financial contract that allows parties to participate using equity. Those parties finance a project in agreed percentage of cash or any other kinds of funding sources. They both agree to share a proportion of the return and risk of the investment. (3) Mourabaha (commercial funding with profit margin) is a sales contract that includes the price of goods and the agreed profit margin between parties. This type of contract is close to the traditional capital gain that happens in sales markets, where the lenders ask to pay back the price of the good that the borrower wants plus the profit margin, which could be either cash or instalments. (4) Ijar (leasing) is a lease contract between two parties to use the fixed assets or services of certain goods for a specific period and price. Some of this type have the features to own the good the end of the contract. (5) Wadeea'a (safekeeping) is an account to save money for a certain period just like savings accounts but with no interest on the money. (6) Gardh Hassan (interest-free loans) is a completely interest-free loan contract. However, issuers of this type of services may charge a certain amount of money for the loan processing. (7) Sukuk (Islamic bonds) is a financial certificate confirming that one of the parties has the right to the investment capital and the profit.

developed and a number of advanced risk management models are put to use. In the case of IBs, IBs' risk management practices are still primitive with a lack of advanced models. Another different factor between IBs and CBs is deposit insurance, as IBs do not set insurance on the customers' deposits as this is against Islamic Law, whereas insurance deposits are mandatory for CBs. Similar concepts applied to insurance and hedging activities are also prohibited in IBs. Also, a well-structured money market is available for CBs, but the access for IBs is limited due to the Islamic restrictions. To summarise the differences between CBs and IBs, Table 2.2 presents the differences between these two types of banks.

Conventional finance	Islamic finance
Primarily based on Interest rate	Interest is prohibited
Facilitate financial activities	Facilitate social, economic and financial activities
Structured and formalised	Unstructured and still informal in many ways
Stress on financial efficiency	Stress on social, ethical and financial efficiency
Restricted moral dimension	Strong moral dimension
Highly systematised in terms of risk management, accounting and other standards	Standards for risk management, management, accounting and other activities are still developing
Existing set of legislations to deal with legal issues	Legal support still in development with several legal areas under doubt
Highly developed banking and financial product market	Developing banking and financial product market
Existence of conventional money market	Non-existence of significant Islamic money market
Availability of inter-bank funds	Non-availability of inter-bank funds
Strong and developed secondary market for securities	Non-existing secondary market for securities
Existence of short-term money market	Non-existence of short-term money market

Table 2.2 Differences between Islamic and Conventional banks

Sources: (Akkizidis and Khandelwal, 2008)

2.3.3 Regulations for Conventional and Islamic banks

Bank regulations are a form of government guidelines that expose banks to specific requirements and restrictions. The regulation is mainly designed by central banks. However, a number of central banks require banks to comply with new regulations that are released by the Basel Committee on Banking Supervision (BCBS). The aim of regulation is to ensure market

transparency between banks and other market participants and to eliminate any possible market failures and hence prevent economic crises. Beck et al. (2006) argue that tight regulation and supervision improve bank capital allocation, enhance competition, boost the performance and efficiency of banks, and reduce corruption. The banking regulations cover a number of aspects including capital adequacy, official supervisory power, market discipline, deposit insurance schemes and restrictions on bank activities.

Most countries' central banks adopt the international regulations released by BCBS in general, and they provide more specific regulations suitable for the conditions of the country. However, these regulations are mostly suitable for the conventional banks in these countries. It is challenging for IBs to comply with regulations set internationally by BCBS due to their different operating systems. However, as has been discussed in Section 2.2, a number of organisation have been established to enhance IBs' development, such as the Accounting and Auditing Organization for Islamic Financial Institution (AAOFIFIs) and the Islamic International Rating Agency (IIRA) in Bahrain. Some IBs follow the regulations of AAOFIFIs, whereas others follow the Islamic Financial Services Board (IFSB), which is based in Malaysia. The main roles of these regulatory agencies are to ensure the soundness and stability of the Islamic financial services industry. Furthermore, they enhance the Islamic financial industry by introducing international standards that comply with *Shari'ah* principles. These regulators and supervisory agencies complement the work of the Basel Committee on Banking Supervisory, the International Organization of Securities Commissions and the International Association of Insurance Supervisors. These organisations are also responsible for developing other aspects such as accounting, auditing, governance and ethics.

2.4 Corporate Governance in the Banking Sectors

Management plays a crucial role in achieving business goals, and the most important business objective is to maximise the wealth of shareholders. As there is a separation between the business owners (e.g. shareholders) and agents (e.g. managers), the owner's wealth maximisation goal may not be achieved as managers may act against the shareholders' interests. Such interest-conflicting behaviours of managers might damage the shareholders' confidence in the executive's management. Finance literature refers to this well-known phenomenon as the agency problem. Previously, a number of business have collapsed as a result of conflicts in management behaviour, for example Enron and the Bank of Credit and Commerce (Schwarcz, 2009). Therefore, a heated debate has arisen over the optimal methods to arrange the shareholder and management relationship and to guarantee the appropriate

usage by management of wealth and resources. As a result, the corporate governance and risk management concepts have been recognised as one of the best practices to solve this problem.

The corporate governance concept started to attract researchers and practitioners after firms' failures due to weak corporate governance. Furthermore, the concept will no doubt hold a more essential position within the banking industry as any bank failure can have serious adverse consequences for the whole region or worse, the global economy (Anderson and Campbell, 2004).[6] Iqbal and Mirakhor (2004) argue that corporate governance has received more attention due to the weaknesses of assigning an effective shareholder model of corporate governance, the growth of institutional growth, the shifting from a shareholder value model to a stakeholder model, and the globalisation effect on the financial markets.

2.4.1 Corporate governance conceptual definitions

Since the corporate governance leap in the 1980s, the corporate governance definitions have been delivered from a number of sources such as academics, economists, theorists etc. Turnbull (1997) argues that differences in culture contexts and the interests of scholars contribute to the various views on corporate governance. Therefore, corporate governance definitions can be seen from the point of view of different disciplines. In the sense of investment, Wójcik (2002) recognises corporate governance as how the incentives impact the management. Shleifer and Vishny (1997) recognise corporate governance from a narrower sense, which states that "corporate governance deals with the ways in which suppliers of finance to corporations assure themselves return on their investment" (p.738). From the board perspective, O'Sullivan (2000) views corporate governance as "concerned with the institutions that influence how business corporations allocate resources and returns. Specifically, a system of corporate governance shapes who makes investment decisions in corporations, what types of investments they make, and how returns from investments are distributed" (p.394). The Cadbury Committee (1992) and Monks and Minow (1996) also view corporate governance as a system of control, with the board of directors at the centre of the CG concept. The Cadbury Committee (1992) sees corporate governance as a mechanism to balance social and economic goals while at the same time it is a structure to enhance efficiency and accountability. Therefore, the obligation and decision-making structures of the firm can be considered as the

[6] A number of scandals and financial firm failures have occurred during the last 20 years, which in turn affected the region and the global economy. Examples of corporate failures are Barings banks in 1995, Credit Lyonnais in 1998, Northern Rock in 2007, and Madoff Securities and Lehman Brothers in 2008.

corporate governance mechanisms that form the rules and corporate policies to generate the firm performance.

The definition of corporate governance is more complicated in the financial sector. This is because of the different characteristics (e.g. high leverage and more regulated) and high complexity that the financial industry has. In detail, corporate governance in the financial industry extends its goals to cover all stakeholders. The Basel Committee for Banking Supervision (BCBS, 1999) defines corporate governance as the method through which the business and activities of institutions are monitored by its board and senior management, which in turn affects the way that stakeholder interests, corporate objectives and daily business are set. The aims of corporate governance from the perspective of banks are to assure the soundness of its financial system and its compliance with laws and regulations and to protect the stakeholders' interests. The notion of stakeholders is more extended in the financial industry as BCBS includes customers, depositors, suppliers, employees, supervisors, the community and government. In sum, corporate governance in the financial sector is different to corporate governance in other institutions as it needs to take into consideration a large group of stakeholders and to comply with external regulations.

2.4.2 Theories of corporate governance

This section aims to provide theories associated with corporate governance. In this section, agency costs, stakeholder, resources dependence, social norms, and institutional theories have been discussed. The rationales behind these chosen theories are because of (1) their common relations and applications in corporate governance studies and (2) their direct associations to the thesis. In the first empirical chapter, board of directors' structures have been considered as factors that assure the board of director's effective roles (i.e. monitoring and advisory). Agency theory mainly supports the roles of board of director in controlling and monitoring managers, thereby reduce agency costs (Brennan et al. 2016). However, the advising roles (strategy and service functions) are informed by resource dependence theory (Hillman and Dalziel, 2003; Pfeffer and Salancik, 2003). One of the most important aspect of this thesis is Islamic corporate governance (will be discussed later in section 2.4.3.5), which tends to adopt the stakeholder view theoretically. It also supports the social moral and norms of the society. Thus, stakeholders and social norms theories should be discussed. Another important aspect of this thesis is the risk governance mechanisms (i.e. separate risk committee and chief risk officer), which is studied and investigated in the second empirical chapter. Risk governance is created as consequences of a number of external pressures (e.g., regulators) on corporate

governance mechanisms - related to risk management practices, which could be supported by institutional theory.

2.4.2.1 Agency cost theory

The separation between ownership and management is the main concept that the agency theory is built on. Thus, this theory treats the conflicts of interest (Shileifer and Vishny, 1997) derived from the manager's incentive to maximise his personal wealth at the expense of the owners (Tricker, 1994). Specifically, managers may exploit their power to not benefit the principal interests (Jensen and Meckling, 1976). However, Jensen (1986) argues that managers can privately benefit from using the free cash flow surpluses when there is no effective monitoring.[7] To tackle this issue, creating a governance board that monitors the management's decisions, and making sure that these decisions adhere to the interests of the principal are considered effective solutions (Allen and Gale, 2000). Consequently, the board of directors contributes to reducing the agency cost (Fama, 1980; Fama and Jensen, 1983; Shleifer and Vishny, 1986; Williamson, 1988; McKnight and Weir, 2009).

2.4.2.2 Stakeholder theory

Unlike the agency cost theory, the stakeholder theory extends attention to the conflicts of interest that might be raised between managers and other stakeholders who also add to the firm's achievements (Cyert and March, 1963; Mintzberg, 1983; Freeman, 1994; Freeman, 2010). The stakeholder theory's definitions cover the firm's shareholders, creditors, employees, suppliers, customers and communities. Freeman (2010) argues that the term 'stakeholders' can be applied to any group of individuals that can affect or are affected by the firm's activities and decisions. Specifically, meeting the stakeholders' interests is very important for the firms to be able to effectively accomplish their activities (Clarkson, 1994). Furthermore, Clarke (1998) argues that "The attenuation of shareholders' roles in managing business and the rise of professional management is associated with growing recognition of the significance of the role and the contribution of other stakeholder groups to the performance of the company" (p.183). This is more pronounced for the banking sector considering its complexity and its effect on economic growth. Jurgens et al. (2010) argue that most of the European corporate governance models (bank models) are supported by the stakeholder theory. Thus, the bank's corporate governance mechanisms should rely more on the stakeholder view since banks have a special stakeholder group, comprised of regulators, bondholders, depositors and other stakeholders. Moreover, the stakeholder theory is the most

[7] A number of previous studies have assured this relationship (e.g., Harford 1999; Dittmar and Mahrt-Smith 2007; Harford et al., 2008).

appropriate view for IBs because of its ability to consider ethics and to address moral values related to other stakeholders while managing the firm. Consistent with the agency theory, the governance board also enhances the compliance with the stakeholders' interests. The stakeholder theory suggests that independent directors can make important judgements on corporate decision making, increase the monitoring of managers' behaviour, and, thus, enhance stakeholders' interests (Rosenstein and Wyatt, 1990).

2.4.2.3 Resource dependence theory

Pfeffer and Salancik (2003) explain the resource dependence theory, which states that the firm can be viewed as an open system. In more detail, the resource dependence theory assumes that the firm needs to understand the environmental factors that can affect its success and how to work in that environment (Pfeffer, 1972). Therefore, based on this theory, the firm needs to adapt effectively to external interdependencies to be able to survive (Hillman et al., 2009). Pfeffer and Salancik (2003) discuss how the board of directors work as a linking channel between the firm and external organisations in order to solve environmental dependencies. The authors provide four essential benefits for this linkage. However, Hillman et al. (2000) develop the four primary benefits and suggest that diversity of director types enhances the benefit of a variety of resources to the firm. The diversification of the board can be accomplished by increasing the board size and independent fractions, which increases the expertise and knowledge on the board. Therefore, the board of directors can provide much stronger monitoring and advice for the management, which will enhance the firm's performance and value.

2.4.2.4 Social norms theory

Individual behaviour, investor preferences and financial decisions are significantly influenced by social norms (Kübler, 2001; Kim and Venkatachalam, 2011; Baker and Nofsinger, 2012). However, social norms refer to a number of aspects around our lives such as ethics, environment and faith. A number of social norms studies define acceptable norms based on what is acceptable in certain religions, and how they affect individual behaviour (e.g. Halek and Eisenhauer, 2001; Barro and McCleary, 2003; Hilary and Hui, 2009). Therefore, firm behaviours should represent the individual characteristics by appreciating their norms, values and attributes. This view can be applied to IBs, as IBs should not engage in any prohibited activities that conflict with *Shari'ah* principles. AAOIFI also assures that social and religious dimensions need to be considered by IBs. They state that the chief objective should be to fulfil the stakeholders' wishes by conducting financial operations in compliance with

Shari'ah principles. With regard to this theory, the Islamic governance mechanism (SSBs) can play a crucial role in meeting the required norms that the banks have to follow.

2.4.2.5 Institutional theory

The institutional theory focuses on institutionalised pressure groups and public opinion and how these factors impact the firm structures (Meyer and Rowan, 1977; Oliver, 1991). This thesis focuses on the perspective that takes the institutional system as a "class of element" even though there are a variety of perspectives for the institutional theory. This perspective was developed by Scott (1987), who proposed that firms derive benefits from creating internal structures in response to external institutional pressures. In other words, firms develop an internal structure in order to increase their legitimacy, resources and ability to survive (Meyer and Rowan, 1977; DiMaggio and Powell, 2000). However, DiMaggio and Powell (2000) claim that coercive isomorphism, which is derived from the external regulatory-type pressures for organisational convergence, leads institutions to be similar to each other in the same environment. More specifically, regulators determine procedures, rules and structures for organisations in order to provide legitimacy and support (Meyer and Rowan, 1977). This theory could be used to understand the development in corporate governance structure. Specifically, firms improve their risk governance mechanisms, creating a dedicated board level risk committee and assigning a chief risk officer, in order to meet the regulatory pressures that demand more monitoring and management over the risk management process.

2.4.3 Corporate governance models

Models of corporate financing are an essential element that determines corporate governance (Okabe, 2004). Two categories of financial systems define the corporate governance models. These are market-based and bank-based systems (Okabe, 2004). A number of corporate governance models have been founded under these two categories. Previous studies (e.g. Clarke and Chanlat, 2009; Hassan, 2009; Hasan, 2011) compare four different corporate governance models, namely the Anglo-Saxon model, the Germanic model, the Japanese model, and the Islamic model.

2.4.3.1 The Anglo-Saxon Model (market-based model or principle-agent model)

This model is the most distributed corporate governance model. The two most advanced countries that use this corporate governance model are the UK and the US. The model is important for corporations as it defines corporate goals in order to maximise shareholder

wealth.[8] It assigns a number of legal rules and polices to the board of directors and executive officers to comply with shareholders' interests. Evidently, this corporate governance system is mainly built to protect the shareholders' interests and rights (Pearson, 2010). Moreover, this model is primarily motivated by profit-oriented manner.

The fiduciary relationship between the shareholders and managers is the main corporate concept that the Anglo-Saxon model adopts (Clarke and Chanlat, 2009). Hence, it is well-matched with the agency theory, which was developed by American financial economists in the 1970s. Cernat (2004) illustrates the structure of the Anglo-Saxon model, which is presented in Figure 2.1. This figure shows how the board of directors behave as agents to guard the shareholders' interests and rights.

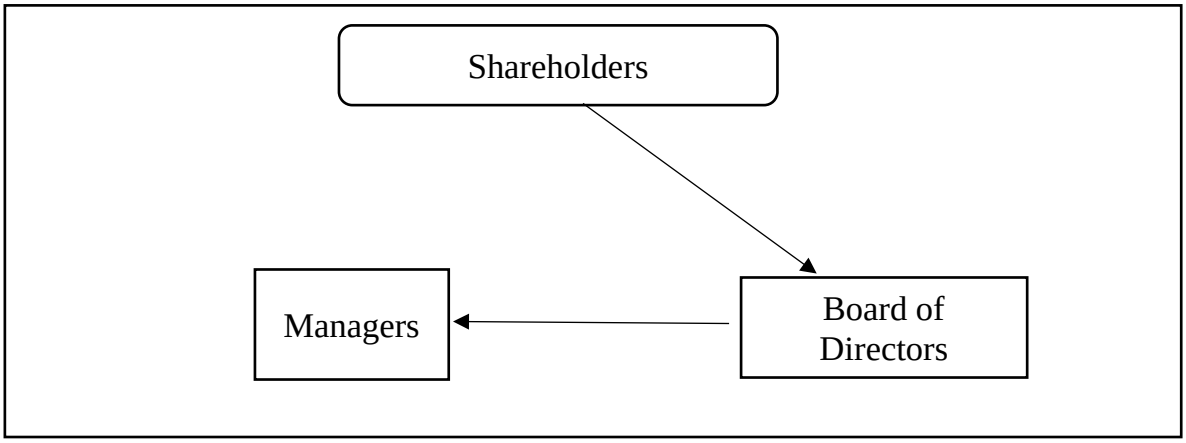

Figure 2.1 The Anglo-Saxon Model
Source: (Cernat, 2004)

2.4.3.2 The European Model (The stakeholder model)

Some scholars criticise the principle-agent system as it does not address the agency problem effectively (Macey and Miller, 1997). Thus, a new model has been developed, which is the European model or the stakeholder model, to overcome the limitations and problems in the Anglo-Saxon model. This corporate governance system was proposed by Clarkson (1995) and Donaldson and Preston (1995), who claim that the interests of all stakeholders rather than just shareholders should be considered. This model has proven its validity in industrial societies as it successfully builds a trusting relationship between stakeholders and management, which enhances positive investment and mutual beneficial exchange (Jones, 1995).

[8] There are differences between US and UK corporate governance systems even though both countries use the Anglo-Saxon model. While 75% of S&P 500 companies in the USA have one person holding both Charmian of BOD and CEO positions, most UK companies separate these roles (Keenan, 2004). Also, in the UK most firms assign an additional executive director besides the Chairman, CEO, and CFO, while this practice is rare in the US (Keenan, 2004).

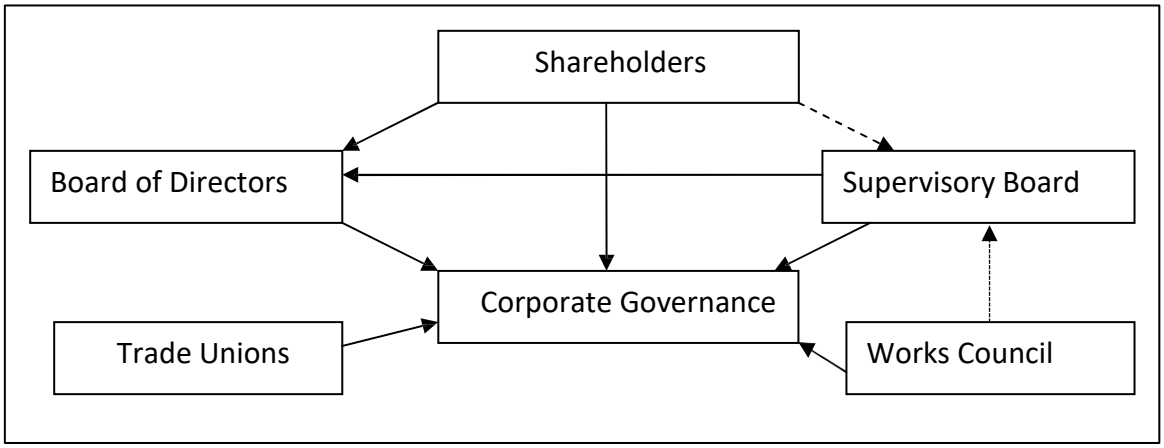

Figure 2.2 The European model of corporate governance

Source: (Cernat, 2004).

Figure 2.2 depicts the structure of the corporate governance for the European model. Its function is based on a two-tier board system, management and supervisory boards. The management board is elected by the supervisory board, and the shareholders and employees have the authority to elect the supervisory board (Tricker, 1994; Schilling, 2001). A number of board members hold the identities of shareholders, work council representatives and trade union members. The responsibility for managing the firm's business to meet all the stakeholders' rights and interests belongs to the management board, while the supervisory board is responsible for advising and monitoring the management board's behaviours (Schilling, 2001).

2.4.3.3 The German model

As stated before, corporate governance models can be categorised into two main systems, the market model and bank model. The German model of corporate governance is classified under bank-based systems of corporate governance. The German model operates under the two-tier board system and tries to maximise all the stakeholder values (Sadowski et al., 2000; Goergen et al., 2005). This model supports the bank's power to control the firm as it promotes the adoption of the universal banks concept, which refers to the bank having a large proportion of members on the board because of its high ownership stake. Goergen et al. (2005) argue that the "German regime is characterised by the existence of a market for partial corporate control, large shareholders, cross-holdings and bank/creditor monitoring, a two-tier (management and supervisory) board with co-determination between shareholders and employees on the supervisory board, a non-negligible sensitivity of managerial compensation

to performance, competitive product markets, and corporate governance regulations largely based on EU directives but with deep roots in the German legal doctrine" (p.2).

2.4.3.4 Japanese model of corporate governance

This corporate governance model is also categorised under the bank-based model, as it considers the bank as a controlling shareholder and a powerful monitoring element and intervention (Okumura, 2004). This model promotes the efficient allocation of shareholders' and stakeholders' resources (Allen and Zhao, 2007). The Japanese model affects the corporate governance structures and objectives by focusing on protecting the loan portfolio quality for bank shareholders and maximising wealth for corporate shareholders (Yoshikawa and Phan, 2005). Banks play a crucial role in governing companies' lending channels. In brief, this model is very similar to the European model with a greater concentration on the debt-financing system as the power to control the firm.

2.4.3.5 Islamic corporate governance (ICG)

2.4.3.5.1 Overview: Conceptual frame work

Unlike conventional corporate governance, a paucity of literature exclusively evaluates ICG even though Islamic finance has been growing rapidly globally (Yunis, 2007). Theoretically, Islamic corporate governance (ICG) can be defined as the mechanism to direct, manage, govern, and control the corporation through a corporate governance structure, which aims to protect all the stakeholders' interests, achieve the firm's objectives, endorse social responsibility, and comply with *Shari'ah* principles. Furthermore, the Islamic Financial Services Board (IFSB, 2006) defined ICG as:

> a set of organizational arrangements whereby the actions of the management of IFIs are aligned, as far as possible, with the interests of its stakeholders; provision of proper incentives for the organs of governance such as the BOD, *Shar*i_*ah* board, and management to pursue objectives that are in the interests of the stakeholders and facilitate effective monitoring, thereby encouraging IFIs to use resources more efficiently; and compliance with Islamic *Shar*i_*ah* rules and principles (p.27).

The IFSB's definition illustrates the actual framework of Islamic corporate governance. Specifically, it provides the essential elements of corporate governance framework besides the requirements of complying with *shari'ah* principles. The first part of the definition clarifies the main practical objective of corporate governance as a set of relationships between the institution stakeholders. The second part of the definition assures the need to integrate the

requirements of the *shari'ah* compliance. The second part clarifies why the conceptual framework of Islamic corporate governance is distinctive.

ICG is distinctive as it sets Islamic norms and morals as the highest priority, whilst stakeholder interests come after that to ensure that human affairs are achieved (Choudhury and Hoque, 2004). Archer et al. (1998) argue that IBs' managers are obliged to achieve the corporation objectives, i.e. maximising shareholders' values, in a *Shari'ah*- compliant manner. With no doubt, it is complicated to incorporate Islamic values into conventional corporate governance as it is hard to minimise the transaction costs, achieve the corporate goals, and comply with *Shari'ah* Law at the same time (Choudhury and Hoque, 2006). During the previous decade, a number of Islamic institutions failed to operate their business successfully because of the weak corporate governance system.[9] This confirms the urgent need to develop an efficient corporate governance system for Islamic financial institutions (IFIs) in which all the Islamic concepts are sufficiently covered. Thus, a number of authorities i.e. AAOIFIs and the IFSB, were assigned to issue Islamic governance codes and guidance to be employed in IFIs.

Building on the conventional models and taking into account the unique agency issues faced by IFIs, a number of researchers recommend an additional distinctive governance mechanism. Generally, compliance with *Shari'ah* Law is the main agency issue that governance structures need to consider in IFIs. Thus, the conceptual framework of Islamic governance has been conducted from two different perspectives: *Tawhid* and *Shura*. Choudhury and Hoque (2004) refer the theory of ICG to the epistemology of *Tawhid* (Oneness of God). Choudhury and Hoque (2006) also discuss the *Tawhid* epistemology as a theoretical framework that is effective in structuring ICG and supporting the decision-making process. Figure 2.3 illustrates the corporate governance framework in the Islamic context. This figure explains the *Tawhid*- and *Shura*-based approaches. A number of ICG definitions agree with this approach. For example, Ibrahim (2006) views ICG as having all the transactions comply with Shari'ah principles. Figure 2.3 illustrates that the *Tawhid* epistemology is the base root that ICG relies on, whereas corporation roles rely on Shari'ah Law. The concept behind this epistemology is that it brings the vicegerency (*Khilafah*), trust (*amanah*), and justice (*aladl wal ihsan*) morals in the institution operating system. Stakeholders as religious believers have the fiduciary duty to support these morals/principles by authorising the *Shura* group. As stated before, the ICG

[9] A number of Islamic Institutions failed including Ihlas Finance House in Turkey, the Islamic Bank of South Africa, the Islamic Investment Companies of Egypt, Dubai Islamic Bank, and Bank Islam Malaysia Berhad.

system is also based on *shuratic* decision making, *hisbah* and *Shari'ah* auditing (Rahman, 1998). *Shuratic* decision making is a process whereby the members of the board discuss between them certain issues and they have to vote on them to make the decision (*Ijmah*), which enhances the moral value.

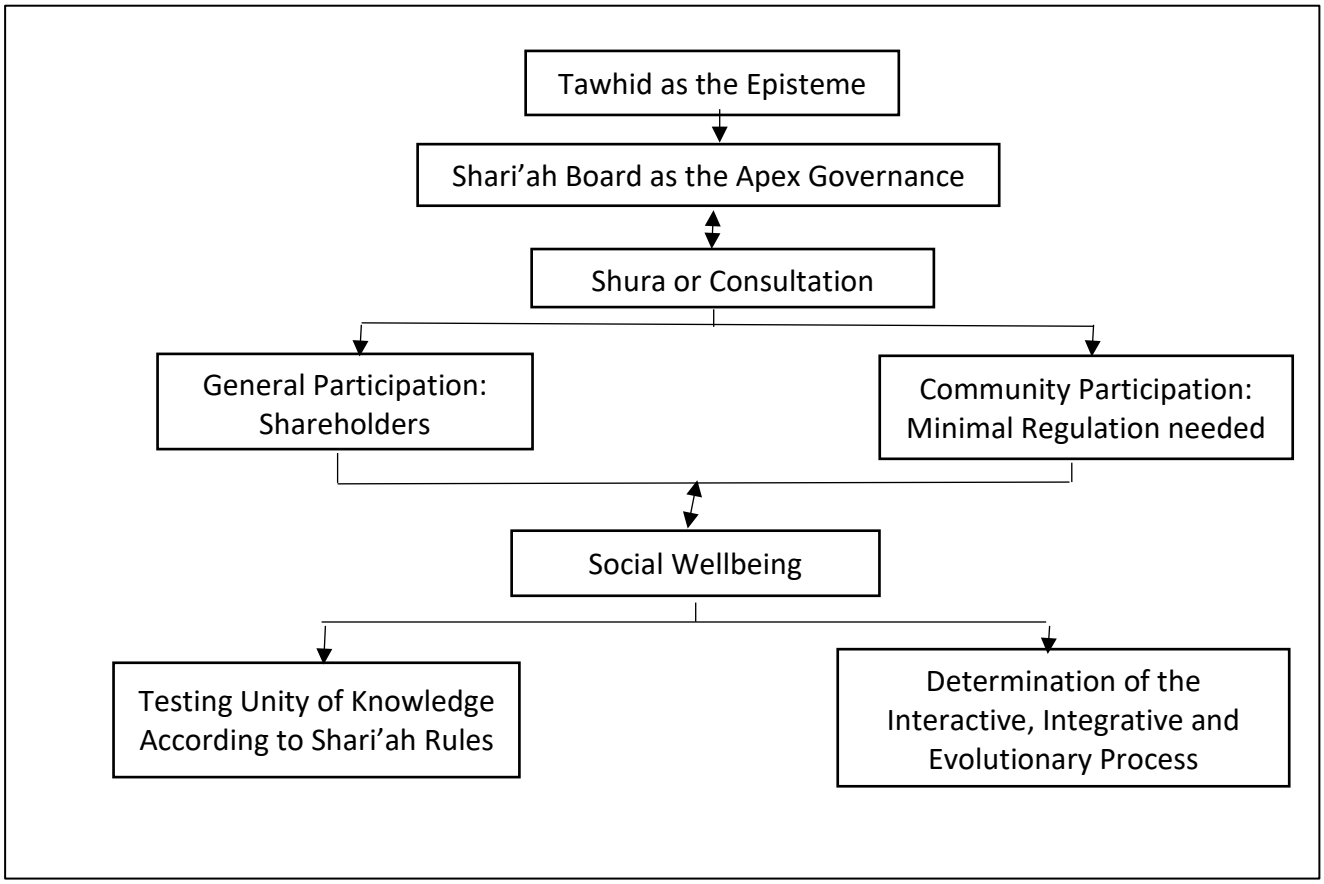

Figure 2.3. Islamic Corporate Governance Based on Tawhid and Shura Approach.

Source: (Choudhury and Hoque, 2004)

The *Tawhid* approach illustrates the theoretical foundation of Islamic corporate governance. However, this epistemological foundation seems to be ambiguous in terms of how it could be implemented in corporate governance systems. Hassan (2009) argues that the *Tawhid* approach is vague as there are no clear mechanism for the implementations of corporate governance practices in real-world settings. Furthermore, the majority of IFIs seem to follow the conventional epistemology bases of corporate governance models (e.g. the shareholder model), with relying on the shari'ah supervisory board (Hassan, 2009). Iqbal and Mirakhor (2004) criticise the *Tawhid* approach, and consider the compliance with *Shari'ah* to be one of the stakeholders' rights, and thus support the stakeholders' value system as a structure for the ICG model.

Another unsolved gap in the *Tawhid* approach is the relation with Investor Account Holders IAHs, as IFIs may only share the profits in IAH contracts, but they may not share the risks and losses. In addition, institutions do not allow IAHs to be part of the management of the fund that they provide. Hence, IAHs do not have the right to control the cash flow (Safieddine, 2009). Therefore, managers in IFIs might have opportunities to acquire personal benefits at the expense of IAHs' interests (Abdel Karim and Archer, 2002; Archer and Karim, 2006). Acknowledging this agency matter, researchers recommend a mechanism to mitigate the gap between IAHs' control and cash flow. Archer et al. (1998) suggest that shareholders can act to protect the IAHs' benefits by preventing the management from exposing the fund to high-risk projects, given that these shareholders can increase their own profits by attracting more IAHs. As a result, an Islamic governance framework has been proposed by Asri and Mohamed (2004) to address this issue by creating a group of *Shura* consultants. This group includes representatives of shareholders, the board of directors, the SSB, the public and creditors. Grais and Pellegrini (2006a, 2006b) suggest that similar to shareholders, unrestricted IAHs should be granted a representative on the board as a communication channel to discuss their demands and concerns, as well as approving their involvements in the management of the institutions.

2.4.3.5.2 The additional corporate governance layer: Shari'ah Supervisory Board (SSB)

Researchers argue that the role of board governance is to increase the governance practices in IFIs. Grais and Pellegrini (2006a) argue that the board of directors is responsible for two mains roles. First, it needs to reassure the stakeholders that the institution is fully compliant with *Shari'ah* Law.[10] Second, it needs to ensure the IFIs' growth, efficiency, soundness and stability. Regarding the first role, IFIs need to have specialised scholars in *Shari'ah*. Therefore, an additional layer of ICG was created, i.e. the *Shari'ah* supervisory board (SSB). International organisations, researchers and scholars emphasise that the primary role of SSBs is to reassure the stakeholders about the Islamic institutions' compliance with *Shari'ah* principles (Abdel Karim and Archer, 2002; Caruana, 2005). Safieddine (2009) argues that the board of directors relies on the SSB to make decisions and to acquire the trust of stakeholders regarding the compliance with *Shari'ah* principles.

Principle 13 of IFSB (2006) requires IFIs to set up a SSB and to allocate at least three members to monitor and oversee the IFIs' transactions and to ensure the application of

[10] Stakeholders in Islamic Financial Institutions include customers, depositors, regulators, governments, employees, communities, environments, and shareholders (IFSB, 2006). Furthermore, IFIs have another type of stakeholders, Investment Account Holders (IAHs).

Islamic concepts. In more detail, SSBs' functions include two roles: advisory roles and supervisory roles. The advisory role is to advise the IFIs' board of directors and to manage their operations and all *Shari'ah* aspects of financial contracts and transactions. On the other hand, the supervisory role includes the monitoring of *Shari'ah* contracts and financial transactions. As a result, effective Islamic and *Shari'ah* governance systems will enhance the customers' confidence and mitigate *Shari'ah* compliance risks, which eventually contributes to the growth and stability of IFIs.

The SSB's authority allows them to restrain the board of director activities under the *Shari'ah* monitoring concept. Figure 2.4 depicts the Islamic governance framework based on the SSB authority approach (multi-layer governance). This approach argues that the SSBs have supervisory authority above the board of directors, driven by *Shari'ah* Law. As can be seen from the figure, SSBs prohibit boards from issuing credit against credit, due to the *Riba* concept (prohibition of interests) and also from any involvement in doubtful investment products (*Ghara*) such as CDS. Furthermore, contributing to social justice and avoiding high risk-taking and poor-quality lending are expected behaviours of boards in IBs due to the religious beliefs and commitment to ethics (Mollah and Zaman, 2015).

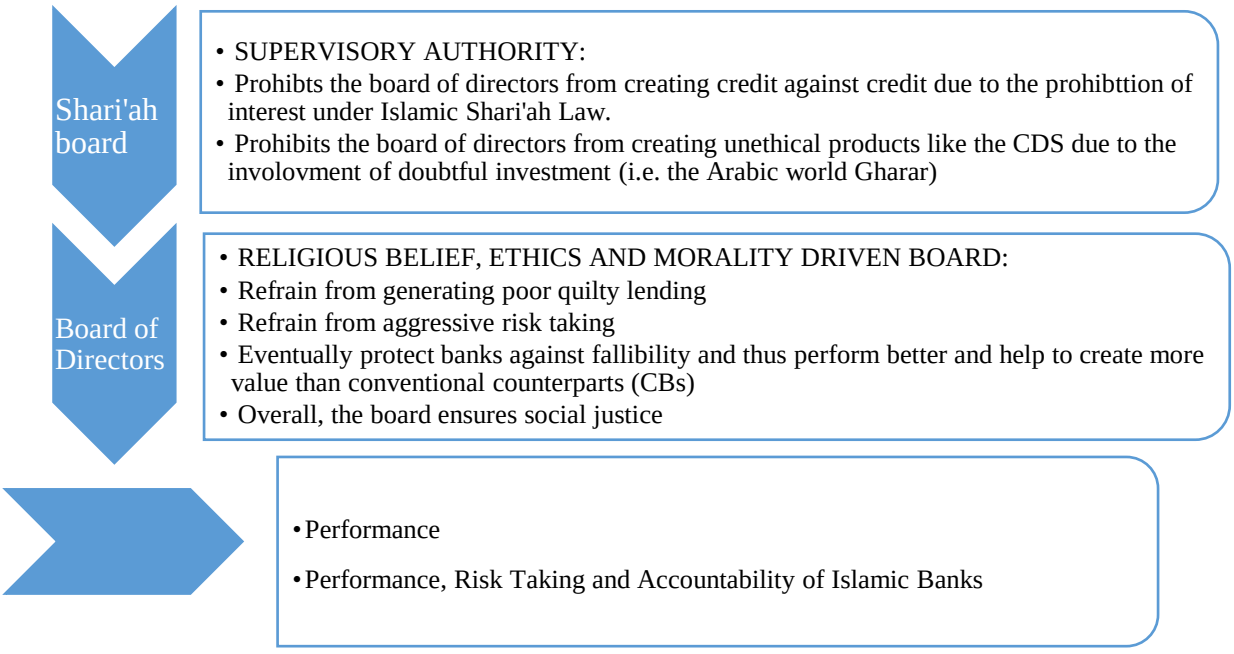

Figure 2.4 Islamic Corporate Governance based on multi-layer framework

Modified Source: (Mollah and Zaman, 2015)

2.4.4 Comparing corporate governance models

This section presents a comparison table between the various corporate governance models that have been discussed earlier in this chapter. This helps to gain an understanding of the differences between these models, comparing Islamic governance with the conventional models. Table 2.3 shows the details of various corporate governance models.

Aspects	**The Anglo-Saxon**	**The European/ German**	**Japanese model**	**Islamic model**
Theory orientation	Shareholder	Stakeholder	Stakeholder	Stakeholder
Episteme	Rationalism and rationality	Rationalism and rationality	Rationalism and rationality	"Tawhid"
Objectives				
Rights and interests	To protect the interests and rights of the shareholders	The right of the community in relation to the corporation	The right of the community in relation to the banks	To protect the interests and rights of all the stakeholders but subject to the rules of Shari'ah
Corporate goal	Shareholders controlling managers for the purpose of shareholders' profit	Society controlling corporation for the purpose of social welfare	Society controlling corporation for the purpose of social welfare	Acknowledgement of being profit oriented but balanced with the Shari'ah objective and principles
Nature of management	Management dominated	Controlling shareholder dominated	Controlling shareholder dominated	Concept of vicegerency and 'shura' process
Management boards	One-tier board	Two-tier board	Two-tier board	Two-tier board Shari'ah board as ultimate governance
Capital related and ownership structure	Widely dispersed ownership; dividends prioritised	Banks and other corporations are major shareholders; dividends less prioritised	Banks are key shareholders. Strong bank-corporation relationship; dividends less prioritised	Shareholders and depositors or investment account holders; dividends are less prioritised

Table 2.3 Comparison between corporate governance models

Sources: (Clarke and Chanlat, 2009; Hassan, 2009; Hasan, 2013)

2.5 Risk Management from both Conventional and Islamic Perspectives

The risk-return trade-off is a common financial concept that most academics and market practitioners utilise. Although researchers and practitioners usually refer to the main objective of corporations as maximising return, the precise objective statement should be "to maximise return for a certain level of risk". Corporations should acknowledge the importance of returns alongside with good risk management. In practice, many examples illustrate that corporations poorly manage, or in some cases ignore, the risk aspects in their operations, causing catastrophic financial consequences. This risk management concept is particularly critical in the banking industry due to its important role in the whole financial system. In the recent financial crisis, banks were blamed for taking excessive risks due to their weak risk management system and lack of solid corporate governance (Kirkpatrick, 2009). Tao and Hutchinson (2013) argue that the failure of one financial institution in the crisis was likely to be contagious to others and hence increase the probability of their failures. Aebi et al. (2012) discuss the growing need for strong risk management techniques and structures after the 2007 crisis and the subprime US crisis. Therefore, regulators and other authority organisations have put downward pressure on financial institutions' boards of director and senior management to improve the governance and risk management structures so that they may withstand such shortcomings (Greuning and Iqbal, 2008).

2.5.1 Risk management concepts

Uncertainty and volatility are terminologies that can be used to define risk (Artzner et al., 1999). Furthermore, DeLorenzo (2006) defines risk as the uncertainty of future events and how different decisions can bring different outcomes. However, the process of managing risk is more comprehensive, as the management should identify the risks and use certain strategies and tools to minimise them. Pyle (1999) states that the risk management process involves the management identifying the key risks, determining the probability/likelihood of certain types of risk, and establishing mechanisms to monitor and control the results of that risk. In general, the process of risk management comprises several main components, which are: risk identification, risk assessments, risk estimations, measuring risk, risk monitoring and risk mitigation.

The risk management process in financial institutions is more complicated due to the special types of risk that they encounter. Therefore, risk management in financial institutions can be seen as more than just a process, but a business strategy. There are more aspects to managing risk in financial institutions, as banks need to recognise the importance of managing compliance, financial, hazard, operational, and strategic risk in a comprehensive manner and

assigning these actions to the risk enterprise's framework and risk appetite (Randeva et al., 2014). Ardrey et al. (2009) define banks' risks management as a process of monitoring and controlling the business transactions using a set of policies that can influence the banks' operations and effectively identifying, managing and mitigating the banks' risks. There are two perspectives that can explain the risk management process in financial institutions. These are: regulatory requirements and voluntary risk management practices. Under regulatory requirements, banks have to follow the risk management guidelines issued by the local regulatory bodies. Furthermore, a well-developed risk management system has to be set by the bank to monitor and mitigate risks effectively (Talwar, 2011).

Regulatory requirements emphasise the importance of the risk management process of banks. The Basel Committee on Banking Supervision (BCBS, 2011) confirms that risk management has four main perspectives: (1) risk identification (e.g. market risk, operational risk, and credit risk etc.); (2) risk assessment using risk models; (3) timely monitoring and measuring risks; and (4) risk control by senior managers. However, regulators enhanced the risk management requirements and guidelines as a result of the recent financial crisis (Mongiardino and Plath, 2010).

Notably, risk management in banks is more associated with corporate governance as the latter involves a number of decisions relating to risks. Thus, it could be said that poor corporate governance might be related to an ineffective risk management process. There are five types of decision-making processes that might influence risk management quality (Clark and Urwin, 2008). These are: strategic decision making, structural decision making, operational decision making, tactical decision making, monitoring and oversight decision making.

2.5.2 Types of risk

Risks are divided to two main categories: market risks (systematic/un-diversifiable risk) and financial risks (unsystematic/diversifiable risk) (Santomero, 1997). This section will introduce the five most common types of risk that are considered in financial institutions, and also the five risks being studied in this thesis. Furthermore, the Islamic banking and finance implications on these risk types will be discussed as well.

2.5.2.1 Credit risk

Credit risk can be defined as the probability of parties failing to pay back a financial contractual obligation. Crouhy et al. (2006) define credit risk as "the risk of loss following a change in the factors that drive the credit quality of an asset" (p.14). Richard et al. (2008)

argue that credit risk is categorised as one of the most important risks in the banking sector. Previous literature (Barnhill Jr et al., 2002; Bratanovic, 2003) mentioned that bank failures in general and in the recent financial crisis in particular are mainly caused by weak credit risk management. According to capital requirements released by Basel II, credit risk is the most crucial risk that needs to be considered when calculating the capital adequacy ratio (Abu Hussain and Al-Ajmi, 2012). There are five well-known factors that are used to assess credit risk, which are: capital, collateral, cash flow, character and conditions (Heffernan, 2005; Jesswein, 2008; Richard et al., 2008).

Credit risk is also a common risk in Islamic bank. The Islamic financing contracts (e.g. *Mudharabah* (profit sharing), *Musharaka* (joint venture), *Murabaha* (commercial funding with a profit margin)) are also subjected to customers failures to fulfil their obligation toward the contractual terms. As discussed in section 2.3.1, Islamic banks financing contracts must be based on a Profit and loss sharing (PLS) principle. However, PLS financing contracts increase the overall level of assets risk even though they transfer the direct credit risk from the Islamic banks to their investment depositors. This is because PLS financing contracts make IBs vulnerable to risks that are carried by equity investors instead of debtholders (Cihak and Hesse (2010)). Moreover, IBs are not allowed to use hedging tools to avoid credit risk (e.g. credit derivatives), which will contribute to a higher default risk and longer delays in repayments (Chapra and Ahmed, 2002; Sundararajan, 2007).

2.5.2.2 Market risk

Market risk is the systematic risk that is not avoidable or diversifiable because it is generated by factors that affect the overall market performance rather than specific companies/ industries. Beaver et al. (1970) state that market risk could be seen as the risk that occurs due to stock market price movements, which are more related to banks' financial portfolios. Bessis (2015) recognises market risk as the losses from the balance sheet and the consequences of market price movements. The market risk is subject to a number of other types of risk (i.e. interest rate, equities, exchange market and commodities risks) (Bessis, 2015).

Market risk in IBs may arise from fluctuations in tradeable, marketable, and leasable asset values (Greuning and Iqbal, 2008). In particular, the risk might arise from any financing contract that includes future delivery or deferred payment (Iqbal, 2013). Unlike Conventional banks, IBs are prohibited to earn profits from speculative transactions and contracts that

involve incidence or non-incidence of future events (e.g. hedging or derivatives) (Haron and Hock, 2007).

2.5.2.3 Liquidity risk

Liquidity risk, a bank's ability to meet short-term obligations, is dramatically important for financial institutions. Based on the financial intermediation theory, the provision of liquidity and financial services are the two most important elements for financial institutions, especially banks. However, since financial institutions are working as an intermediation channel that needs to balance deposits and loans, they might face a number of liquidity problems (risk). BCBS (2008b) states that banks tend to transfer short-term deposits into long-term loans, which makes them subject to liquidity risk. In more detail, banks face regular and irregular demands for deposits and the latter might cause a liquidity problem if do not have enough cash to meet the depositors' demands (BCBS, 2008a). The liquidity risk of financial institutions is related to two aspects: funding and assets (Crouhy et al., 2006; Bessis, 2015).

Many recent financial problems that have occurred during the last decade such as the US deficit problems (2004-2005) and the global financial crisis (2007-2009) were directly linked with liquidity problems. Therefore, there is a critical need for liquidity risk management to maintain the banks' soundness. A weak liquidity position and poor liquidity risk management might expose the banks to other types of risk such as fiduciary risk and displaced risk, and may subsequently influence the bank's financial stability (Mohamad et al., 2013). Consequently, the Senior Supervisory Group (2009) recommended that banks develop their liquidity risk management by setting up a comprehensive approach. Greenbaum et al. (2015) argue that banks can manage their liquidity risk using a number of approaches such as investing in liquid assets, expanding funds from different depositors, and maintaining a reserve at the central bank to borrow from when necessary.

Liquidity risk is classified as one of the most serious risk faced by IBs (Sundararajan, 2007). In the events of liquidity distress, IBs might be suffered from higher liquidity risk compare to CBs because of the *Shari'ah* law constraints on accessing short wholesales financing (e.g., certificates of deposits) and other interest-based funds (Safiullah and Shamsuddin, 2018). Furthermore, the heavy reliance on asset-based financing is considered as another reason of why IBs are exposed more to liquidity risk (Basher et al. 2017).

2.5.2.4 Operational risk

The risk of losing as a result of failed internal processes, systems and people, including fraud, assets damage, business disruption and legal risk is called operational risk (BCBS, 2011). Operational risk is managed differently depending on the bank's size and complexity; more complicated banking businesses need a stronger operational risk management framework. Ghosh (2012) argues that banks need to manage the operational risk independently to be able to accurately identify, monitor, assess, control and mitigate these operational risks.

Besides the conventional sources of operational risk, IBs exposes to an additional source of operational risk that arises from failures in complying with Shari'ah requirements (Chapra and Ahmed, 2002). Operational risk in IBs might make fund providers to withdraw their funds, which results in diminished reputation, loss of income, and limited business opportunities (Iqbal, 2013). Cihak and Hesse (2010) states that there are complexities being derived from administration of PLS modes, which assure the importance of managing the operational risk in Islamic finance. Due to IBs complexity model, younger age and smaller size of IBs might have a higher cost structure, greater administration, and operating cost, which result in higher operational risk for IBs compare to CBs (Beck et al., 2013; Johnes et al., 2014; Rashwan and Ehab, 2016).

2.5.2.5 Insolvency risks

Insolvency risk is defined as the risk of having the value of the bank's assets drop below their liabilities value. Banks' insolvency is inversely related to banks' financial stability, as a higher insolvency risk indicates the lower financial stability of the bank. Boyd and Graham (1986) and Hannan and Hanweck (1988) argue that insolvency risk is essential in assessing banks' risk and their overall financial stability. Insolvency risk is also known as default risk. A number of banks have failed as a result of weak risk insolvency management. García-Sánchez et al. (2017) argue that managing the insolvency risk is important in financial institutions as failing to manage such risk is costly at the micro- and macroeconomic levels.

Insolvency risk exposure might be different for IBs because of their unique business models. The nature of PLS contracts make investment depositors bear the financial risks with the banks. This feature increases the IBs ability to absorb losses and reduce the cash flows volatility, which result in a reduction in insolvency risk levels (Safiullah and Shamsuddin 2018). Nevertheless, IBs might be risker because of the *Shari'ah* principles prohibitions from utilizing interest-based wholesale funding and traditional risk hedging tools, and investing on some activities, which in turn makes IBs more exposed to insolvency risks (Abedifar et al. 2013, Beck et al. 2013).

2.5.2.6 Shari'ah risk (Shari'ah compliancy risk)

As stated earlier, IBs possess unique characteristics with complicated business model because of the *Shari'ah* requirements. Consequently, IBs should not involve in activities that violate the *Shari'ah* principles *as* stakeholders of IBs may react negatively otherwise. Ali (2003) discussed that IBs that violate the *Shari'ah* principles face excessive withdrawals of deposits. Thus, besides other conventional types of risks including market, credit, operation, liquidity and insolvency risks, IBs are exposed to an additional risk – *Shari'ah* risk (Shari'ah compliancy risk). *Shari'ah* risk is the risk of not being compliant with the *Shari'ah* principles (Iqbal, 2013). Archer and Haron (2007) also define *Shari'ah* compliancy risk as the banks' exposure to failure because of violations of *Shari'ah* principles. They argue that IBs deviation from *Shari'ah* principles might face the risk of credibility loss, which can damage the bank's overall reputation. Ginena (2014) discusses that deviation from *Shari'ah* principles (*Shari'ah* risks) can cause various dangers. These are credit, legal, reputational, and market risks, which in turn leading to serious problems such as withdrawal of funds, higher costs of attracting deposits, direct and indirect financial losses, liquidity issues, bank runs, bank failures, and financial instability. IFSB (2005) argues that violating *Shari'ah* requirements have a strong influence on the bank's market position, liquidity, solvency, and profitability.

2.5.3 Risk management key participants

2.5.3.1 Board of directors (BOD)

The board of directors is responsible for a number of roles in financial institutions, and one of their most important roles is managing institutional risks. In general, the BOD's responsibilities include ensuring the safety and soundness of the bank's operations and activities and the solvency of the financial system. Furthermore, the BOD is responsible for monitoring and protecting the bank from any unwanted risks. The risk management roles of the BOD are monitored by regulators. BCBS (2010a) emphasises that the BOD's responsibilities with regard to risk management include approving and overseeing the risk objectives, risk strategies such as risk tolerance and risk appetite level, senior managers' activities, and corporate governance issues. BCBS (2014a) updated the principle codes for this responsibility of BODs, in which it states that the BOD is accountable for developing risk appetite by considering the regulatory requirements and long-term interests of shareholders, and, along with senior managers and the Chief Risk Officer (CRO), it is responsible for enhancing the bank's ability to manage risk. The board should approve and monitor the application processes of internal controls, the liquidity plan, and capital adequacy assessment for the bank.

The BOD's responsibility also includes ensuring that the necessary actions are taken by the management department to identify, control, measure, and monitor the risk exposure. However, the management should also inform the BOD on a regular basis of all risk type statuses through reports (Khan and Ahmed, 2001; Ghosh, 2012; FSB, 2013).

2.5.3.2 Senior managers

The responsibilities of senior managers come after the board's roles, as the management has to apply the policies installed by the board. The senior management is also accountable for developing the risk management policies and procedures such as the risk management process, setting risk-taking limits, the system of risk measures and internal risk control. Furthermore, they are responsible for setting up mechanisms or procedures to ensure that the objectives installed by the board are achieved.

2.5.3.3 Risk committee

The risk committee's responsibilities and activities have increased after the recent crisis. Regulators have put more pressure on banks to create a separate risk committee that has full responsibility for overall risk in the banks. The risk committee is a sub-committee of the board and it specialises in managing risks. The committee's responsibilities include advising the board on overall risk tolerance, risk appetite and risk polices. They also monitor the senior management's application of the risk strategies set by the board of directors. They report to the BOD and/or CEO regarding this issue. Furthermore, the risk committee communicates directly with the risk management enterprise department and the CRO (BCBS, 2010). The risk committee should discuss the business unites' performance, their compliance with risk appetite, and risk restrictions set by the BOD with the CRO and senior management through regular meetings (FSB, 2013). The risk committee is responsible for overseeing the risk management framework implementation and providing recommendations about optimal risk strategies.

2.5.3.4 Enterprise risk management department

The enterprise risk management department is accountable for detecting, controlling, monitoring, measuring, mitigating and reporting risk to the senior managers (FSB, 2013). This is a separate department that controls all the bank's risk management enterprise. BCBS (2010) confirms that the department is independent from the institution, and is responsible for applying the risk management framework across the entire institution, ensuring compliance with the risk strategies set by the BOD. The responsibilities of this department are to monitor

and evaluate the risk profile on a daily basis (Baxter et al., 2013), and to implement all the risk policies including market, credit, and liquidity risks.

2.5.3.5 Chief Risk Officer (CRO)

The role of the CRO also received more attention after the recent financial crisis. Regulators revealed a number of ways to improve the risk management function in financial institutions. BCBS (2010) states that the role of the CRO is independent, and that this person is responsible for the overall risk management functions and framework of the bank. FSB (2013) argues that monitoring risks and the risk process are the responsibility of the CRO, as this ensures that the BOD and senior management have sufficiently addressed the risk relevance and risk profile in a timely manner. The CRO is distinct from the business lines and can report directly to the BOD or to the CEO. Furthermore, the CRO might be a member of the risk committee or have a direct link with the RC. In addition, fundamental decisions regarding risk setting, plans, strategies, funding and liquidity management are also areas where the CRO is involved.

2.5.4 Risk management from Islamic perspectives

Risk management is considered as an important factor of the IBs success and sustainable growth (Obaidullah, 2002; Greuning and Iqbal, 2008). As previously stated, IBs have different characteristics and adopt the two corporate governance layer approach. As a result, risk management might also be different from that operating in CBs. In more detail, risk dynamism, risk management and risk mitigation are not the same in IBs. Furthermore, while CBs utilize risk-transfer, IBs strongly support the risk-sharing (Iqbal, 2013), which is considered as the main difference between IBs and CBs in risk management. Mirakhor and Krichene (2010) argue that from an economic point of view, the *Shari'ah* law supports the risk sharing and prevents risk transfer /shifting by prohibiting the interest-based contracts. Risk-sharing features make IBs less vulnerable to instability than CBs (Ali, 2007). However, even though this feature supports IBs stability, IBs could be risker and more vulnerable than CBs as a number of conventional hedging instruments cannot be employed.

PLS contracts might increase the risk level at IBs as they are difficult to monitor. Akkizidis and Khandelwal (2008) discuss that there is no standardisation in the way of financing project in IBs, which is considered as another factor that makes IBs risker. Furthermore, the scarcity of legal requirements in controlling the relationship between the banks and entrepreneurs and the absence of a short wholesales funding market for Islamic finance make IBs to be more vulnerable (Akkizidis and Khandelwal, 2008).

IBs tools in mitigating and managing risks are limited due to the *Shari'ah* principle restrictions (Ahmed and Khan 2007). Furthermore, the IBs unique risks (as discussed in section 2.5.2) assure the needs to develop more hedging instruments that do not violate the *shari'ah* rules. Ahmed and Khan (2007) argue that IBs' unique risks are complex and difficult to mitigate for several reasons. First, IBs are highly exposed to market risks in addition to credit risks because of their trading-based instruments and equity financing. Second, risk in IBs combine and alter from one type to another during different stages of the transactions. For instance, IBs might be exposed to credit risk during the period of Salam contracts, whereby the IBs are exposed to commodity price risk at the end period of the contracts. Finally, IBs risks are hard to mitigate because of the rigidities and deficiencies in the Islamic finance infrastructure.

Another difference in risk management between IBs and CBs is regarding the risk-taking behaviour. There are two extremes of risk strategies that Islam prohibits: (1) excessive risk-taking and (2) risk avoidance. For example, *Shari'ah* principles prohibit *gharar*, *riba*, and *mayser*, which do not allow IBs to engage in any excessive risk-taking or risk avoidance activities. Obaidullah (2002) argues that risk management in Islamic finance might accept risk-taking and uncertainties, yet major elements (e.g. *gharar*, *riba*, and *mayser)* must be strictly prohibited.

Even though a number of studies (e.g. Obaidullah, 2002; Iqbal and Mirakhor, 2007; Hassan, 2009) agree on the importance of risk management elements for IBs, IBs face some difficulties in pursuing Islamic risk management (Iqbal and Mirakhor 2007). IBs' risk management is in its early stages and is still under development since it is missing the depth and breadth of risk management tools. This affects the risk governance practices in IBs. Compared to CBs, IBs possess similar key participants in risk management, as mentioned in Section 2.5.3. However, the key participants in risk management in IBs have additional responsibilities besides the conventional one; that is accomplishing their roles in a manner that is compliant with *Shari'ah*. Nevertheless, because of the additional risk (*Shari'ah* risk), IBs should improve their risk management system by having a more comprehensive risk management and reporting procedures that include the *Shari'ah* board to oversee the risk profile and identify, measure and monitor risks. Greuning and Iqbal (2008) discuss the increasing need for IBs to have a more comprehensive risk management framework to be able to compete in the market. BCBS (2006) requests that the BOD and senior management approve the risk management process. However, this risk management process should be

compliant with *Shari'ah* principles and relevant risk issues should be reported to the supervisory authority (IFSB, 2005).

2.6 Conclusion

This chapter provided the background and all the basic knowledge required to approach and understand this thesis. The chapter explained the history of Islamic finance and its development. It also discussed the Islamic law, and differences in characteristics between conventional banks and IBs, as well as banks regulations. Furthermore, this chapter presented the corporate governance concepts, theories, and models and compared them to the Islamic governance model. More explanation is provided in a discussion of the SSB within the Islamic banking system. Moreover, the chapter also examined risk management from both conventional and Islamic perspectives as this is a key element in the thesis. Risk management conceptual definitions have been given to provide initial ideas about risk management before discussing the risk types and the key participants in the risk management process.

Chapter 3. Governance Structure and Financial Flexibility: A Comparison Study of Banking Systems

3.1 Introduction

The banking industry has captured the attention of academics and practitioners due to its unique characteristics and financial practices when compared with other unregulated firms (Adams and Mehran, 2003). Alongside the conventional banking system, there is a noticeable surge in the Islamic banking industry in Western countries (Khan and Bhatti, 2008) assuring increased demand for Islamic financial instruments and the industry's economic resilience.[11] After the financial crisis of 2007-2008, researchers increasingly focus on the Islamic banking system's durability because of its surprisingly resilient performance during the crisis (Hasan and Dridi, 2010; Beck et al., 2013; Mollah and Zaman, 2015). Accordingly, many studies e.g. (Cihak and Hesse, 2010; Abedifar et al., 2013; Farooq and Zaheer, 2015; Khediri et al., 2015; Alqahtani et al., 2017) investigate the financial health of the Islamic Banks, including their stability, efficiency, insolvency risk, and liquidity management. They aimed at determining the differences in financial systems of the Islamic banks and conventional banks, which may explain the better performance of Islamic banks during the crisis. However, despite studying different aspects of banks' financial health, the literature has not yet considered banks' financial flexibilities. In addressing this research gap, this study examines the effects of corporate governance structures on financial flexibility for both types of banks. We utilise the Islamic banking model, operating on an extended governance structure (i.e., *Shari'ah* supervisory boards–SSB), to offer insights into identifying the influence of banks' institutional characteristics and additional monitoring mechanisms on financial flexibility.

The financial flexibility of a firm can be defined as its ability to fund positive net present value projects and avoid financial risk (distress) (Bonaimé et al., 2013; Ferrando et al., 2017). According to current literature (DeAngelo and DeAngelo, 2007; Gamba and Triantis, 2008; Mittoo et al., 2011; Meier et al., 2013), more financially flexible firms are more likely to survive in periods of economic stress. Billett and Garfinkel (2004) show that US banks with more financial flexibility have greater values. It appears that the same principle may apply to banks such that financial flexibility could alleviate ongoing investment issues and help banks avoid financial distress. In this study, the financial flexibility of banks is determined using

[11] The growth rate of Islamic banks is 50% faster than the overall banking sector, and the average annual growth rate was 17.6% from 2008 to 2012. Also, the financial assets of Islamic banks are expected to reach US$ 3.4 trillion by 2018 and US$ 6.5 trillion by 2020 (Ernst and Young, 2013).

two main properties: funding and liquidity positions relative to targeted ratios. Banks with more stable funding sources (e.g. core deposit) and more liquid assets tend to be more financially flexible. Although financial flexibility is not directly observable, it can be inferred from the amount of reserves that a bank holds to monitor and limit financial risk and develop profitable growth strategies.

This research examines the impact of banks' governance practices on their financial flexibility. The main research question is constructed to investigate two main mechanisms: setting the risk-taking policies and monitoring. Firstly, corporate governance may affect a bank's financial flexibility through the risk-taking strategy (risk management) that a bank adopts in developing its financial policies. Therefore, influencing the two main properties of financial flexibility, funding and liquidity. High risk-taking in either or both of these policies would result in lower reserve of funding and liquidity, a bank's financial flexibility would be reduced accordingly. Secondly, the agency theory of Jensen (1986) suggests that higher monitoring power of a bank tends to reduce its agency costs through the reduction of managers' ability to exploit the bank's financial sources. As a result, a bank's financial flexibility might be maintained. Furthermore, the literature shows that strong corporate governance enhances the monitoring power of a firm (Harford, 1999; Dittmar and Mahrt-Smith, 2007; Harford et al., 2008). Consequently, effective corporate governance can improve the financial flexibility.

We examine the influences of unique aspects of banks' governance systems (board of directors and board risk committees of both banking systems and the SSB of Islamic banks) and their effect on financial flexibility for 28 Islamic banks and 37 conventional banks in 11 Middle East and North Africa (MENA) countries between 2009 –2015. To our knowledge, this study is the first to examine this relationship for both types of banks. This cross-banking examination is essential due to differences between the two banking systems. Most noticeably, Islamic banks offer *Shari'ah* compliant financial contracts and have an additional layer of board governance, the SSB.

We construct a measure of financial flexibility as a single index consisting of more than one perspective (funding structure, liquidity and insolvency risks). This index uses a mechanism that allows us to allocate scores to a bank's financial flexibility. We employ a sample that covers the MENA region. This region has the highest concentration of IBs in the world, and comprises emerging countries where investors have less legal protection, which has led to a

higher level in asymmetric information and contracting problems. La Porta et al. (1997) discussed that less legal protection might cause a negative effect on the corporate financial and investment decisions. Ferrando et al. (2017) argue that firms in countries with less legal protection would value their financial flexibility more highly. This because firms in these countries have a high volatility in their capital flows, which will affect their ability to access external financial markets (Guo and Stepanyan, 2011; Agosin and Huaita, 2012). Therefore, investigating the MENA milieu might help us understand how corporate governance mechanisms can mitigate banks' asymmetric information problems as well as affect their financial flexibility.

We conclude that while a larger board size is positively related to conventional banks' financial flexibilities, it is negatively associated with that of Islamic banks. These different board size effects can be explained by three main characteristics of Islamic banks: *Shari'ah* compliance risk, lack of protection for stakeholders' rights, and a lower level of complexity. The results also suggest that the existence of a dedicated risk committee improves conventional banks' financial flexibilities, but it does not affect Islamic banks' financial flexibilities. Furthermore, we find that the more effective the SSB, the better the Islamic bank's financial flexibility. Larger SSB comprising members with multi-membership bring their accumulated knowledge and experience to improve the quality of monitoring processes.

This research has implications for banks and their regulators. By showing that a board's effectiveness enhances the bank's financial flexibility, both types of banks should determine their board size and composition effectively to ensure effective monitoring and advising functions. Banks should also implement a risk governance approach to mitigating bank risk taking. Furthermore, as an additional monitoring mechanism that seems to have a positive added value for Islamic banks (i.e., the SSB), conventional banks could consider implementing an additional controlling instrument for improving corporate governance practices. Likewise, Islamic banks and their regulators should pay more attention to the SSB's structure and function, as its malfunction might negatively affect bank reputation and client trust. Although the Basel Committee on Banking Supervision recently increased the capital requirements for banks by applying Basel III and released new liquidity requirements for banks, the regulators may consider targeting banks' governance mechanisms to enhance the resilience of their financial systems and operations.

The rest of this paper is organised as follows: Section 3.2 presents the literature review and hypothesis development. Section 3.3 shows the data and methodology. The results and empirical analysis are presented in Section 3.4. The final section concludes this paper.

3.2 Literature review and hypothesis development

Bank corporate governance has not been well researched since the majority of the previous literature tends to exclude banks (Adams and Mehran, 2012) in spite of their unique position in financial practice. In essence, the bank as a financial institution is very different from unregulated firms (Adams and Mehran, 2003). It operates in an extensively regulated environment due to its high leverage level and potential for contagion within the banking industry, as well as its significant influence on the real economy (Elyasiani and Zhang, 2015). Drawing from the uniqueness of bank governance, Elyasiani and Zhang (2015) suggest that "the effects of bank boards on banking firm performance and risk may be dissimilar to their effects on nonfinancial firms and, hence, worthy of special attention" (p.239). Furthermore, the banking industry is subject to not only the conventional agency problems that firms are exposed to, but its unique agency costs derived from managers' duty to protect the interests of different capital providers (Safieddine, 2009). Indeed, banks are susceptible to higher agency costs due to a lack of transparency in their contracts, higher leverage (Mehran et al., 2011), and higher information asymmetry between managers and shareholders (Morgan, 2002).

Governance in Islamic banking, although similar to the Anglo-American model, is perceived as being stronger with the additional layer of monitoring in the form of religious or ethical boards – the so-called *Shari'ah* supervisory board (SSB) (Elnahass et al., 2014; Mollah and Zaman, 2015; Abdelsalam et al., 2016). In Islamic banks, the agents are required to adhere to the Islamic principles of *Shari'ah* when fulfilling their missions to maximise shareholder wealth (Safieddine, 2009). The stakeholders' interests in Islamic banks may extend beyond financial interests to ethical and religious values (Alnasser and Muhammed, 2012). Any divergence by Islamic bank agents from placing all of their supplied funds in *Shari'ah*-compliant investments creates an additional source of problems for them (Safieddine, 2009). These agency conflicts increase further due to the different operations of Islamic banks involving a variety of stakeholders and contract structures, thus causing the managers to use their discretion when using the various stakeholder funds. For example, one of the main agency problems that Islamic banks face is related to investment account contracts. Investment accounts in Islamic banks are based on profit sharing and loss bearing (*Mudarabah*) or profit and loss sharing (*Musharaka*) contracts because of the prohibition on

paying interest as a return (*riba*). This provides Islamic banks with more legal liberties (Abdelsalam et al., 2016), whereby Islamic banks engage in investments and share the profits with investor account holders (IAHs) based on the overall profits that they achieved. This increases the possibility of manipulating the returns for the IAHs, as argued by Safieddine (2009). In the case of *Mudarabah* contracts, the losses are borne only by the depositors, which may increase the moral hazards, as banks can take greater risks and leave the IAHs, who have no control over investment decisions, to bear this risk (Aggarwal and Yousef, 2000; Belal et al., 2015).

3.2.1 Board of directors' effectiveness and financial flexibility

As mentioned earlier, the financial flexibility of a bank comprises two main properties: funding and liquidity, which can be influenced by the bank's risk-taking strategies in regards to financial policies and monitoring channel. Firstly, previous studies have suggested that firms can improve their financial flexibility by following conservative risk strategies when determining financial policies (i.e., policies related to funding and liquidity) (DeAngelo and DeAngelo, 2007; Gamba and Triantis, 2008; Denis, 2011).[12] Applying these findings to the banking industry, the risk-taking policies that managers follow in funding and liquidity influence a bank's financial flexibility. For example, if a bank follows a low-risk funding policy such that it depends mainly on core deposit (stable funding sources), its funding position is more likely to be higher relative to its target. In other words, the bank is more financially flexible. The previous literature (Bologna, 2011; Cornett et al., 2011; Oura et al., 2013; Jung and Kim, 2015) shows how stable funding increases a bank's ability to operate and encounter risks even during times of crisis. A similar mechanism is applied to low-risk liquidity policies. The Basel Committee on Banking Supervision (BCBS, 2014) and the Islamic Financial Services Board (IFSB, 2015) assure that effective liquidity risk management can increase a bank's resilience.

Secondly, a bank's financial flexibility can be influenced by their monitoring channel. According to the agency theory (Jensen, 1986), a strong monitoring system prevents managers from exploiting a firm's financial sources. That prevention might positively affect the financial flexibility of the firm. After banks decide on their optimal financial policies, the managers of banks are expected to adhere to those policies to meet the banks' objectives.

[12] Conservative risk strategies can be identified by having more reserves of cash and /or stable funding than the industry average or clear optimal targets in financial policies. In other words, the conservative risk strategies in this paper stand for conservative financial systems.

However, due to conflict of interests between different agencies, there are incentives for managers to take advantage of the bank's financial sources for their private benefits. Therefore, a slack monitoring network within banks due to weak corporate governance mechanisms may provide managers with more opportunities to take private benefit using free cash flow (Harford, 1999; Dittmar and Mahrt-Smith, 2007; Harford et al., 2008). Consequently, if managers act against the established conservative funding and liquidity policies, banks' financial flexibilities might be reduced.

As explained above, banks' risk-taking policies and monitoring power can influence their financial flexibility. The study initially proposes that the board effectiveness enhances banks' financial flexibilities through these two channels. Building on agency theory, an extensive body of literature states that effective corporate governance reduces agency costs (Fama, 1980; Fama and Jensen, 1983; Shleifer and Vishny, 1986; Williamson, 1988; McKnight and Weir, 2009). Notably, the structure of the board of directors is one of the most important corporate governance mechanisms that can improve a firm's performance (Cadbury Committee, 1992). According to Brennan et al. (2016), the board's roles involve (i) the controlling function, informed by agency theory and (ii) the strategy and service functions, informed by resource dependence theory (Hillman and Dalziel, 2003; Pfeffer and Salancik, 2003). Additionally, the board is the "*professional referee*" (Fama, 1980) (p.293), serving as a monitoring agent that has a legal and moral obligation to align management and shareholder interests (Fama and Jensen, 1983).

Boards may effectively influence both risk strategies (through financial policies) and agency costs. These links are well-established in the literature. For the former, some previous studies (McCrae and Balthazor, 2000; Kaen, 2005; McNulty et al., 2013) discuss the link between risk management and corporate governance. Dionne (2004) and Karim et al. (2014) suggest that the effectiveness of a bank's governance can be inferred from the effectiveness of its capital risk management. Furthermore, Yun (2008) and Caprio et al. (2011) suggest that stronger corporate governance leads to more efficient financial policies (i.e., more liquid asset reserves) For the latter, the link between the board of directors and agency costs, the literature (Harford, 1999; Dittmar and Mahrt-Smith, 2007; Harford et al., 2008) asserts that managers can gain private benefits by using free cash flow when corporate governance mechanisms are weak. According to La Porta et al. (1997), an effective board may prevent managers from exploiting their firm's financial resources and maintain a good financial reserve position. Moreover, the previous literature shows that a more effective board enhances a firm's ability

to reduce the agency costs of debt financing (Lorca et al., 2011; Fields et al., 2012). As such, we propose that a more effective board improves the bank's risk-taking policies and the monitoring system within the bank. Consequently, the bank becomes more financially flexible.

H1: There is a significant relationship between board effectiveness and financial flexibility.

3.2.2 Board of directors' effectiveness in Conventional and Islamic banks

The board is responsible for a bank's soundness and safety through its two fundamental roles: monitoring and advising (Adams and Mehran, 2003). It is the body that is ultimately accountable for liquidity risk management at a bank (BCBS, 2008b). The theoretical and empirical literature recommends that these two board roles can be made more efficient by adjusting the board's size and composition (Raheja, 2005; Harris and Raviv, 2006; Adams and Ferreira, 2007; Boone et al., 2007; Coles et al., 2008; Linck et al., 2008; Lehn et al., 2009; Pathan and Skully, 2010; Adams and Mehran, 2012). In other words, the board's size and composition significantly affect the effectiveness of the board.

However, the direction of the established significant relationship between board effectiveness and firm value is challenged by Coles et al. (2008). In detail, Coles et al (2008) discuss that based on firms' characteristics, board effectiveness is determined differently. In this paper, we further hypothesize that board effectiveness is determined differently for conventional and Islamic banks. Therefore, the standard definition of board effectiveness for conventional banks is not able to explain the manifestation of financial flexibility for Islamic banks. This might be due to their unique characteristics, as previously discussed. Although the boards of Islamic banks are also responsible for monitoring their managers' decisions to protect other stakeholders, their missions and functions are more challenging compared to those of conventional banks due to the different operations and contractual frameworks within Islamic banks. Below, we discuss the hypothesized direction of the relationship between board effectiveness and financial flexibility, separately for conventional and Islamic banks.

For conventional banks, a large body of literature has shown that a higher number of board members with a greater proportion of outsider directors can lead to much stricter controls and better advice on a bank's management, thus improving the board's effectiveness see (Boone

et al., 2007; Singh et al., 2018). However, the advisory role of the board has received less attention than its monitoring role. Dalton et al. (1999) argue that, in general, a larger board gives better advice to the CEO, an effect which is increased by the higher proportion of expert and knowledgeable outsiders. The rationale is that independent directors prevent private benefits of insiders, thus enhancing stakeholder interest and firm performance (Rosenstein and Wyatt, 1990; Pathan and Skully, 2010; Harford et al., 2012). Moreover, higher percentages of outside directors leads to larger board sizes causing board diversification, subsequently enhancing the board's monitoring role (Harris and Raviv, 2006; Boone et al., 2007). Hillman et al. (2000) suggest that having different kinds of directors enhances a firm's benefits through accessing various external resources. Overall, a higher number of board members with a greater proportion of outsider directors can lead to much stricter controls and better advice on a bank's management, thus improving the board's effectiveness. Nonetheless, the situation is different for Islamic banks, where a larger board with a greater proportion of outsider directors is often associated with less board effectiveness (Mollah and Zaman, 2015; Mollah et al., 2017b). This is because of a number of reasons.

Firstly, Islamic banks' corporate governance structures and agency costs are significantly affected by the differences in their financing and investment models, contracts, and business models (Abdelsalam et al., 2016). In addition to the shareholder and regulatory requirements, the boards of Islamic banks must act in accordance with *Shari'ah* requirements (Safieddine, 2009). Non-*Shari'ah* compliant Islamic banks are exposed to excessive withdrawals of deposits (Ali, 2003). Ginena (2014) suggests that the violation of *Shari'ah* principles (*Shari'ah* risks) can lead to various dangers. These are credit, legal, reputational, and market risks which cause serious issues such as withdrawal of funds, higher costs of attracting deposits, direct and indirect financial losses, liquidity issues, bank runs, bank failures, and financial instability. As a result, the boards of Islamic banks are responsible for managing these *Shari'ah* risks and for having a real understanding of their influence on the stakeholders and their objectives (Ginena, 2014). This underscores the necessity of having members with *Shari'ah* knowledge on board to avoid these various types of risks. In real practice, it is rare to have members with knowledge of *Shari'ah* principles on board. Therefore, the boards of Islamic banks tend to rely on the *Shari'ah* supervisory board to support their reputation and ensure their clients' trust. Safieddine (2009) finds that 85% of surveyed banks consider *Shari'ah* supervisory board decisions to be mandatory. Thus, a larger board made up of a higher number of outside directors who have insufficient knowledge of Islamic finance might be costly, making the monitoring and advisory processes weaker due to their naivety. Adams

and Mehran (2012) argue that outsider directors with a lack of firm-specific knowledge might be associated with a cost. Also, as suggested by Beltratti and Stulz (2009), ineffective independent members increase a bank's costs and affect its performance. Therefore, a larger board made up of a higher number of outside directors who have insufficient knowledge of Islamic finance might be costly, making the monitoring and advisory processes weaker. This also might expose IBs to be non-compliant with *Shari'ah.* Consequently, the overall risks (including liquidity) for Islamic banks might increase, which might negatively impact their financial flexibility.

Secondly, the board might be motivated to increase shareholder wealth by taking on high-risk projects, which might in turn, affect other stakeholders' wealth, such as that of the investment account holders (IAHs) who are typically averse to risk. One reason why this conflict of interests has not been satisfactorily resolved is that IAHs have no representatives protecting their interests on the board. This gives managers the opportunity to exploit the IAHs' funds (Abdel Karim and Archer, 2002). In fact, IFSB (2006) recommends that Islamic banks assign a governance committee to protect IAHs' interests. However, in most cases Islamic bank clients are religiously motivated and deposit their funds in Islamic banks because of their compliance with *Shari'ah*. The existing literature (Miller and Hoffmann, 1995; Osoba, 2003; Hilary and Hui, 2009) argues that highly religious investors are risk-averse. Therefore, a large board with a higher fraction of outside directors in an Islamic bank is often associated with greater risk taking behavior (Mollah et al., 2017a). Thus, we argue that a larger board with a higher fraction of outside directors in an Islamic bank would lead to exploitation of the bank's other stakeholders' interests through aggressive risk-taking behaviour, hence reducing the effectiveness of that Islamic bank's board.

The final argument refers to the lower complexity of Islamic banks. Complex firms can be defined as being larger, more diverse (scope of operations), and/or heavily reliant on debt as an external source of financing (Klein, 1998; Coles et al., 2008). It is arguable that more complex firms need a larger board with more independent fractions in order to have more effective monitoring and adequate advice (Dalton et al., 1999; Coles et al., 2008). The previous literature (Boone et al., 2007; Coles et al., 2008; Linck et al., 2008; Lehn et al., 2009) indicates a positive relationship between board size and a firm's diversification. However, compared to Islamic banks, the previous literature claims that conventional banks are larger, more highly leveraged, and more diverse (Beck et al., 2013; Khediri et al., 2015). Moreover, Islamic banks may have more capital and maintain greater reserves of liquid assets

than conventional banks. This is due to their inability to raise non-equity capital because of their limited access to loans (Metwally, 1997; Olson and Zoubi, 2008; Bourkhis and Nabi, 2013; Karim et al., 2014). Therefore, we argue that as Islamic banks are less complex than conventional banks in regards to non-Shari'ah activates, relatively small size and few outsider members will increase a board's effectiveness.

In brief, the existing literature supports the positive influence of board effectiveness (the board's size and composition) on financial flexibility of both conventional banks and Islamic banks. However, based on the three arguments above, it can be suggested that the board's effectiveness might be determined differently across conventional banks and Islamic banks. Precisely, larger board size and a higher proportion of outsider directors may improve the board's effectiveness in conventional banks but reduce the board's effectiveness in Islamic banks. Consequently, the following hypothesis will be tested:

H2a: A larger board size with a higher proportion of outsider directors is associated with greater financial flexibility for conventional banks

H2b: A smaller board size with a lower proportion of outsider directors is associated with greater financial flexibility for Islamic banks

3.2.3 Risk committee and financial flexibility

John et al. (2016) suggest that the board's effectiveness is influenced by its committees. The bank activities together with the regulatory recommendations assure the vital role of board committees. Recently, governments and industries have started emphasising the importance of improving firms risk management (Woods, 2009; Arena et al., 2010). Most of the corporate governance codes around the world recommend the creations of dedicated risk committee to oversee the overall risk-taking management of the firm (Brown et al., 2009; Lundqvist, 2015). Consequently, recent corporate governance literature has focused on the role of the risk committee (Aebi et al., 2012; Lingel and Sheedy, 2012; Ellul and Yerramilli, 2013; Al-Hadi et al., 2016).

Aebi et al. (2012) investigate the effect of a separate risk committee existing and the presence of chief risk officer (CRO) on a bank's performance during the financial crisis. They show that the existence of dedicated risk committee affected the bank's performance negatively after controlling for other risk management components. Al-Hadi et al. (2016) examine whether risk committee effectiveness is associated with the market risk disclosure. They show

that banks with a dedicated risk committee with a larger size, and more risk committee members with better qualification are associated with greater market risk disclosure. Lingel and Sheedy (2012) find that stronger risk governance decreases the risk-taking and increases the return on assets. Ellul and Yerramilli (2013) find that independent risk management function can reduce risk-taking and enhance the banks' values. Ames et al. (2018) find that board risk committee exstiance is associated with higher financial strength rating. The overall results of risk governance studies suggest that more proper and stronger risk governance might mitigate the banks' risk-taking behaviours and increase the financial position, which as a result enhances the financial flexibility of the financial system. Consequently, we hypothesise that a stronger risk governance mechanism through creating a dedicated risk committee might improve the banks financial flexibility. Therefore, the following hypothesis will be tested:

H3*: There is a positive relationship between a stand-alone risk committee (RC) and a bank's financial flexibility.*

3.2.4 The Shari'ah supervisory board and financial flexibility

As previously discussed, besides the traditional agency conflicts, Islamic banks encounter conflicts arising from their compliance with *Shari'ah* principles and the profit-and-loss-sharing-based contracts. These conflicts cause a separation between cash flow rights and control rights for IAHs (Islamic Finance Qualification (IFQ), 2007; Safieddine, 2009). IAHs have cash flow rights but no control rights. Most Islamic banks fund providers (shareholders, depositors and investment account holders) want their funds to be invested in *Shari'ah*-compliant assets and activities. Therefore, Islamic banks should not engage in any prohibited activities that violate *Shari'ah* principles. The Accounting and Auditing Organization for Islamic Financial Institution (AAOIFI) asserts that social and religious dimensions need to be considered by Islamic banks' managements. They state that the chief objective should be to fulfil their stakeholders' interests by conducting their financial operations in compliance with *Shari'ah* principles.

The previous literature argues that individual behaviour, investor preferences, and financial decisions are significantly influenced by social norms (Kübler, 2001; Kim and Venkatachalam, 2011; Baker and Nofsinger, 2012). Al-Awadhi and Dempsey (2017) investigate the effect of religious belief on the stock market of Gulf Cooperation Council (GCC) and find that Islamic stock in these markets have higher liquidity and encounter less

liquidity risk compared to non-Islamic banks. Therefore, Islamic banks are exposed to various risks resulting from potential deviation from *Shari'ah* laws (*Shari'ah* non-compliance risk). Islamic banks' stakeholders exhibit norms and values that are closely aligned with the Islamic religion. Any action by Islamic banks that are inconsistent with *Shari'ah* principles can induce negative reactions from these stakeholders. Archer and Haron (2007) define *Shari'ah* non-compliance risk as the banks' exposure to losses because of a breach of *Shari'ah* rules and principles. They argue that there is a risk of IBs to losing their credibility because of their deviation from *Shari'ah* principles. This loss of stakeholders' trust can severely damage a bank's reputation. According to Chapra and Ahmed (2002), approximately 68% of depositors in Bahrain and 95% in Sudan would show a strong willingness to withdraw their money if an Islamic bank failed to comply with *Shari'ah* principles. Consequently, this might have a strong effect on the bank's market position, liquidity, solvency, and profitability (IFSB, 2005). This decreased funding liquidity would affect the bank's ability to attract new investors (Chapra and Ahmed, 2002).

To guarantee that Islamic banks are fully compliant with *Shari'ah*, they are obliged to construct an additional layer of governance, the so-called the *Shari'ah* supervisory board (SSB), in addition to their boards. The previous literature (Abdel Karim and Archer, 2002; IFSB, 2005) emphasises the critical role of the SSB in mitigating and controlling a bank's risk of *Shari'ah* non-compliance. Safieddine (2009) argues that since the main difference between Islamic banks and conventional banks is the true and fair compliance with *Shari'ah* laws (Grais and Pellegrini, 2006a), it is important to have a clear mechanism and procedure to guarantee the SSB's monitoring role (through supervision and disclosures) of banks' activities. Thus, stakeholder trust can be enhanced by having an effective SSB. Given the important role of an SSB in monitoring *Shari'ah* compliance, it plays a fundamental role in the decision-making processes of Islamic financial institutions (Kumar, 2009).

Evidence shows that compliance to *Shari'ah* principles is associated with higher profitability and reduced risk taking. Mollah and Zaman (2015) compare Islamic banks and conventional banks and find that a SSB's supervisory role improves the performance of Islamic banks. Abedifar et al. (2013) and Beck et al. (2013) show that Islamic banks have higher capital levels compared to conventional banks. A bank's liquidity, another source of financial flexibility, is also higher to compensate for their limited access to the loans markets (Metwally, 1997; Olson and Zoubi, 2008; Bourkhis and Nabi, 2013; Karim et al., 2014). Therefore, Islamic banks' financial flexibility position is expected to be influenced by their

Islamic governance practices. For example, *Shari'ah* principles set restrictions on the types of risky investments Islamic banks are allowed to undertake, which is turn explains the Islamic banks' higher capital positions. Also, *Shari'ah*-compliant restrictions on external financial markets have led Islamic banks to hold more liquid assets. Therefore, agency problems that arise as the result of breaching *Shari'ah* principles may contribute to the decrease in an Islamic bank's financial flexibility.

The effectiveness of SSB depends on its characteristics. The more effective the SSB, the stronger the monitoring process. Consequently, the risk of *Shari'ah* non-compliance can be reduced, which in turn strengthens banks' conservative strategies for their funding and liquidity policies (i.e., their financial flexibility). The AAOIFI states that SSB should include at least three scholar members recommended by a board. However, the senior management and board should assure the independence of the SSB members (IFSB, 2009). Increased independence can be achieved by having a larger SSB. Becker (1994) argues that having a higher number of board members can bring more knowledge, skills, and experience, which in turn strengthens the monitoring process. As a result, an Islamic bank's compliance with *Shari'ah* laws can be ensured, thus leading to improved financial flexibility.
In practice, there is a shortage of experts in Islamic law (Morrison, 2014), resulting in most SSB members tending to hold multi-directorships. It could be claimed that this affects their performance in monitoring managerial behaviour. However, it could also be argued that as the SSB members have high multi-directorships, it may improve the quality of their monitoring because of their accumulated knowledge and experience. Fama (1980) and Fama and Jensen (1983) argue that members with good reputations tend to have more directorships because of their strong knowledge and experience in monitoring and advisory roles. As a result of this effectiveness, they can increase their current clients' trust as well as attract new religiously motivated investors to invest their money in Islamic banks.

Furthermore, Grais and Pellegrini (2006a) suggest that it would be more effective to have a SSB with knowledge of both Islamic law and finance. Therefore, the members' qualifications would play a crucial role when monitoring Islamic banks activities in respect of prohibited financial instruments. Members with financial knowledge may discourage their management from manipulating the facts when explaining their bank's financial transactions and contracts to the SSB, thus leading to increased client trust with regard to the Islamic bank's compliance with *Shari'ah* law. Thus, we expect that members' qualifications may affect the SSB's monitoring ability, which in turn affects that Islamic bank's financial flexibility.

Only a few studies have examined the effect of the SSB on Islamic banks' operations performances. Alman (2012) examines the characteristics of SSB on banks' risk-taking behaviours in the Middle East, North Africa, and Southeast Asia. He finds that SSB's size, scholarly ranking, and annual changes positively impact credit risk. Mollah and Zaman (2015) compare Islamic banks and conventional banks and find that a SSB's supervisory role improves an Islamic bank's performance. Grassa (2016) investigates the SSB's effect on Islamic bank's credit rating. The results of her study confirm the SSB' effectiveness at enhancing Islamic banks' performances, such that a higher percentage of SSB multiple memberships increases an Islamic bank's credit rating. Safiullah and Shamsuddin (2018) find that an increase in SSB size and SSB academic qualification are associated with lower operational and insolvency risks. However, these risks are positively related to the number of reputed member on the SSB. Although these few studies have addressed SSB's effects on an Islamic bank's performance and risk-taking, their effectiveness at ensuring an Islamic bank's conservative strategies for their financial flexibility (their funding and liquidity policies) has not yet been investigated.

Drawing on the extant literature, we can see that an effective SSB enforces specific disciplines for an Islamic bank's management. The SSB provides a good mechanism for ensuring management compliance with *Shari'ah,* which in turn assists the maintenance of conservative financial policies. This improved compliance may increase stakeholder trust and lead to lower insolvency risk. Eventually, Islamic banks' financial flexibilities may improve. Consequently, the following hypothesis will be tested:

H4*: There is a positive relationship between SSBs' effectiveness and Islamic banks' financial flexibilities.*

3.3 Research design and data

3.3.1 Sample

Our initial sample includes 360 banks; 94 Islamic banks (IBs) and 266 conventional banks (CBs) operating in 22 MENA countries between 2009 and 2015.[13] The investigation is conducted during this period for several reasons. First, the selection of the sample period

[13] Although IBs have expanded beyond Islamic countries (Safieddine, 2009), the majority are based in the Middle East & North Africa (MENA) region, where Islam is a dominant religion (Ernst and Young, 2012; Abdelsalam et al., 2016). Also, the growth of IBs in that region is high compared to other regions. The IBs in this region hold many of the assets among the IBs world-wide which equal more than 1.3 trillion (Ernst & Young, 2012).

allows the study to avoid potential effects of the exogenous macroeconomic shock that banks experienced during the financial crisis of 2007-2008. This may distort the effects of corporate governance obtained. Second, corporate governance mechanisms (e.g., board of directors and its committees) have received significant reforms after the recent financial crisis. Furthermore, IBs experience a peaked flourish, which dramatically increased the global awareness towards IBs during this period. We require a bank to have full annual reports, published as the financial year ending on the 31st of December. Following prior literature (Abedifar et al., 2013; Beck et al., 2013; Abdelsalam et al., 2016; Mollah et al., 2017a), we filtered the sample further based on the following three criteria: (1) a country is required to have both types of banks; (2) only full-fledged commercial banks are used. Therefore, full investment banks and CBs with Islamic windows were dropped from the sample[14]; (3) and non-commercial, unlisted banks and banks with less than two consecutive years of data were eliminated. The final sample consists of 65 listed banks (440 bank-year observations). Table 3.1 presents the sample distribution by country and bank, with 28 IBs (188 observations) and 37 CBs (252 observations). The highest proportions of IBs are in Bahrain and Kuwait, while Jordan reports the highest concentration of CBs.

[14] CBs with Islamic windows refer to banks that provide products that are compliant with *Shari'ah* (Beck et al., 2013). We exclude CBs with Islamic windows, as they do not provide separate financial data that allow us to distinguish between these windows and full CBs (e.g., Cihak & Hesse, 2010).

Country	Observations (IBs)	Observations (CBs)	Observations (Full Sample)	IBs Percentage	CBs Percentage	Full Sample Percentage
Bahrain	35	14	49	18.62%	5.56%	11.14%
Egypt	14	21	35	7.45%	8.33%	7.95%
Jordan	14	70	84	7.45%	27.78%	19.09%
Kuwait	35	28	63	18.62%	11.11%	14.32%
Lebanon	0	28	28	0.00%	11.11%	6.36%
Oman	6	21	27	3.19%	8.33%	6.14%
Palestine	14	7	21	7.45%	2.78%	4.77%
Qatar	21	35	56	11.17%	13.89%	12.73%
Saudi Arabia	28	0	28	14.89%	0.00%	6.36%
Tunisia	0	14	14	0.00%	5.56%	3.18%
UAE	21	14	35	11.17%	5.56%	7.95%
TOTAL	**188**	**252**	**440**	**43.00%**	**57.00%**	**100.00%**
Number of Banks	28	37	65			

Notes: The final sample employs an unbalanced panel data of 65 listed banks (440 bank year-observations), operating in 11 MENA countries.

Table 3.1 Sample distributions

The consolidated financial data (in US dollars) were obtained from the *BankScope* and Bloomberg databases. The governance-level data were manually collected from the banks' annual reports that were available on their official websites. The country-level variables (macroeconomic and governance indicators) were retrieved from the World Bank website.

3.3.2 Measures

3.3.2.1 Financial flexibility

Financial flexibility (FF) is not directly observable; rather, it refers to a firm's desire to be financially flexible (Graham and Harvey, 2001). The previous literature concludes that FF should be achieved by using different aspects of a firm's financial policies, i.e., capital structure, liquidity, and investment strategy decisions e.g. (Gamba and Triantis, 2008; Daniel et al., 2010; Marchica and Mura, 2010; Mittoo et al., 2011; Meier et al., 2013; Arslan-Ayaydin et al., 2014; Rapp et al., 2014; Ferrando et al., 2017). The measure of FF by capturing one single aspect may be misleading. Gamba and Triantis (2008) argue that using one-dimensional measure for financial flexibility might be misleading as life-cycle may affect this dimension. In more detailed, firm's financial policies (i.e., funding structure and liquidity) might be affected by its life-cycle. For example, constrained firms hold more cash because of the restrictions they face in accessing external funding, whereas mature companies consider cash holding to be a costly strategy, as they can obtain external financing at a lower cost because of their reputation and the size of their assets. The previous literature e.g. (Billett and Garfinkel, 2004) notes the negative relationship between cash holding reserves and a bank's ability to access external funds. Therefore, it might be misleading to judge a firm's FF based on only one proxy such as its liquidity policy.

Although banking literature has not yet investigated the FF of banks, similar attributes have been examined in other banking studies. They compare both types of banks' financial strengths focusing on individual aspects such as capital adequacy (Beck et al., 2013), bank insolvency (Bourkhis and Nabi, 2013; Mollah et al., 2017a), deposits (Karim et al., 2014), or profitability (Beck et al., 2013). The results of these studies are usually conflicting. Beck et al. (2013) find that IBs have a higher intermediation ratio, higher asset quality, and are better capitalised, but they are less cost-effective. A possible limitation of this analysis is that it only provides a partial view, as it judges banks' overall financial strengths based on just one dimension. This being the case, constructing an index that addresses these possible limitations is of considerable valuable when measuring banks' FFs.

We construct a financial flexibility index (FFI) using three proxies to capture a bank's FF: core funding ratio, liquid assets ratio, and insolvency risk. The selection of these proxies is based on their intensive use by international regulators (e.g., core funding and liquid assets ratios) and their connotations to CAMEL framework categories.[15] We include the core funding ratio when measuring banks' FFs for many reasons. Unlike non-financial firms, banks can raise funds from two segmented markets (the insured and uninsured markets).[16] However, relying on the short-term wholesale market is risky, as it is not insured. Thus, creditors might be highly sensitive to market liquidity risks, which increase banks' risk of funding withdrawals. In contrast, core funding is less vulnerable to a market liquidity shock.[17]

The core funding ratio refers to the amount of available stable funding (BCBS, 2014). The previous banking literature documents the importance of stable funding on banks' abilities to deal with unexpected losses and to take advantage of investment opportunities (Athanasoglou et al., 2008; Ivashina and Scharfstein, 2010; Farag et al., 2013; Oura et al., 2013; Jung and Kim, 2015). A bank's funding structure is effective for providing liquidity; thus, banks with more core funding are more stable (BCBS, 2014; Jung and Kim, 2015). Therefore, we consider the stability of a bank's funding structure as a proxy for FF. Generally, the higher the stable (core) funding ratio, the greater the bank's FF. Consistent with the previous literature (Demirgüç-Kunt and Huizinga, 2010; BCBS, 2014; Bologna, 2015; Jung and Kim, 2015; Ashraf et al., 2016), we consider core funding sources to be core deposits, core capital (Tier1), and debt and bank bonds with more than one-year maturities.[18] We consider 95% of total customer deposits to be core deposits, as suggested by (BCBS, 2014). In addition, IBs have a different funding structure, whereby they rely on profit-sharing investment accounts (PSIAs) in addition to demand deposits. The previous literature e.g. (Cihak and Hesse, 2010; Abedifar et al., 2013) argues that PSIAs provide more flexibility for IBs since the risk is born on the investors' interest. Thus, PSIAs also offer more stability for IBs, which increases their FFs. Consistent with the BCBS (2014); IFSB (2015) and Jung and Kim (2015), we estimate

[15] CAMEL framework is used to assess the bank's financial position in terms of capital adequacy (i.e., capital risk), assets quality (i.e., credit risk), management (i.e., expense management), earnings (i.e., profitability), and liquidity (i.e., liquidity risk) (Golin and Delhaise, 2013).
[16] Billett and Garfinkel (2004) argue that banks have more FF, as they have access to two different markets. The insured market is where a bank can raise funds from depositors. Whereas, an uninsured market is where banks can raise funds from investors.
[17] Basel Committee on Banking Supervision (BCBS) suggests retail (demand and term) deposits, capital and debt with one-year maturity or more to be treated as core funding.
[18] See p.5 of the BCBS document "Basel III: The Net Stable Funding Ratio (2014)". Available on (www.bis.org). Aebi et al. 2012 and Myers, 1977 also assure that banks with more capital would suffer less from debt overhang problems and have more flexibility to respond to financial distress. Some of the previous literature only considers explicitly insured deposits to be core deposits; however, some of the countries in our sample have no insurance deposit system and have just implicit insurance on deposits from their central banks.

the core stable funding ratio (SFR) using total customer deposits (demand and term) *95% plus Tier 1 capital plus debt with long-term maturity scaled by total assets.[19]

For the second proxy (liquid assets ratio), previous research (Opler et al., 1999; Bates et al., 2009) concludes that firms are motivated to hold more cash due to certain changes (e.g., cash flow volatility, R&D spending, and market-to-book ratio). The liquid assets ratio refers to the financial slack that built by holding cash and cash equivalents to encounter the unexpected earning shocks and investment opportunities (Denis, 2011). Hugonnier and Morellec (2017) argue that liquid reserves and equity capital can work as buffer against default risk. Cihak and Hesse (2010) use the liquid assets ratio to measure banks' liquidities. Billett and Garfinkel (2004) suggest that liquid assets could be used as a buffer against times of crisis. The higher this ratio, the greater a bank's FF. Consistent with Arslan-Ayaydin et al. (2014) and Billett and Garfinkel (2004) , we calculate the liquid assets ratio (LA) using the cash and cash equivalent scaled by total assets.

Insolvency risk refers to the banks' probability of being insolvent (Lepetit and Strobel, 2013). In considering the insolvency risk (Z-score), the previous non-financial literature (e.g., Daniel et al., 2010; Mittoo et al., 2011) uses the Altman Z-score to measure FF. However, as the Altman Z-score does not apply to banks, we employ another Z-score measure which the banking literature uses to measure insolvency risk. Hugonnier and Morellec (2017) find that increase in tail risk, leverage level, and cost of external finance, and decrease in liquid reserve led to the increase in insolvency risk. The Z-score can calculate both interest and fee-based income and it has been commonly used to measure banks' financial stabilities (Cihak and Hesse, 2010; Aebi et al., 2012; Beck et al., 2013; Mollah et al., 2017a). The Z-score is inversely related to the probability of banks' insolvencies. Banks become insolvent if their assets value drops below their debt value. A higher Z-score implies a lower insolvency risk for banks. Consistent with previous literature (Cihak and Hesse, 2010; Aebi et al., 2012; Beck et al., 2013; Mollah et al., 2017a), we calculate the Z-score as the expected return on assets $\mathrm{E(ROA)}_{it}$ plus the equity capital to total assets ratio $(\mathrm{CAR})_{it}$ divided by the standard deviation of return on assets $\sigma(\mathrm{ROA})_{it}$.[20]

[19] Both BCBS (2014) and IFSB (2015) give an ASF (available stable factor) of 100% for regulatory capital and liability with more than one-year maturity. Also, they give a 95% ASF for consumer deposits and unrestricted IAH.
[20] Z-score is captured using the natural logarithm to control for any outliers and high skewness of the distribution. The standard deviation of ROA is measured using three consecutive years (current + two previous year).

To construct our FFI, we use mechanisms established in the previous literature (Mittoo et al., 2011; Meier et al., 2013; Arslan-Ayaydin et al., 2014; Ferrando et al., 2017) to evaluate a firm's FF position. We take the country *j* average of each proxy at each time *t* and compare it with the bank *i* value of each proxy to capture the FF level. We take the country and time average to mitigate any bias that might affect this study. We then create dummy variables for each of the three FF proxies (see Appendix 1). Each dummy variable has a value of 1 if a bank's proxy has a score above the country average, otherwise its score is 0. Finally, we give a scale value for the FFI from 0 to 3, where a high value means the bank is maintaining a healthier FF. We use the scale value derived from the three proxies to get the overall FF level.[21] This mechanism for capturing the FF position can provide a full picture of a bank's financial health, as it considers various aspects: funding structure, liquidity policies and insolvency risk.

Table 3.2 introduce insight into the relationship between the FFI and the proxies that used to build this index. This table provides the averages of the ratios for each different categories of the FFI, together with the Pearson's correlation coefficient between the used proxies and the FFI. The results declare that LA is the proxy most strongly related to the FFI, followed by z-score and SFA respectively. Furthermore, the results show that the FFI range is increasing with the increase of all the FF proxies. This assures the validity of the FFI that is used in this paper.

FFI range	LA	SFA	Z-score
0	0.14	0.71	3.21
1	0.19	0.80	3.58
2	0.24	0.83	4.04
3	0.27	0.85	5.41
Correlation	0.46	0.40	0.44

This table shows the mean value of our FFI index component with each category of the FFI range. LA is the liquidity ratio. SFR is the stable funding ratio. Z-score is the financial stability measure. All the definition of these variables have been discussed in section 3.3.2.1

Table 3.2 Relationship of financial ratios to FFI (Mean and Correlation)

3.3.2.2 Corporate governance variables

We use several characteristics related to the board of directors (BOD), board risk committee (RC), and *Shari'ah* supervisory board (SSB) monitoring mechanisms as our primary

[21] We require the availability of all our FFI's proxies to have a value. We, therefore, remove any missing values in the FFI components.

explanatory variables to measure a bank's governance effectiveness.[22] The BOD structure effects are measured using two indicators: (1) BOD size (*BODSIZE*), measured as the total number of a board of directors's members (Coles et al., 2008; Adams and Mehran, 2012); (2) BOD independence (*BODIND*), measured as the percentage of independent non-executive directors on the BOD (Aebi et al., 2012; Mollah and Zaman, 2015). The risk committee effect is measured using a dummy variable capturing the existence of a separate RC (*RCE*). It takes the value of 1if the bank has a dedicated risk committee in year t and 0 otherwise. The SSB effectiveness is captured using three variables: (1) SSB size (*SSBSIZE*), measured by the total numbers of *Shari'ah* advisors on the board; (2) SSB qualification (*SSBQUAL*), measured by the percentage of *Shari'ah* advisors with financial qualifications on the SSB; (3) SSB multi-memberships (*SSBMULTI*), measured by the percentage of *Shari'ah* advisors on the board holding multi-directorships, calculated as the number of *Shari'ah* advisors serving on two or more additional (outside) firms divided by the number of *Shari'ah* advisors on the board. We also use a factor analysis approach to measure the SSB's effectiveness (*SSB-Effectiveness***)** instead of using the three SSB characteristics individually. This step allows us to capture the effectiveness of the SSB's characteristics as a whole.

3.3.2.3 Controls

We control for the relevant banks-specific variables that may drive the empirical analysis. *CEO-Duality* has been considered to control for the board independence and the management actions. The separation between the role of CEO and the chairman of the board may improve the management actions as this avoids the problems associated with the possibility of the CEO benefitting his own interests by taking higher risk, and thus reducing the banks FF. We also included insider ownership (*MANOWN*), measured by the percentage of shares held by executive directors out of the total number of shares to control for equity agency costs (Marchica and Mura, 2010). Leaving out the ownership structure would provide a deficient analysis of bank risk-taking (Laeven and Levine, 2009). Chen and Hsiao (2014) find that insider ownership aids in determining the FF of firms. Bank age (*AGE*), measured by the difference between the sample year and the year when the bank was established, may affect a bank's ability to maintain or issue funds, thus affecting its FF. Unconstrained banks are usually mature, which allows them to hold less cash and depend more on their ability to borrow from external markets. Bank size (*LOGTA*), measured as the natural logarithm of the total assets of a bank, is also included. Small banks are usually financially constrained, which motivates them to maintain more cash. Faulkender and Wang (2006) and Pinkowitz et al.

[22] See Appendix 2 for variables definitions

(2006) find that cash holding is more valuable for firms that have higher estimated external financing costs (financially constrained firms). Furthermore, bank size plays a crucial role when structuring risk strategies. For example, large banks might be riskier because of the exploitation of Too-Big-To-Fail safety net subsidies. Both age and size can also control for a bank's level of complexity, as they can affect the characteristics of the bank's BOD (Boone et al., 2007; Coles et al., 2008; Linck et al., 2008).[23] The profitability (*ROAA*) also plays a crucial role in affecting the funding and cash holding policies and, therefore, it should be controlled for. We also control for banks' growth opportunities (*GROWTHOPP*), measured by Tobin's Q, and banks' return volatilities (*RISK*), measured by the standard deviation of the return on average assets, as both variables give incentives for banks to maintain a financially flexible position (DeAngelo and DeAngelo, 2007; Gamba and Triantis, 2008). However, this volatility might be an indication of a bank's level of risk, where higher return volatility refers to the high risk that a bank is taking, thus negatively affecting the bank's FF. Bank Tier 1 Capital Ratio (*TIER1*), measured by the core capital divided by weighted risk assets, is included, as it has a real effect on a bank's funding structure. Myers (1977) argues that regulators consider the Tier 1 ratio to be an essential indicator of a bank's financial strength. Cost efficiency plays a crucial role in a bank's ability to maintain an FF position, as higher inefficiency costs indicate a weak bank managing system, which increases the incentive to take greater risks (Kwan and Eisenbeis, 1997). This leads to a decrease in a firm's ability to hold onto cash and to access external funding sources. Thus, we controlled for cost efficiency (*COSTEFF*) measured by the cost to net income ratio. The *ISLAMIC* dummy variable was also included, 1 if the bank is Islamic, 0 otherwise.

We also use country-specific variables to control for differences in economic development and growth (Abedifar et al., 2013; Mollah et al., 2017). These include: (a) GDP per capita (*LOGGDPPC*), (b) the annual GDP growth rate (*GDPGROWTH*), (c) government effectiveness (*GOVERNMENT-E*), (d) the annual rate of inflation (*INFL*), (e) the Herfindahl-Hirschman Index (*HHI*) concentration ratio, (f) the domestic interest rate (DIR), and (g) the legal system (*LEGAL*). We further include an indicator for country governance quality (G-Index), as it might affect a bank's governance system and FF. The country governance index was produced by (Kaufmann et al., 2009). It also can calculate cross-country differences which might affect a bank's risk-taking (Cihak and Hesse, 2010). The G-index includes an

[23] Firm leverage is also considered to be a complexity level determinant. However, we did not include it in our tests due to a multicollinearity problem with Tier 1. We included the leverage ratio in our complexity analysis.

average of the six governance indicators: voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law, and corruption control.

3.3.3 Estimation methods

To control for unobservable and constant heterogeneity (i.e., business strategies and banks' specific features), this study applies panel data analysis (Andres and Vallelado, 2008). The most popular estimation methods for panel data are the Ordinary Least Squares (OLS), fixed effect, and random effect. OLS method is popular analysis in investigating the association in a regression model. However, one of the main assumptions of OLS model is that the error terms should not be correlated across time period (Podestà 2002). However, this correlation is not considered as a problem in the panel data model. In the fixed effect estimation, the heterogeneity between firms that results from various managerial styles or managerial strategies can provide different intercepts for each individual firm (Gujaratı 2004). Fixed effect can address outcome bias problems that arise from characteristics differences within observations by removing the influences of time-invariant characteristics from the predicator (Wooldridge, 2002). On the other hand, random effect provides variance factors for groups/times and errors, expecting the same intercepts and slopes. The main difference between these groups/times is placed in their variances of the error terms instead of in their intercepts. However, to decide on which estimation method should be used, the Hausman specification test should be run as a robustness check. The Hausman test conducts a comparison analysis between fixed and random effects to investigate whether the entity or individual effects are not correlated with the explanatory variables in the model (Hausman 1978). If the results of this test show that there is a correlation, then null hypothesis should be rejected, and the fixed effect model should be used, otherwise random effect should be adopted.

In this study, fixed effect is not an appropriate estimation method for several reasons. First, this study investigates corporate governance variables, which relatively do not vary over time (Hermalin and Weisbach 1998). Fixed effect requires continuous variations within the panel data to generate accurate results (Pathan, 2009). This study mainly has the variation arise from the cross section, not from the time series. Second, the degree of freedom is subject to large losing (Baltagi 2001). Furthermore, to determine the appropriate panel estimation method, the study followed Ntim (2015)'s study by accomplishing Breusch and Pagan LM test to decide on whether to use pooled OLS or random-effect estimation method. The result of this test suggests that the null hypothesis, which tests the existence of zero variance across individual, cannot be rejected. Therefore, OLS estimation method is an appropriate technique

to be employed. Moreover, due to the nature of the dependent variable in this study, there are some specific estimation methods being used to control for this nature.

The study uses several sets of instruments and employed a variety of statistical tests to assess the impact of governance structures on FF. First, this study performs pooled Ordinary Least Squares (OLS) with robust standard errors to control for any potential heteroskedasticity problems. In addition to using OLS, the study conducts a Tobit-formulation for our second regression to account for the censored nature of the dependent variable (FFI) and to provide a powerful specification check. Furthermore, as the dependent variable is converted to ordinal data and has limited values between 0-3, this study also applies an ordered logistic regression for all FFI models.[24] Also, for robustness check purposes, we re-estimate our model using the lagged approach for independent and banks-specific control variables to control for endogeneity (reverse causality). To further control for endogeneity problems, we re-estimate our model using the dynamic panel estimation, Generalized Methods of Moments (GMM). This technique addresses all the kinds of endogeneity problems (i.e., reverse causality, measurement error in the repressor, and omitted-variables bias). Also, we use the probit model for another FF binary measure. We test our three hypotheses by running the following empirical model:

$$FFI_{i,j,t} = a_0 + a_1 * CG_{i,j,t} + b_1 RCE_{i,j,t} + b_2 SSB_{i,j,t} + \gamma * X_{i,j,t} + \delta * ME_{j,t} + \varepsilon_{i,j,t} \quad (1)$$

where,

$FFI_{i,j,t}$ is the Financial Flexibility Index of bank *i* in country *j* at time *t*,

$CG_{i,j,t}$ is a matrix of the Corporate Governance of bank *i* in country *j* at time *t*,

$RCE_{i,j,t}$ is a proxy of the dedicated Risk Committee existing of bank *i* in country *j* at time *t*,

$SSB_{i,j,t}$ is a matrix of the *Shari'ah* supervisory board of bank *i* in country *j* at time *t* (only IBs),

$X_{i,j,t}$ is a matrix of bank-level control variables of bank *i* in country *j* at time *t*,

$ME_{j,t}$ is a matrix of country-level macroeconomic variables,

$\varepsilon_{i,j,t}$ is the error term; α_0 is the constant; and α, β, γ, and δ are the vectors of coefficient estimates.

We use the above model to analyse the effects of (i) the board of directors' structure (BODSIZE and BODIND), (ii) risk committee (RCE), and (iii) the *Shari'ah* supervisory

[24] See appendix 3 for this results.

board (SSBSIZE, SSBQUAL, and SSBNULTI) variables on banks' FFs using our financial flexibility index (FFI).

3.4 Results and analysis

3.4.1 Descriptive statistics

The descriptive statistics are shown in Tables 3.3.a and 3.3.b. In Table 3.3.a, the mean and distributional characteristics of all variables are reported for the full sample as well as each subsample of the banks clustered according to the bank type. The FFI mean values for IBs, CBs, and the full sample are 1.34, 1.43, and 1.39, respectively. Unconditionally, there is no significant difference in financial flexibility between conventional and Islamic banks. Figure 3.1 shows the mean value of FF for each bank type estimated by FF1. The figure shows the differences in mean value across years for each sample (CBs and IBs samples). The figure reveals that CBs are more financially flexible than IBs in the following years: 2009, 2010, 2011, 2012, and 2015. Nevertheless, IBs are more financially flexible than CBs in the following years 2013 and 2014. Consistent with the statistical results, the differences in financial flexibility positions between CBs and IBs are slightly different. For example, the different mean value of FF between IBs and CBs in 2014 is only 0.2. The higher FF that CBs have in general might be because of their lower insolvency risk, but not from their capital protection level. The previous literature (Cihak and Hesse, 2010; Beck et al., 2013) finds that IBs are more capitalized compared to CBs. The results of the TIER1 and RISK variables in Table 3.3.a confirm this argument, as the *t*-test shows significant differences ($p < 0.01$) in the mean values of both variables between IBs and CBs. TIER1 shows the mean values of 20.8 and 15.7 for IBs and CBs, respectively. CBs also have a lower RISK mean value (0.34) compared to IBs (0.98). These results are consistent with those of Mollah et al. (2017). IBs profitability is significantly lower than CBs, as the mean value of IBs (ROAA) is 0.856 compared to 1.466 of CBs, and the mean value for the full sample is 1.211. Cost efficiency also gives an internal interpretation of the differences between IBs and CBs, where there is a significant difference between IBs (55.3) and CBs (42.2), indicating that IBs are less efficient at managing their costs, which better supports CBs' FFs. This is also consistent with previous studies (Beck et al., 2013), who conclude that CBs are more cost-efficient than IBs.

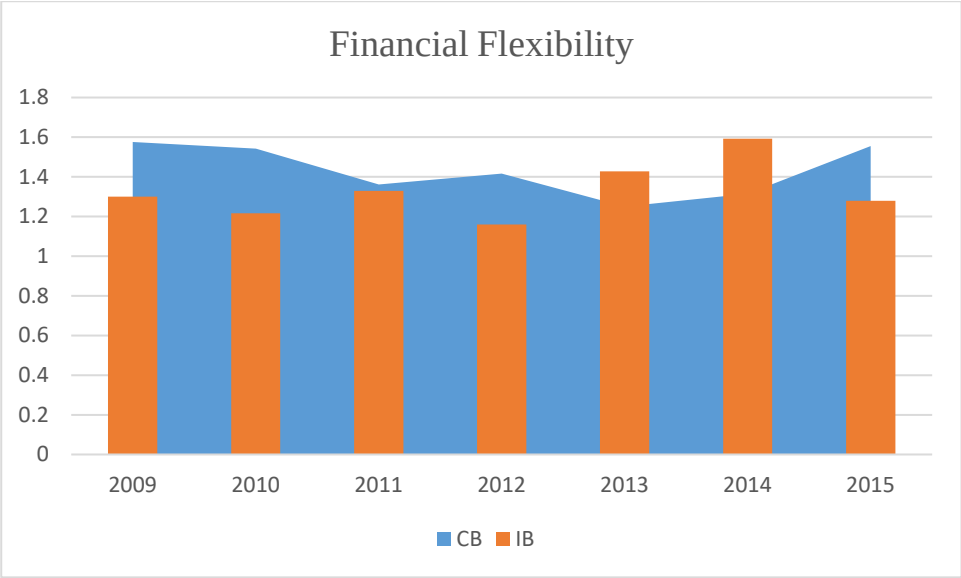

Figure 3.1 Distribution of Financial Flexibility across years between IBs and CBs (FFI mean)

The descriptives reveal that the CEO-Duality role rarely occurs in IBs compared to the CBs, as the *t*-test shows significant differences ($p < 0.01$) in the mean values between IBs and CBs. Furthermore, the mean values of MANOWN are 4.6 %, 3.5%, and 4.0% for IBs, CBs and the full sample respectively. The mean values of SSBSIZE, SSBQUL, and SSBMULTI are 4, 0.25, and 0.75, respectively. Interestingly, SSBMULTI indicates that most *Shari'ah* advisors have multi-seat positions. The mean values for BODSIZE are 9.48 and 10.1 for IBs and CBs, respectively, and 9.82 for the full sample. The average proportion of independent members (BODIND) for IBs (CBs sample: full sample) is 45% (40%:42%), indicating that IBs have a higher percentage of independent directors than CBs, whereas CBs have more directors on their boards than IBs. The two-sample *t*-test analysis shows a significant difference between IBs and CBs for BODSIZE ($p < 0.01$) and BODIND ($p < 0.10$). The descriptive for the RCE shows that there are no significant differences between the IBs and CBs mean values, where the IBs have a mean value of 0.762 compared to 0.820 for CBs.

Variables	Obs	Full Sample Mean	Median	SD	Min.	Max.	IBs: Sample Mean	CBs: Sample Mean	Two-Sample *t*-test
Panel A: dependent variables									
FFI	419	1.391	1.00	0.850	0.00	3.00	1.337	1.429	1.089
FFI2	374	4.074	4.00	1.692	0.00	8.00	4.667	4.079	0.067
FF-LA	429	0.494	0.00	0.501	0.00	1.00	0.513	0.479	-0.693
Panel B: corporate governance									
BODSIZE	421	9.815	10.00	1.911	5.00	16.00	9.483	10.06	3.077***
BODIND	440	0.445	0.428	0.248	0.00	1.00	0.483	0.417	-2.755***
RCE	394	0.796	1.00	0.402	0.00	1.00	0.762	0.820	1.405
SSBSIZE	174	4.034	4.00	1.058	1.00	6.00	4.034	-	-
SSBQUAL	174	0.247	0.20	0.225	0.00	0.80	0.247	-	-
SSBMULTI	174	0.746	0.75	0.267	0.00	1.00	0.746	-	-
SSB-Effectiveness	174	-0.013	-0.218	0.723	-0.971	1.571	-0.013	-	-
Panel C: bank and country level characteristics									
CEO-Duality	387	0.147	0.00	0.354	0.00	1.00	0.023	0.242	6.287***
MANOWN	421	0.040	0.00	0.088	0.00	0.399	0.046	0.035	-1.253
AGE	419	33.76	36.00	16.87	1.00	85.00	24.22	40.81	11.37***
LOGTA	438	15.64	15.75	1.239	12.18	18.81	15.45	15.78	2.790***
GROWTHOPP	400	1.051	1.029	0.113	0.400	1.656	1.056	1.048	-0.748
ROAA	426	1.211	1.304	1.120	-2.757	3.218	0.856	1.466	5.735***
RISK	430	0.608	0.291	0.885	0.022	4.469	0.982	0.339	-7.957***
TIER1	412	17.91	15.30	7.975	9.660	46.78	20.78	15.73	-6.692***
COSTEFF	423	47.61	44.66	19.50	20.27	112.1	55.33	42.18	-7.20***
ISLAMIC	440	0.427	0.000	0.495	0.000	1.000	-	-	-
LOGGDPPC	440	9.614	9.923	1.161	7.582	11.48	-	-	-
GDPGROWTH	440	4.026	3.096	4.422	-7.076	20.94	-	-	-
GOVERMENT-E	440	0.207	0.116	0.558	-0.880	1.536	-	-	-
G-Index	440	-0.037	-0.077	0.451	-0.921	0.790	-	-	-
INFL	421	3.088	2.909	2.994	-4.863	11.76	-	-	-
HHI	440	0.204	0.200	0.087	0.086	0.511	-	-	-
DIR	436	2.952	2.249	1.914	0.290	7.683	-	-	-
LEGAL	439	1.000	1.000	0.358	0.000	2.000	-	-	-

Notes: The table presents descriptive statistics of all variables used in the regression models for the full sample and each bank type. FFI is our financial flexibility index: An ordinary variable [0,3], indicating different levels of financial flexibility (see Appendix 1). FFI2 and FF-LA are other proxies for banks financial flexibility FFI2 is an ordinary variable [0,8], indicating different levels of financial flexibility (see Appendix 1). FF-LA takes value of 1 if their measure is higher than the mean value of the full sample for the same year, otherwise 0. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. RCE is dummy variable take value of 1 if the bank has dedicated risk committee and 0 otherwise. SSBSIZE is the total numbers of Shari'ah advisors on the board. SSBQUAL is % Shari'ah advisors with financial qualifications in the SSB. SSBMULTI is % Shari'ah advisors in SSB serving two or more additional (outside) firms. SSB-Effectiveness is factor analysis eigenvalue obtained from three SSB characteristics mentioned before. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. AGE is the difference between the sample year and the year in which the bank was established. LOGTA is the bank's size measured by natural logarithm of total assets. GROWTHOPP is banks growth opportunities measured by Tobins' Q (Equity MV plus liability BV divided by asset BV). ROAA is return on average assets. RISK is the bank return volatility measured by the SD of return on average assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise. LOGGDPPC is the country GDP per capita measured by Natural logarithm of GDP per capita. GDPGROWTH is the GDP growth rate. GOVERNMENT-E is the government effectiveness. G-Index is country corporate governance quality measured by six indicators. INFL is the annual rate of inflation. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. DIR is the deposit Interest Rate. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. We also report on the paired sample mean test (*t*-test). $*p < 0.1$; $**p < 0.05$; $***p < 0.01$ (two-tailed test).

Table 3.3. Descriptive statistics for regression variables

Table 3.3.b shows the different levels of complexity between the two types of bank. For a robust analysis of the level of complexity, we use Factor Analysis to create a factor score based on the most commonly used variables (LEV, AGE, and LOGTA), indicating the level of complexity.[25] Previous studies use and prove the complexity variables (Coles et al., 2008; Linck et al., 2008). Following Coles et al. (2008), we create a dummy variable (ADVICE**)** that has a value of 1 (COMPLEX) if the complexity score value for each bank year is higher than the median value of the full sample, and 0 (SIMPLE) otherwise. The different BODSIZE for each type of bank might be explained by the significant difference (*t*-test, $p < 0.01$) for ADVICE, AGE, LOGTA, and LEV. The ADVICE needed result for CBs is 61%, compared to 34% for IBs, confirming that CBs are more complex than IBs, so they need a larger BODSIZE to provide more experience, advice, and access to external sources. We also categorise the sample into COMPLEX and SIMPLE banks based on the ADVICE needed variable. Consistent with Coles et al. (2008) and Linck et al. (2008), we find that COMPLEX banks have a significantly larger BODSIZE at the 1% level (10.09) than SIMPLE banks (9.572). This additional test confirms our argument that IBs are considered to be simple organisations that only need a small BODSIZE to be effective.

[25] We give each bank year observation a factor score based on the variables discussed above. The factor scoring mechanism is a liner combination of the transformed value of the complexity variables.

Variables	Full Sample								
	Obs	Mean	Median	SD	Min.	Max.	IBs: Sample Mean	CBs: Sample Mean	Two-Sample *t*-test
ADVICE	419	0.496	0.00	0.500	0.00	1.00	0.337	0.614	5.815***
LEV	437	0.857	0.874	0.088	0.068	0.572	0.834	0.873	6.193***
AGE	419	33.76	36.00	16.87	1.00	85.00	24.22	40.81	11.37***
LOGTA	438	15.64	15.75	1.239	12.18	18.81	15.45	15.78	2.790***
	COMPLEXITY LEVEL						***SIMPLE***	***COMPLEX***	
BODSIZE							9.572	10.09	-2.784***

Notes: The table presents descriptive statistics of all variables indicating the banks group complexity level. ADVICE is a proxy for the banks advices needs measured by dummy variable take value of 1 if factor analysis loading score using the three complexity proxies (leverage, age, and banks size) is higher than the sample median for each bank-year. LEV is the banks financial leverage measured by total debts/total assets. AGE is the difference between the sample year and the year in which the bank was established. LOGTA is the bank's size measured by natural logarithm of total assets. BODSIZE is the total number of BOD members. We also report on the paired sample mean test (*t*-test). *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$ (two-tailed test).

Table 3.3.b. Descriptive statistics for banks complexity level

Table 3.4 also provide more understanding of the banks characteristics, where it provides a comparison between the characteristics of high financially flexibly banks and banks with low financially flexible position based on our main financial flexibility index (FFI) index. The results show that the other financial flexibility measures (FFI2 and FF-LA) are consistent with the main index as FFI2 and FF-LA are significantly higher with high financially flexible banks. The mean value of BODSIZE for high FF banks is 10.05 compare to 9.577 for low FF banks. This difference is significant which reveals that banks with higher financial flexibility position have larger board size compare to those with low position of FF. Significantly, the age between both high FF and low FF is different, as it shows higher age for high FF position. This can confirm the business cycle effect that banks in mature stage can be more financially flexible compare to growth stage. The results are consistent with our assumptions that bank with high financial flexibility position would have high investment opportunities, take lower risk, and have higher equity capital buffer.

	Full Sample		
Variable	**High FF**	**Low FF**	**Two sample t-test**
FFI2	4.922	3.399	-9.65***
FF-LA	0.727	0.294	-9.58***
BODSIZE	10.050	9.577	-2.75***
BODIND	0.420	0.469	1.45
RCE	0.820	0.776	-0.74
SSBSIZE	4.118	3.955	-0.91
SSBQUAL	0.252	0.242	-0.22
SSBMULTI	0.762	0.731	-1.14
SSB-Effectiveness	0.070	-0.067	-1.23
MANOWN	0.036	0.044	0.61
AGE	36.340	31.542	-3.22***
LOGTA	15.664	15.618	-1.64
GROWTHOPP	1.065	1.040	-2.46**
ROAA	1.265	1.166	-1.36
RISK	0.429	0.762	3.81***
TIER1	19.018	16.968	-1.67*
COSTEFF	47.710	47.520	0.84
ISLAMIC	0.428	0.427	0.75

Notes: The table presents comparison analysis of all variables used in all the regression models for the full sample of high and low FF bank. FFI2 and FF-LA are other proxies for banks financial flexibility FFI2 is an ordinary variable [0,8], indicating different levels of financial flexibility (see table 3.3.a). FF-LA takes value of 1 if their measure is higher than the mean value of the full sample for the same year, otherwise 0. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. RCE is dummy variable take value of 1 if the bank has dedicated risk committee and 0 otherwise. SSBSIZE is the total numbers of Shari'ah advisors on the board. SSBQUAL is % Shari'ah advisors with financial qualifications in the SSB. SSBMULTI is % Shari'ah advisors in SSB serving two or more additional (outside) firms. SSB-Effectiveness is factor analysis eigenvalue obtained from three SSB characteristics mentioned before. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. AGE is the difference between the sample year and the year in which the bank was established. LOGTA is the bank's size measured by natural logarithm of total assets. GROWTHOPP is banks growth opportunities measured by Tobins' Q (Equity MV plus liability BV divided by asset BV). ROAA is return on average assets. RISK is the bank return volatility measured by the SD of return on average assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise.

Table 3.4 Univariate comparison of High vs. Low FF of banks

Table 3.5 shows the Pearson pairwise correlation matrix for all the variables in the model to test for any significant inter-variable correlations. As the Table shows, no high degree of cross-correlation can be observed between the key variables. The variance inflation factors (VIFs) also show no multicollinearity problems among the regressors.[26] The table shows that banks with stronger financial flexibility tend to have more populated boards. Further, banks with a greater proportion of independent members on the board tend not to have an independent risk committee. Banks with a greater number of independent members on the board also tend to have a greater proportion of Shari'ah advisors on the board. The number of independent board members is not statistically significance and a greater board size is associated with a smaller number of independent members on the board.

[26] The pairwise test shows no coefficient value higher than 80% between the explanatory variables. Also, the VIF individual value of each variable shows no value higher 10 and no VIF means higher than 6.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
FFI (1)	1.000																						
BODSIZE (2)	0.168***	1.000																					
BODIND (3)	-0.054	-0.257***	1.000																				
RCE (4)	0.032	0.023	-0.181***	1.000																			
SSBSIZE (5)	0.087	-0.043	0.318***	-0.200**	1.000																		
SSBQUAL (6)	-0.003	-0.013	0.013	0.086	-0.005	1.000																	
SSBMULTI (7)	0.079	-0.166**	0.319***	0.120	-0.041	0.190**	1.000																
CEO-Duality (8)	0.166***	0.147***	-0.201***	0.161***	-0.010	-0.049	0.046	1.000															
MANOWN (9)	-0.028	0.049	0.043	-0.068	0.244***	0.114	-0.327***	0.063	1.000														
AGE (10)	0.140***	0.310***	-0.164***	0.051	0.046	-0.207***	0.127	0.353***	-0.138***	1.000													
LOGTA (11)	0.088*	-0.059	0.140***	-0.167***	0.286***	-0.269***	0.034	0.119**	-0.175***	0.321***	1.000												
GROWTHOPP (12)	0.135***	-0.126**	0.043	-0.264***	0.223***	-0.352***	-0.023	-0.038	0.099**	-0.038	0.307***	1.000											
ROAA (13)	0.092*	0.074	-0.135***	-0.025	-0.014	-0.044	-0.027	-0.099*	-0.008	0.138***	0.282***	0.147***	1.000										
RISK (14)	-0.231***	-0.178***	0.211***	-0.142***	0.043	0.019	0.066	-0.094*	0.054	-0.345***	-0.272***	0.003	-0.516***	1.000									
TIER1 (15)	0.081	-0.050	0.056	-0.088*	-0.188**	0.079	0.119	-0.217***	0.030	-0.295***	-0.476***	-0.017	-0.113**	0.247***	1.000								
COSTEFF (16)	-0.002	-0.107**	0.096**	0.094*	-0.036	0.028	-0.048	-0.060	0.197***	-0.263***	-0.425***	-0.245***	-0.637***	0.390***	0.488***	1.000							
LOGGDPPC (17)	-0.018	-0.452***	0.424***	-0.213***	0.164**	-0.155**	0.409***	-0.338***	-0.159***	-0.240***	0.462***	0.288***	0.002	0.161***	-0.003	-0.079	1.000						
GDPGROWTH (18)	0.051	-0.074	-0.154***	0.095*	-0.134*	-0.018	-0.093	-0.003	0.002	-0.162***	-0.024	0.089*	0.136***	-0.096**	0.085*	-0.018	0.133***	1.000					
GOVERMENT-E (19)	-0.002	-0.268***	0.268***	-0.128**	-0.007	0.222***	0.405***	-0.400***	-0.131***	-0.225***	0.209***	0.036	-0.003	0.155***	0.005	-0.071	0.714***	0.124***	1.000				
INFL (20)	-0.132***	0.106**	-0.168***	-0.095*	-0.021	-0.206***	-0.259***	0.077	0.034	0.088*	-0.012	0.069	0.024	-0.062	-0.119**	-0.073	-0.413***	-0.278***	-0.547***	1.000			
HHI (21)	-0.014	-0.017	-0.181***	0.275***	-0.287***	0.091	-0.069	-0.119**	0.152***	-0.047	-0.447***	0.026	0.039	-0.087*	0.179***	0.097*	-0.218***	-0.215***	-0.140***	-0.188***	1.000		
DIR (22)	0.034	0.279***	-0.263***	0.187***	-0.234***	-0.187**	0.022	-0.473***	-0.133***	-0.354***	0.047	-0.104**	0.120**	-0.233***	-0.220***	-0.115**	-0.570***	-0.085*	-0.512***	-0.385***	-0.241***	1.000	
LEGAL (23)	-0.135***	-0.085*	0.119**	-0.218***	0.385***	-0.213***	-0.377***	-0.536***	0.325***	-0.366***	-0.024	0.240***	0.043	0.131***	0.171***	0.030	0.143***	0.031	0.117**	0.128***	0.048	-0.468***	1.000

Notes: The table presents the Pearson pairwise correlation matrix for all variables employed in the analysis. FFI is our financial flexibility index: An ordinary variable [0,3], indicating different levels of financial flexibility (Appendix 1). BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. RCE is dummy variable take value of 1 if the bank has dedicated risk committee and 0 otherwise. SSBSIZE is the total numbers of Shari'ah advisors on the board. SSBQUAL is % Shari'ah advisors with financial qualifications in the SSB. SSBMULTI is % Shari'ah advisors in SSB serving two or more additional (outside) firms. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. AGE is the difference between the sample year and the year in which the bank was established. LOGTA is the bank's size measured by natural logarithm of total assets. GROWTHOPP is banks growth opportunities measured by Tobins' Q (Equity MV plus liability BV divided by asset BV). ROAA is return on average assets. RISK is the bank return volatility measured by the SD of return on average assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. COSTEFF is the bank cost efficiency measured by cost/net income. LOGGDPPC is the country GDP per capita measured by Natural logarithm of GDP per capita. GDPGROWTH is the GDP growth rate. GOVERNMENT-E is the government effectiveness. INFL is the annual rate of inflation. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. DIR is the deposit Interest Rate. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. *p < 0.10; **p < 0.05; ***p < 0.01 (two-tailed test).

Table 3.5 Pearson pairwise correlation matrix: full sample

3.4.2 Empirical tests

3.4.2.1 BOD effectiveness and FF

Table 3.6 presents the results for FFI (Equation: 1), where we regress FFI on the BOD, RC, and SSB monitoring mechanisms. The full-sample results are presented in Models 1-2 (Panel A). Models (3-6) are for IBs (Panel B), and Models 7-8 are for CBs (Panel C). In Models 1, 3, 5 and 7, the FFI is regressed on our primary independent variables (BOD, RC, and SSB structures) and other controls using the OLS technique for the full sample, IBs, and CBs, respectively. A different estimation method, Tobit, is also included in columns (2,4, 6, and 8).

In the full-sample tests, Panel A shows that BODSIZE is significantly and positively related to the banks' FF levels across all the estimation models. Dalton et al. (1999) assert that a larger BODSIZE offers better advice to the CEO, which helps make appropriate decisions. The proportion of outsider directors (BODIND) is not significant. These results suggest that having an effective BOD structure tends to increase the FF level, as proposed by agency and resource dependence theories. In terms of control variables, RISK reveals a significant and negative relationship with the FFI. This indicates that banks taking a lot of risks in their investment strategies tend to have higher profit volatility and reduce the available reserves of financial sources, and thus lower FF positions. This is consistent with Mollah et al. (2017a), who find that higher return volatility negatively affects a bank's financial stability. Furthermore, the GROWTHOPP result shows that growth opportunity affects a bank's FF positively, as banks with high growth opportunities tend to maintain higher FF levels to undertake future investments. The results also show consistency with previous literature, where firms with high profitability may lower their FF level (financial reserves) to decrease their costs, and because of their ability to access external funding. Another argument in the literature discusses that firms may use their funding reserves (taking a high risk) to achieve high profit.[27] As expected, we find that TIER1 affects banks' FFIs significantly and positively. The results also show that cost inefficiency affects FF negatively. LOGGDPPC, HHI, DIR, and LEGAL are also negatively associated with the FFI. The HHI and DIR results indicate that a lot of competition and high-interest rates would motivate banks to use their financial reserves (i.e., decreasing FF) to achieve more profits. The IBs' dummy variable (ISLAMIC) has a significant positive relationship with FFI across all the estimation models. This suggests that IBs have a stronger FF position than CBs. IBs are more prone to liquidity

[27] This might assure the existing of reverse causality problem (endogeneity). However, our robustness-check section controls for this problem.

risks, thus making them reserve higher liquidity and more stable funding due to their restricted access to external financing. The Government-E shows a positive effect on the banks FFI across all samples, which assures that countries with more government control mitigate risk-taking, thus enhancing the banks' FF.

On comparing IBs and CBs, we find the BOD structure has different effects on banks' FFIs. While BODSIZE affects the IBs' FFIs negatively (β = -0.127, $p < 0.05$), the CBs' BODSIZE has a positive impact (β = .147, p .01). These results support Hypothesis 1. The differences in BODs effectiveness might be explained by the arguments that we discussed in the hypothesis section, a lack of *Shari'ah* experts on the BOD, a BOD's motivation to take greater risks, and the level of a bank's complexity. Accordingly, a large BODSIZE can be costly for IBs, affecting their performance negatively, which can cause depositors and investors to withdraw their money, thus lowering their FF. In other words, BOD becomes less effective in setting financial policies in compliant with IBs clients' interests, and less effective in monitoring the management from exploiting the reserve funds. Furthermore, The IBs' characteristics exhibit a lower level of complexity than CBs. This indicates they have less need for advice, thus a small BOD size is more effective for IBs. Moreover, AGE, ROAA, COSTEFF, LOGGDPPC, HHI, and DIR have significant negative associations with FFI for IBs, but not for CBs. Younger banks can be more financially flexible because they are financially constrained. They have more cash and are more conservative when making investment decisions. A higher LOGGDPPC is associated with lower FF, which is consistent with Abedifar et al. (2013). Tier1 has a significant and positive effect on IBs' FFIs. We also find that investment opportunities have a significant positive effect on CBs' FFIs. Banks with more growth opportunities maintain higher FF levels. Interestingly, we find that the legal system has a negative effect on CBs' FFIs, indicating that CBs operating in countries with *Shari'ah* legal systems suffer from lower FF level.

3.4.2.2 Dedicated RC and FF

The results of Table 3.6 also show that the RCE is positively and significantly (β = 0.358, $p <$ 0.05) related to the FFI at the 5% level across all the estimation models. This indicates that the existence of a separate risk committee to manage and mitigate the risk-taking on banks funding and liquidity policies increases the banks' FF levels. Furthermore, the results are consistent across all sub-samples (IBs and CBs) using both estimation methods. Overall, these results suggest that having a stronger risk governance tends to reduce risk-taking, increasing the bank's FF.

3.4.2.3 SSB effectiveness and FF

Panel B in Table 3.6 shows the IBs results with the effects of their SSB characteristics on their FF. We find that SSBSIZE ($\beta = 0.225$, $p < 0.05$) and SSBMULTI ($\beta = 0.697$, $p < 0.10$) have a positive effect on IBs' FFIs. These findings are supported by the resource dependence theory and reputation hypothesis, whereby a board is more efficient by having more expert outsiders in Islamic banking and *Shari'ah* law. Members with multi-memberships have more experience, as they can learn about other firms' strategies and managerial systems (Carpenter & Westphal, 2001). Mollah & Zaman (2015) also find similar results for SSBSIZE and Islamic banks' performances when *Shari'ah* advisors have supervisory roles. Table 3.6 (Columns 5-6) also presents the results testing for SSB effectiveness after aggregating all measures of SSB. The results are consistent with our main regressions and show a positive ($\beta = 0.237$) and significant ($p < 0.05$) association between SSB effectiveness and the IBs' FF positions. Overall, the results of the SSB characteristics support each other, as more demand for *Shari'ah* expertise from members increases the number of members on the board. A bank may seek to raise the number of board seats to bring in more expertise. Overall, the additional governance layer that SSB provides plays a crucial role in assuring investors' and depositors' interests, and in enhancing client trust in banks, thus leading to the increased FF.

	Panel A: Full Sample		Panel B: Islamic Banks				Panel C: Conventional Banks	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	OLS	Tobit	OLS	Tobit	OLS	Tobit	OLS	Tobit
BODSIZE	0.068**	0.086**	-0.078*	-0.127**	-0.078*	-0.126**	0.104***	0.147***
	(0.029)	(0.037)	(0.045)	(0.055)	(0.042)	(0.056)	(0.033)	(0.040)
BODIND	-0.035	-0.001	-0.33	-0.444	-0.0962	-0.171	0.074	0.162
	(0.197)	(0.239)	(0.321)	(0.357)	(0.289)	(0.339)	(0.324)	(0.349)
RCE	0.300**	0.358**	0.449**	0.425*	0.501**	0.488**	0.372**	0.473**
	(0.143)	(0.182)	(0.197)	(0.219)	(0.198)	(0.220)	(0.179)	(0.238)
SSBSIZE			0.163*	0.225**				
			(0.091)	(0.108)				
SSBQUAL			-0.468	-0.564				
			(0.391)	(0.445)				
SSBMULTI			0.646**	0.697*				
			(0.321)	(0.359)				
SSB-Effectiveness					0.188*	0.237**		
					(0.108)	(0.117)		
CEO-Duality	0.365*	0.416						
	(0.191)	(0.267)						
MANOWN	0.391	0.456	0.259	0.249	0.103	0.096	-0.322	-0.53
	(0.566)	(0.691)	(0.807)	(0.746)	(0.837)	(0.727)	(0.796)	(1.037)
AGE	-0.001	-0.001	-0.018***	-0.024***	-0.012**	-0.015**	0.001	0.001
	(0.004)	(0.005)	(0.007)	(0.008)	(0.005)	(0.007)	(0.005)	(0.006)
LOGTA	0.011	0.028	-0.155	-0.216*	-0.168	-0.220*	0.026	0.061
	(0.063)	(0.085)	(0.112)	(0.124)	(0.106)	(0.120)	(0.093)	(0.119)
GROWTHOPP	1.240***	1.522**	0.783	0.832	0.897*	1.05	2.818**	2.971**
	(0.473)	(0.653)	(0.584)	(0.686)	(0.531)	(0.652)	(1.205)	(1.436)
ROAA	-0.187**	-0.252**	-0.349***	-0.453***	-0.372***	-0.477***	0.103	0.138
	(0.073)	(0.103)	(0.085)	(0.106)	(0.083)	(0.106)	(0.111)	(0.138)
RISK	-0.426***	-0.556***	-0.383***	-0.480***	-0.345***	-0.433***	-1.282***	-1.622***
	(0.072)	(0.106)	(0.095)	(0.102)	(0.090)	(0.101)	(0.258)	(0.317)
TIER1	0.019**	0.024**	0.038***	0.048***	0.039***	0.048***	-0.001	-0.001
	(0.008)	(0.010)	(0.010)	(0.012)	(0.010)	(0.012)	(0.013)	(0.017)

Table 3.6 Regression results on banks' governance & banks' financial flexibility

	Panel A: Full Sample		Panel B: Islamic Banks				Panel C: Conventional Banks	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	OLS	Tobit	OLS	Tobit	OLS	Tobit	OLS	Tobit
COSTEFF	-0.014**	-0.017***	-0.035***	-0.046***	-0.036***	-0.047***	-0.001	-0.001
	(0.005)	(0.006)	(0.005)	(0.008)	(0.005)	(0.007)	(0.007)	(0.009)
ISLAMIC	0.218*	0.266*						
	(0.117)	(0.154)						
LOGGDPPC	-0.324***	-0.422***	-0.552***	-0.672***	-0.423***	-0.544***	-0.149	-0.171
	(0.092)	(0.125)	(0.167)	(0.181)	(0.138)	(0.159)	(0.123)	(0.164)
GDPGROWTH	0.017	0.029	0.009	0.028	0.008	0.025	-0.022	-0.024
	(0.016)	(0.018)	(0.020)	(0.021)	(0.020)	(0.022)	(0.022)	(0.023)
GOVERMENT-E	0.346**	0.428**	0.394*	0.434*	0.355*	0.390	0.492**	0.550**
	(0.157)	(0.191)	(0.203)	(0.253)	(0.203)	(0.254)	(0.216)	(0.258)
INFL	-0.033	-0.035	0.002	0.001	-0.001	-0.001	-0.033	-0.033
	(0.021)	(0.029)	(0.039)	(0.045)	(0.039)	(0.044)	(0.028)	(0.038)
HHI	-3.280***	-4.116***	-4.352**	-5.490***	-3.424**	-4.531***	-1.610	-1.912
	(0.762)	(0.991)	(1.796)	(1.754)	(1.623)	(1.657)	(1.078)	(1.457)
DIR	-0.236***	-0.298***	-0.200***	-0.233***	-0.170**	-0.206**	-0.113	-0.135
	(0.046)	(0.064)	(0.074)	(0.089)	(0.070)	(0.083)	(0.071)	(0.092)
LEGAL	-0.548***	-0.692***	-0.109	-0.13	0.119	0.153	-0.867***	-0.993**
	(0.197)	(0.253)	(0.360)	(0.383)	(0.310)	(0.357)	(0.317)	(0.395)
Constant	5.151***	6.083***	11.64***	14.93***	10.71***	13.88***	0.416	-0.149
	(1.296)	(1.697)	(2.429)	(2.527)	(2.254)	(2.328)	(2.053)	(2.522)
YEAR EFFECTS	YES	YES	YES	YES	YES	YES	YES	YES
Observations	295	295	126	126	126	126	191	191
R^2/Pseudo	0.307	0.121	0.519	0.271	0.50	0.25	0.49	0.202
log likelihood		-369.7		-126.8		-129		-223

Note: The table presents regression results for banks' governance structure and Financial Flexibility Index (FFI) for all samples for the period 2009-2015. FFI is our financial flexibility index: An ordinary variable [0,3], indicating different levels of financial flexibility (Appendix 1). BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. RCE is dummy variable take value of 1 if the bank has dedicated risk committee and 0 otherwise. SSBSIZE is the total numbers of Shari'ah advisors on the board. SSBQUAL is % Shari'ah advisors with financial qualifications in the SSB. SSBMULTI is % Shari'ah advisors in SSB serving two or more additional (outside) firms. SSB-effectiveness is factor analysis eigenvalue obtained from three SSB characteristics mentioned before. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise MANOWN is the insider ownership measured by % shares held by executive directors to total shares. AGE is the difference between the sample year and the year in which the bank was established. LOGTA is the bank's size measured by natural logarithm of total assets. GROWTHOPP is banks growth opportunities measured by Tobins' Q (Equity MV plus liability BV divided by asset BV). ROAA is return on average assets. RISK is the bank return volatility measured by the SD of return on average assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise. LOGGDPPC is the country GDP per capita measured by Natural logarithm of GDP per capita. GDPGROWTH is the GDP growth rate, GOVERNMENT-E is the government effectiveness. INFL is the annual rate of inflation. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. DIR is the deposit Interest Rate. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Models (1, 3,5 and 7) use FFI as the dependent variable and adopt robust pooled ordinary least squares (OLS) technique. Model (2, 4, 6 and 8) use FFI dependent variables and adopt Tobit regression as robustness check to control for censored nature of the dependent variable. We exclude CEO-Duality from IBs and CBs samples due to the shortage variation in the values. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 3.6 (*Continue*)

3.4.3 Robustness checks

3.4.3.1 Endogeneity

Previous governance literature raises a concern about potential simultaneity and/or endogeneity problems. Hermalin and Weisbach (2003) declare that corporate governance empirical studies are complicated by the fact that "almost all variables of interests are endogenous" (p.8). Of particular concern in this paper is the possibility of reverse causality between corporate governance mechanisms and FF positions. Therefore, we assume that BODSIZE, BODIND, RCE, and SSB-Effectiveness are endogenous variables that might affect our results. We also assume that our banks-specific control variables can be affected by the FF positions; thus, we consider them as endogenous variables.[28] To control for endogeneity, we employ two techniques. First, consistent with the literature (i.e., Ivashina, 2009 and Fields et al., 2012), we use the lagged variables technique to control for reverse causality. In addition, following Wintoki et al. (2012), we use dynamic panel GMM estimator to alleviate endogeneity problems. Wintoki et al. (2012) highlight that the GMM estimator takes into consideration the dynamic natures of internal governance options to introduce valid and strong instruments that address unobserved heterogeneity and simultaneity.

Table 3.7 shows the results for FFI (Equation: 1), where we regress FFI on the one-year lagged value of BOD, RC, and SSB monitoring mechanisms and banks-specific control variables. The first technique results are presented in Models 1-3 for the full sample, IBs, and CBs, respectively. Different estimation methods, GMM, are also included in columns 4-6. The results of both estimators are consistent with the other applied estimations presented in table 3.6. More interestingly, we find that after we control for endogeneity, the RCE has no significant effect on the IBs FF, showing that the committee (i.e., SSB) that considers the costumers moral and religious beliefs is more important for IBs. This also could indicate that IBs FF leads them to create RC to mitigate the risk, possibly because IBs with low FFs seek to strengthen their risk governance by creating RCs, which help reduce risk-taking. To check the validity of our GMM estimations, we report a number of specification tests. First, the first-order serial correlation (*AR*(1)) shows significant results which mean that we can reject the null hypothesis, confirming that the residuals in first differences are correlated. We also report the second-order correlation (*AR*(2)) and Sargan test of over-identification restrictions. The *AR*(2) test yields a p-value of 0.738, 0.638, and 0.306 for full, IBs, and CBs respectively. This means that we cannot reject the null hypothesis of no serial correlation of second differences.

[28] We exclude the bank age of our endogeneity assumption as number of previous studies consider the firm age as exogenous variable with risk taking.

Also, the Sargan results show that we cannot reject the hypothesis that our instruments are valid. Furthermore, table 3.7 reveals the exogeneity tests of a subset of our instruments. The results of this test are 0.232, 0.216 and 0.657 for full, IBs, and CBs, respectively, showing that the additional subset of instruments (as lagged differences) are exogenous.

	Full	IBs	CBs	Full	IBs	CBs
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Tobit *lag(t-1) of independent and control variables*			GMM		
FFI (t-1)				0.235***	0.207**	0.126
				(0.086)	(0.100)	(0.096)
FFI (t-2)				0.089		-0.106
				(0.083)		(0.091)
BODSIZE	0.093**	-0.170***	0.112**	0.136**	-0.099*	0.133***
	(0.041)	(0.059)	(0.044)	(0.065)	(0.060)	(0.051)
BODIND	0.081	-0.234	0.362	0.410	-0.248	0.457
	(0.267)	(0.368)	(0.400)	(0.340)	(0.380)	(0.403)
RCE	0.418**	0.153	1.028***	0.589**	0.331	0.705**
	(0.197)	(0.224)	(0.258)	(0.286)	(0.239)	(0.329)
SSB-Effectiveness		0.293**			0.295**	
		(0.131)			(0.134)	
CEO-Duality	0.503*			0.688		
	(0.288)			(0.478)		
MANOWN	0.418	-0.108	-0.677	2.599**	-0.056	-0.108
	(0.787)	(0.837)	(1.174)	(1.228)	(0.917)	(1.607)
AGE	0.001	-0.006	0.010	-0.004	-0.017**	0.012*
	(0.006)	(0.008)	(0.007)	(0.007)	(0.008)	(0.007)
LOGTA	0.006	-0.255*	-0.030	0.123	-0.006	-0.026
	(0.097)	(0.132)	(0.132)	(0.136)	(0.127)	(0.151)
GROWTHOPP	1.672**	1.233	4.099**	-0.250	0.437	1.196
	(0.808)	(0.800)	(1.590)	(0.936)	(0.743)	(2.125)
ROAA	-0.269**	-0.425***	-0.005	-0.241*	-0.320***	0.262*
	(0.112)	(0.114)	(0.148)	(0.141)	(0.108)	(0.159)
RISK	-0.401***	-0.376***	-1.473***	-0.254*	-0.206**	-0.784**
	(0.112)	(0.107)	(0.375)	(0.151)	(0.104)	(0.378)
TIER1	0.031***	0.061***	-0.034*	0.032**	0.024*	0.022
	(0.011)	(0.013)	(0.019)	(0.015)	(0.013)	(0.025)
COSTEFF	-0.025***	-0.048***	-0.037***	-0.021**	-0.026***	0.007
	(0.007)	(0.008)	(0.010)	(0.009)	(0.007)	(0.012)
ISLAMIC	0.355**			0.433		
	(0.178)			(0.265)		
LOGGDPPC	-0.469***	-0.665***	-0.425**	-0.212	-0.336**	-0.057
	(0.146)	(0.189)	(0.188)	(0.174)	(0.151)	(0.195)
GDPGROWTH	0.013	-0.012	-0.009	-0.009	-0.003	-0.040
	(0.022)	(0.025)	(0.028)	(0.027)	(0.024)	(0.029)
GOVERMENT-E	0.531**	0.762***	0.742**	0.389*	0.251	0.748***
	(0.219)	(0.285)	(0.289)	(0.216)	(0.250)	(0.270)

Table 3.7 Robustness check: relationship between banks' governance and banks' financial flexibility after control for endogeneity

	Full	IBs	CBs	Full	IBs	CBs
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES		**Tobit** *lag(t-1) of independent and control variables*			**GMM**	
INFL	-0.059	-0.047	-0.041	0.015	0.012	0.050
	(0.037)	(0.055)	(0.046)	(0.040)	(0.055)	(0.043)
HHI	-4.309***	-4.016**	-4.109**	-0.007	-1.598	-1.251
	(1.167)	(1.794)	(1.672)	(1.523)	(1.840)	(1.740)
DIR	-0.269***	-0.090	-0.222**	-0.153	-0.045	-0.062
	(0.077)	(0.100)	(0.104)	(0.098)	(0.097)	(0.110)
LEGAL	-0.598**	0.477	-1.217***	-0.583*	0.302	-1.318***
	(0.299)	(0.389)	(0.448)	(0.350)	(0.421)	(0.485)
Constant	6.425***	14.85***	5.272*	0.896	6.681***	-0.824
	(1.885)	(2.534)	(2.721)	(2.686)	(2.292)	(3.447)
YEAR EFFECTS	Yes	Yes	Yes	Yes	Yes	Yes
Observations	249	106	161	216	112	140
R^2/Pseudo	0.122	0.262	0.226			
log likelihood	-317.5	-109.4	-184.63			
AR (1) test (p-value)				0.000	0.000	0.000
AR (2) test (p-value)				0.738	0.638	0.306
Sargan test of over-identification (p-value)				0.184	0.26	0.631
Diff-in- Sargan test of exogeneity (p-value)				0.232	0.216	0.657

Note: The table presents regression results for banks' governance structure and Financial Flexibility Index (FFI) for all samples for the period 2009-2015 after controlling for endogeneity. FFI is our financial flexibility index: An ordinary variable [0,3], indicating different levels of financial flexibility (Appendix 1). FFI(t-1) and FFI(t-2) is the lone year and two years lagged respectively. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. RCE is dummy variable take value of 1 if the bank has dedicated risk committee and 0 otherwise. SSBSIZE is the total numbers of Shari'ah advisors on the board. SSBQUAL is % Shari'ah advisors with financial qualifications in the SSB. SSBMULTI is % Shari'ah advisors in SSB serving two or more additional (outside) firms. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise MANOWN is the insider ownership measured by % shares held by executive directors to total shares. AGE is the difference between the sample year and the year in which the bank was established. LOGTA is the bank's size measured by natural logarithm of total assets. GROWTHOPP is banks growth opportunities measured by Tobins' Q (Equity MV plus liability BV divided by asset BV). ROAA is return on average assets. RISK is the bank return volatility measured by the SD of return on average assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise. LOGGDPPC is the country GDP per capita measured by Natural logarithm of GDP per capita. GDPGROWTH is the GDP growth rate. GOVERNMENT-E is the government effectiveness. INFL is the annual rate of inflation. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. DIR is the deposit Interest Rate. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Models (1-3) regress the main explanatory and control variables as one year lagged value of the FFI adopting Tobit technique. Model (4-6) use FFI dependent variables and adopt GMM regression as robustness check to control for all endogeneity types. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 3.7 (*Continued)*

3.4.3.2 Extending the analysis sections

We use two alternative measures of FF. First, we add five other ratios that are used in Doumpos et al. (2016)'s study in addition to our three primary ratios (Stable funding, liquid assets to total assets, and Z-score). These are capital adequacy ratio, loan losses provision ratio, cost-to-income ratio, liquid assets to deposits and short-term funding ratio, and profitability ratio. Doumpos et al. (2016) use these ratios to create an overall financial strength index for banks based on CAMEL framework categories. Following our previous mechanism to create a FF index (see Appendix A), we create FFI2 to measure each banks FF position. We also use a different measure of FF, liquid assets to total assets (FF-LA). We create a dummy variable for this proxy, taking a value of 1 if the value of that proxy was higher than the mean value of the full sample in the same year, 0 otherwise.

Table 3.8 presents the regression, examining the relationship between the corporate governance structure (BOD, RCE and SSB) on the banks' FFs using the two different measures. The full sample results are presented in Models 1-2. Models 3-4 are for the IBs (Panel B), and Models 5-6 are for the CBs (Panel C). We use Tobit model for FFI2 across all samples, and we use the Probit model to control for the binary dependent variable (FF- LA). We find that the results still hold across all our main explanatory variables. Interestingly, the results using both new measures for FF show that BODIND has a negative and significant effect on the IBs' FFs, whereas it has a positive impact on the CBs' FFs when the FFI2 is used. The RCE results are also consistent with our results after controlling for endogeneity, that RCE affects the CBs' FFs positively across both measures, but it does not affect IBs' FFs. Furthermore, the SSB qualification also has a negative and significant relationship with the IBs' FFs, thus showing that members with financial qualifications take higher risks for IBs, resulting in a decrease of their FF.

We also include the G-Index to control for the corporate governance level in each country after removing the Government-E. Table 3.8 reports this test, which shows consistent results with our main base-line regressions. However, even though the G-Index has no significant effect on the FFI2 for the full and CBs samples, it has a significant and positive impact on the IBs' FFI2s.

	Panel A: Full Sample		Panel B: Islamic Banks		Panel C: Conventional Banks	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	FFI2	FF-LA	FFI2	FF-LA	FFI2	FF-LA
BODSIZE	0.087**	0.101*	-0.152**	-0.252**	0.085*	0.148*
	(0.041)	(0.053)	(0.075)	(0.100)	(0.045)	(0.081)
BODIND	-0.103	-0.243	-0.982*	-1.663**	0.644*	-0.912
	(0.272)	(0.354)	(0.525)	(0.815)	(0.384)	(0.659)
RCE	0.566***	0.638**	0.198	0.169	0.755***	0.764*
	(0.210)	(0.277)	(0.329)	(0.466)	(0.267)	(0.395)
SSBSIZE			0.190	0.587**		
			(0.154)	(0.245)		
SSBQUAL			-0.592	-2.470***		
			(0.623)	(0.892)		
SSBMULTI			0.973*	2.688***		
			(0.512)	(0.937)		
CEO-Duality	0.742**	0.079				
	(0.313)	(0.403)				
MANOWN	1.340*	1.365	0.726	-0.230	1.134	0.750
	(0.783)	(1.126)	(1.061)	(1.551)	(1.162)	(1.678)
AGE	-0.013**	0.000	-0.026**	-0.039**	-0.017***	0.011
	(0.005)	(0.007)	(0.011)	(0.016)	(0.006)	(0.013)
LOGTA	0.163*	0.182	-0.255	-0.872***	0.632***	0.677***
	(0.096)	(0.126)	(0.178)	(0.283)	(0.133)	(0.213)
GROWTHOPP	-0.069	0.562	1.421	3.425**	-1.757	-7.154***
	(0.739)	(0.962)	(0.964)	(1.493)	(1.633)	(2.344)
ROAA	-0.326***	-0.489***	-0.529***	-0.219	0.523***	-0.513**
	(0.124)	(0.171)	(0.164)	(0.220)	(0.148)	(0.226)
RISK	-0.772***	-0.386**	-0.597***	-0.863***	-1.604***	-0.415
	(0.135)	(0.160)	(0.160)	(0.231)	(0.345)	(0.526)
TIER1	0.106***	0.027*	0.097***	0.031	0.111***	0.047*
	(0.011)	(0.014)	(0.017)	(0.025)	(0.019)	(0.028)

Table 3.8 Robustness check: banks' governance and banks' financial flexibility using alternative measures of financial flexibility

	Panel A: Full Sample		Panel B: Islamic Banks		Panel C: Conventional Banks	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**FFI2**	**FF-LA**	**FFI2**	**FF-LA**	**FFI2**	**FF-LA**
COSTEFF	-0.070***	-0.020**	-0.085***	-0.029*	-0.055***	-0.010
	(0.007)	(0.009)	(0.011)	(0.015)	(0.010)	(0.015)
ISLAMIC	0.368**	0.490**				
	(0.175)	(0.228)				
LOGGDPPC	-0.886***	-0.379*	-1.533***	-1.111***	-1.061***	-0.432
	(0.162)	(0.212)	(0.288)	(0.423)	(0.214)	(0.314)
GDPGROWTH	0.054**	-0.006	0.057*	-0.024	0.013	0.076**
	(0.021)	(0.028)	(0.030)	(0.039)	(0.026)	(0.033)
INFL	-0.064*	-0.183***	-0.063	-0.073	-0.097**	-0.172
	(0.034)	(0.047)	(0.066)	(0.086)	(0.042)	(0.070)
HHI	-5.352***	-0.604	-7.972***	-9.526**	-4.844***	2.367
	(1.209)	(1.526)	(2.378)	(3.802)	(1.726)	(2.180)
DIR	-0.413***	-0.127	-0.308**	-0.273	-0.441***	-0.163
	(0.073)	(0.097)	(0.126)	(0.181)	(0.102)	(0.146)
G-Index	0.479	-0.506	1.429***	0.507	0.333	-0.300
	(0.309)	(0.417)	(0.522)	(0.783)	(0.436)	(0.581)
LEGAL	-0.675**	-0.403	0.246	-0.574	-1.189**	-0.707
	(0.288)	(0.387)	(0.529)	(0.809)	(0.496)	(0.672)
Constant	15.301***	2.200	28.540***	27.500***	10.440***	1.089
	(2.126)	(2.762)	(3.914)	(6.708)	(3.054)	(4.275)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	286	300	119	131	189	203
R-squared	0.226	0.22	0.2887	0.343	0.264	0.35
Wald Chi^2	236.98	88.44	129.76	74.62	179.17	73.68
Log likelihood	-405.79	-162	-159.85	-59.61	-249	-91.404

Note: The table presents regression results for banks' governance and different measures of bank's Financial Flexibility Index (FFI2 and Liquid assets) for all full and sub samples for the period 2009-2015. FFI2 and FF-LA are other proxies for banks financial flexibility FFI2 is an ordinary variable [0,8], indicating different levels of financial flexibility (see Appendix 1). FF-LA takes value of 1 if their measure is higher than the mean value of the full sample for the same year, otherwise 0. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. RCE is dummy variable take value of 1 if the bank has dedicated risk committee and 0 otherwise. SSBSIZE is the total numbers of Shari'ah advisors on the board. SSBQUAL is % Shari'ah advisors with financial qualifications in the SSB. SSBMULTI is % Shari'ah advisors in SSB serving two or more additional (outside) firms. SSB-effectiveness is factor analysis eigenvalue obtained from three SSB characteristics mentioned before. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. AGE is the difference between the sample year and the year in which the bank was established. LOGTA is the bank's size measured by natural logarithm of total assets. GROWTHOPP is banks growth opportunities measured by Tobins' Q (Equity MV plus liability BV divided by asset BV). ROAA is return on average assets. RISK is the bank return volatility measured by the SD of return on average assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise. LOGGDPPC is the country GDP per capita measured by Natural logarithm of GDP per capita. GDPGROWTH is the GDP growth rate, INFL is the annual rate of inflation. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. DIR is the deposit Interest Rate. G-Index is country corporate governance quality measured by six indicators. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Model (1,3 and 5) use FFI2 dependent variables and adopt Tobit regression to control for censored nature of the dependent variable. Model (2, 4,and 6) use FF-LA dependent variables and adopt Probit regression to control for Binary nature of the dependent variable. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 3.8 *(continued*

3.5 Conclusion

This study examines how governance structure differences between Islamic and conventional banks affect their financial flexibility positions. More specifically, the study investigates how board of directors' structures and its sub-committee (specifically the risk committee) affect the financial flexibility of conventional and Islamic banks. Furthermore, the additional governance layer of Islamic banks, the SSB, is also studied. The sample consists of 65 listed banks from 11 Middle East and North Africa countries between 2009-2015. The results of the full sample suggest that large board of directors size increases the banks financial flexibility. This implies that large board size enhances the BOD advising and monitoring roles, which in turn help in making appropriate decisions and preventing manager from exploiting the bank financial resources, thus the banks financial flexibility should be enhanced. The BOD roles can be made to be more efficient by adjusting BOD structure (Boone et al., 2007; Coles et al., 2008; Linck et al., 2008). Yun (2008) and Caprio et al. (2011) argue that an effective corporate governance guides efficient financial policies. Furthermore, La Porta et al. (1997) argue that an effective board might inhibit managers from exploiting the firm's financial resources and maintain a good financial reserve position. As proposed by agency and resources dependence theories, BOD that provides effective monitoring and advisory roles can help in making efficient decisions toward financial policies. Based on the perspectives of the resource dependence theory, large board size provides access to external sources in other firms and bring better advice to the firm' management which in turn enhances the firm decision making process (Dalton et al., 1999).

Comparing between IBs and CBs, the study reveals a positive relationship between board size and financial flexibility for conventional banks. However, for Islamic banks, board size is negatively associated with financial flexibility. This implies that large board size is only effective for CB, whereas small board size is relatively more effective for IBs. The arguments that were discussed section 3.2.2 might explain the differences in BOD size effect between CBs and IBs. Specifically, a lack of *Shari'ah* experts on the BOD, BOD's motivations to take greater risks, and the level of a bank's complexity can make large board size on IBs less effective. Thus, the board abilities to set financial policies in compliance with IBs clients' interests, and monitor the management from exploiting the reserve funds would be reduced. Accordingly, large board for IBs will not be able to outweigh their costs, which in turn might affect the bank performance negatively, which can cause depositors and investors to withdraw their money, thus lowering their FF. This study provides evidences that dissimilarities in

governance structures, business models, and complexity between the two types of banks are responsible for the differences in effectiveness of their boards of directors regarding financial flexibility. This is consistent with (Mollah et al., 2017a and Mollah et al., 2017b), who found differences in the effects of governance strucutre on risk-taking between CBs and IBs.

In term of independent directors on the board, the study shows insignificant associations between the proportion of outsider directors on the board and banks financial flexibility for both banking systems. This findings are consistent with other studies (e.g. Adams and Mehran, 2012), who find no significant relationship between outsider on the board and financial performances under very high regulated sectors. The reason for this might be because of regulatory restrictions in the financial sectors, that limit the roles of outsider directors. Regulators provides extensive regulations toward stability of financial institutions, which makes monitoring to be continued in the financial sector (Pathan, 2009).

Similarly, as regulators recommend the creation of a separate risk committee to monitor and mitigate risk-taking in banks, we study this suggestion and find that a dedicated board risk committee can play a positive role in affecting both conventional and Islamic bank's financial flexibility. This indicates that the existence of dedicated risk committee that monitors and mitigates risk-taking regarding funding and liquidity policies can enhance banks financial flexibility. The findings are consistent with Ames et al. (2018) who find that higher financial strength rating is associated with board risk committee existance.

Moreover, as an additional governance layer of Islamic banks, the *Shari'ah* supervisory board has shown to have a positive effect on the banks' financial flexibility positions. Particularly, *Shari'ah* supervisory board size and fraction of members with multi-directorships positively impact the financial flexibility. Mollah & Zaman (2015) also find similar results for SSB size and performances of IBs. Besides, the findings are supported theoretically by the resources dependence theory and reputation hypothesis, whereby large *shai'ah* supervisory board size tend to have more expert outsiders in Islamic banking and *Shari'ah* laws, which make SSB more effective. Members with multi-memberships conduct effective monitoring because of their experiences, which can enhance IBs clients trust and bring more depositors, which in turn increase the IBs financial flexibility. SSB results support the argument that traditional governance mechanism (i.e. shareholder view) is dominated in the IB section besides the adoption of the additional layer SSB as governance mechanism in meeting other stakeholder interests.

Our evidence shows that Islamic banks' governance structures enhances financial flexibility by favouring conservative funding and liquidity policies. This is supported by our results, which show a positive association between Islamic bank and financial flexibility. One reason of why IBs might reserve higher financial flexibility level is because of the *Shari'ah* restrictions on IBs access to external short wholesales funds. Moreover, this study brings new evidence to the banking industry by showing that Islamic banks are considered simple firms that need less advice from their boards while conventional banks are complex, requiring more advice from their boards. This study provides useful knowledge that can be used by regulators and policymakers in the banking industry. Future research can extend the investigation of corporate governance effect on financial flexibility by employing a global sample. Further research also needs to be developed in this particular area to investigate the effectiveness of risk committees by considering their characteristics and their effect on banks' financial flexibilities.

Chapter 4. Do Banks Effectively Manage their Risks? The Role of Risk Governance

4.1 Introduction

Risk-taking has traditionally been a serious issue in the financial industry, and the recent financial crisis of 2008 raised its profile significantly. Shareholders are interested in the high risk-taking behaviour that can be taken by the management with the aim of maximising their wealth. However, in practice, high risk-taking does not necessarily mean high returns unless the risk-taking action is undertaken effectively. Nevertheless, an effective board can protect the shareholder's interests by preventing the management from taking excessive risks for their own benefit rather than for shareholders'. Directors may also worry about the reputational and monetary loss which can be a consequence of a lawsuit, which is quite likely happen if a bank takes high risks (Sun and Liu, 2014). Therefore, a highly effective board may impose constraints on management risk-taking in order to protect their reputation. As a result, an effective board can mitigate risk-taking.

Research on the relationship between board governance effectiveness and risk-taking is still limited, and existing studies provide inconclusive results. Minton et al. (2014) find that having independent directors with financial experience, as an indicator of a high-quality board, leads to an increase in a bank's risk-taking. Pathan (2009) concludes that stronger board is negatively associated with bank's risk-taking. However, other researchers have found no relationship between board quality and risk-taking. Notably, Erkens et al. (2012) document that independent members on the board do not affect banks' risk-taking. Also, Sila et al. (2016) find no significant association between board diversity and risk-taking.

Interestingly, boards oversee risk through their committees. Sun and Liu (2014) find that banks with busy members and short tuner audit committees tend to undertake higher risks. However, In the wake of the recent financial crisis, many economists, public policy makers, regulators and scholars have strived to put in place the implementation of enterprise risk management (ERM), i.e., addressing all the risks comprehensively and coherently (Bromiley et al. 2015), to enhance the governance of the risk management system (Lundqvist, 2015). This comprises a dedicated committee (termed a board risk committee)[29] that is specifically

[29] In practice, firms can form their risk committees either at the management level or at the board level. In this study, all risk committees refer to the one formed at the "board level". We only consider banks are having a stand-alone board-level risk committee if their annual reports include the term of "risk" in their board committee such as "Board Risk Committee", "Risk Policy Committee", "Risk Management Committee", or "Risk and Assets Committee".

responsible for the bank's risk assessment and management. The significance of the board risk committee (RC) is that it is explicitly instituted to manage and monitor risks issues. This critical 'risk supervising' function of the board risk committee has received much attention from both academics and practitioners as a result of the crisis. Another important risk governance mechanism that has been recently assigned by the regulators is the position of Chief Risk Officer (CRO). Many banks have adopted the appointment of a CRO as the person responsible for risk management overall. Although the RC and the CRO have been proposed to bear the accountability for the oversight of risk management, there are only few studies, i.e. (Lingel and Sheedy, 2012; Ellul and Yerramilli, 2013; Tao and Hutchinson, 2013), which provide evidence on how these two mechanisms affect a bank's risk management. Besides, these studies only investigate the influences of risk governance on specific type of risks (e.g. market risk and credit risk). However, according to the Basel Committee on Banking Supervision (BCBS) regulation, the rigorous corporate governance is responsible for all the material risks banks face (e.g., credit, market, liquidity, operational risks) (BCBS, 2001; 2008b). The Islamic Financial Services Board (IFSB) and previous literature also consider these risk perspectives as major risks that financial institutions encounter (IFSB, 2005; Sun and Chang, 2011; Iqbal, 2013; Acharya and Mora, 2015). Therefore, risk governance's influence should be spread out over a great deal more than just specific risks that the existing literature has studied. Therefore, this paper aims to provide further investigations concerning this research gap.

In particular, first, this study investigates whether risk governance mechanisms (board RC and CRO) have a relationship with the risk-taking of banks, focusing on five critical risk perspectives in terms of banking activities: market risk, credit risk, operational risk, liquidity risk, and insolvency risk. Given that regulators have been putting pressure on banks to strengthen their corporate governance-related to risk management monitoring since the financial crisis, we take 2009 to 2015 as our sample period. We employ a sample of 28 CBs and 37 IBs pertaining to this period and found a negative association between the risk governance index and all five investigated bank risk perspectives. Our findings suggest that board RC and CRO mechanisms might be effective in lowering all aspects of banks' risk-taking. Second, this study is the first to take into consideration the risk governance mechanisms of IBs; these have different operational systems, and their governance structure is different from that of the CBs.[30] However, to our knowledge, only one previous study,

[30] Islamic banks have to be compliant with Shari'ah principles and have additional governance layer, so-called Shari'ah Supervisory board.

Mollah et al. (2017a), investigate the different relationships between board governance and risk-taking across both Conventional and Islamic banks. They find that high-quality board governance leads to higher risk-taking in Islamic banks as compared to Conventional banks — due to the IBs more complicated operational systems and their different governance structure. Nevertheless, their study do not consider how a sub-committee responsible for risk-management monitoring can affect the banks' risk-taking. Thus, this study will provide additional work on the impacts of corporate governance mechanisms on risk-taking for both types of banks by investigating the risk governance's role in affecting banks risk-taking. Overall, we find that the impacts of risk governance mechanisms within IBs are relatively similar to those created by the risk governance mechanisms within CBs across all aspects of risk except for that of credit risks — for which the effects virtually disappear. In other words, board RCs and CROs in IBs seem not as influential to credit risks as those in CBs. Third, our study examines whether risk governance mechanisms (board RCs and CROs) moderate the relationship between bank risk-taking and performance. Through this investigation, the study can provide indications about the role of risk governance on the effectiveness of bank risk management. To the best of our knowledge, no study has investigated this important matter. Overall, we find stronger risk governance has a positive influence on risk management effectiveness (i.e., this is the positive relationship between performance and risk-taking). However, this improvement in terms of risk-taking management which is caused by stronger risk governance is almost undetectable in IBs.

This study contributes to the previous literature in several ways. First, it extends the limited literature on the relationship between the effectiveness of the board of directors and risk-taking. Previous studies (e.g., Pathan, 2009; Erkens et al., 2012; Minton et al., 2014; Sila et al., 2016) take only board characteristics (e.g. BOD size and independence) into account when examining the board quality's effects on bank risk-taking. However, in our study, we focus on two particular mechanisms of risk governance, i.e. the board risk committee and the Chief Risk Officer. The rationale for this focus is their direct roles in assessing and monitoring bank risks and risk management per se, and the growing literature on the role in risk governance mechanisms of both RCs and CROs. Previous studies in this area such as (Aebi et al., 2012; Baxter et al., 2013; Al-Hadi et al., 2016; Nahar et al., 2016; Ames et al., 2018) investigate the role of both/or one of these risk governance mechanism in monitoring and affecting the firms' performance, value, financial strength rating, and risk disclosure. Despite such trends, only a few studies investigate how risk governance might affect risk-taking (Lingel and Sheedy, 2012; Ellul and Yerramilli, 2013; Hines and Peters, 2015). These

studies only focus on specific risk-taking perspectives, whereas our study takes a comprehensive picture of risk-taking by looking at five main risk aspects: market, credit, operational, liquidity, and insolvency risks. As a methodological contribution, our study not only examines these five risk aspects separately but also constructs one single index that includes all of them using factor analysis approach. Furthermore, in creating our risk governance index, unlike Ellul and Yerramilli (2013)'s study, we consider more RC characteristics when capturing the board RC oversight role in risk management. Another contribution of our study is the investigation of the matter in relation to IBs; this has not been covered before. Specifically, we examine and contrast the findings across both banking systems, CBs and IBs. Finally, unlike prior studies, we are not only interested in how risk governance influences risk-taking, but also, we attempt to explore whether the risk governance mechanisms can improve the effectiveness of bank risk management. Since greater scrutiny regarding the risk oversight of board governance has recently been imposed by regulators, especially after the financial crisis, it is important to discover how RC and CRO can effectively manage and monitor bank risks.

The remained of this paper is structured as follows. Section 4.2 provides a review of related literature and hypothesis development. The data and the methodology are presented in section 4.3. Section 4.4 demonstrates the empirical results and discusses them. Section 4.5 concludes the paper.

4.2 Literature review and hypothesis development

4.2.1 Risk Governance and risk-taking

The 2007-2008 financial crisis motivated many parties (including researchers and commissions) to investigate the causes behind it. Recent literature discusses the significant influences of risk management on the extent to which firms were affected by the financial crisis (Brunnermeier, 2009). In particular, the US financial crisis inquiry commission published reports stating that the main reason for the crisis was that some financial firms were embedded with many excessive risk-taking strategies. As a result, many changes to the pertinent regulations have been made which emphasise the importance of developing and enhancing risk management functions.

Previous studies e.g. (Kashyap et al., 2008; Stulz, 2008; Ellul and Yerramilli, 2013; Meidell and Kaarbøe, 2017), emphasise the important functions of risk management and the need for risk identification as well as the avoidance of excessive risk-taking, as these cannot be

managed entirely by external market discipline or supervisory regulators. Meidell and Kaarbøe (2017) assure that constructing a risk technology function enhances a firm's decision-making process. Baxter et al. (2013) investigate the determinants of high-quality (ERM) of 165 US financial firms from 2006 to 2008, and how ERM affected their risks and performances. They find that firms with low-quality enterprise risk management encounter higher risks. Regulatory supervision, i.e. (BCBS, 2011), also enhances the roles of risk management by forcing financial institutions to put in place a comprehensive risk management mechanism. The BCBS defines risk management as a structured approach to the recognition and understanding of the risks which may be encountered by institutions and their outcomes. Mokni et al. (2015) state that an effective risk management framework can reduce bank risks and promote a bank's ability to compete in the market.

To improve the risk management function, corporate governance codes globally emphasise the importance of enhancing the risk governance mechanism. Typically, they recommend creating a dedicated board risk committee and assign a Chief Risk Officer to oversee and be responsible for the overall risk-taking management of the firms (Brown et al., 2009; Lundqvist, 2015). Lundqvist (2015) argues that enterprise risk management encompasses two factors, traditional risk management and risk governance mechanisms, with the latter being more important than the former. Ames et al. (2018) state that risk governance should integrate with firm-wide risk management. Many countries update their corporate governance codes to include risk governance practices.[31]

Other studies assure the important roles of board RCs and CROs in enhancing risk management quality. Baxter et al. (2013) find that a higher quality of ERM is associated with better corporate governance (including the presence of RCs and CROs). However, a growing debate concentrates on whether the board should be fully responsible for risk oversight, or whether risk oversight should be assigned to either an Audit Committee (AC) or a dedicated Risk Committee (Protiviti, 2011). Many firms have the Audit Committee as the responsible

[31] For example, many MENA countries released an amendment of principles related to more effective governance mechanisms for both types of banks. These include: The Saudi Arabian Monetary Agency (2014, Principle 4, Article 78), The Central Bank of Bahrain (2018, Principle 1, Section1), Kuwait Capital Market Authority (2013, Principle 5.1), The Qatar Central Bank (2015, Principle 4), The Central Bank of Jordan (2016, Article 10), The Central Bank of Egypt (2016, Principle 5, article 5.2.30), The Central Bank of Tunisia (2016), The Central Bank of the UAE (2010), and The Palestine Monetary Authority (2014). These amendments note that a sub-board committee (i.e. a Risk Committee) explicitly focusing on risk matters can represent a stronger governance mechanism, assisting the full board in conducting its responsibility of risk oversight more effectively.

body for the oversight of risks, based on the argument that AC members possess sufficient financial experience to manage the risks. Nevertheless, taking into consideration the complexity of the risks that are faced by financial firms and the other responsibilities of AC members (i.e., monitoring and processing the financial reports), the latter might not have enough time to adequately exert their skills and expertise in order to assess and manage a firm's overall risks (Field et al., 2013). On the other hand, separate board RCs can give more effort and time to the investigation and management of firm-wide risks (Brown et al., 2009). Andres and Vallelado (2008) state that because of the high exposure to different types of risk in the financial sector (e.g. market, credit, liquidity, trading, regulatory, capital, and compliance risk), a separate board RC has become more prevalent and popular in this sector. Consequently, corporate governance literature start to pay more attention to the Risk Committee roles (Aebi et al., 2012; Lingel and Sheedy, 2012; Ellul and Yerramilli, 2013; Al-Hadi et al., 2016).

According to the institutional theory, the adoption of risk management practices and policies may be driven by the institutional framework within which an organisation operates (Brown et al. 2009). Specifically, firms may apply specific governance mechanisms in order to monitor specific activities. Our argument is consistent with this theory since we expect that specific risk governance mechanisms can enhance a bank's risk-taking behaviour. Specifically, the existence of a board Risk Committee and a Chief Risk Officer can enhance all aspects of a bank's risk-taking. Therefore, we build our hypothesis based on the idea that banks can use a board Risk Committee along with a CRO as a substantive monitoring mechanism in order to create positive change within their organisations.

Though previous works in the literature (Laeven & Levine, 2009; Pathan, 2009; Minton et al., 2014; Mollah et al., 2017) focus on the corporate governance's (e.g. BOD, CEO, and ownership) effects on the control and mitigation of a firm's risk-taking behaviours, there is still a window of opportunity for further investigation of risk governance mechanisms (RCs and CROs) in the banking system. A few studies investigate the ways in which risk management systems, overall, influence risk-taking decisions. Ellul and Yerramilli (2013) construct a risk management index (RMI), which included both board RC and CRO dimensions, to measure the risk governance mechanism's effects on the risk-taking within 100 of the US's largest banks in the period 1995-2010. They find that banks with a higher RMI have a lower tail risk before crises, lower non-performing loans, and better accounting and marking stock performance during crises. Overall, their results suggest that a stronger

RMI can mitigate the banks' risk level. Using a sample of 60 financial institutions over the period 2004-2010, Lingel and Sheedy (2012) discover that Risk Committee activities, members with risk management expertise in the risk committee, the presence of a CRO in the executive team, and a CRO ranked within the highest five paid are determinants of risk outcomes. Tao and Hutchinson (2013) investigate the influences of Risk Committees and compensation committees on firms' risk behaviours and found that the compositions of risk and compensation committees are positively associated with firm's market risks. Hines and Peters (2015) investigate financial institutions which have a voluntary Risk Committee. The results of their study show significant effects from the RCs on risk outcomes. This confirms that the creation of an RC reduced the gravity of egregious risk outcomes and used as a governance mechanism to monitor the risk activities.

Despite the number of studies on the association between risk governance mechanisms (RCs and CROs) and risk-taking, the focus has remained on certain type of risks (e.g. market risks and credit risks). Other types of risks (e.g., liquidity and insolvency) have not been investigated. In fact, after reviewing the regulations and many banks' reports, we find that the RC's responsibilities are not only limited to any particular type of risk. Instead, the responsibilities refer to the establishment of effective policies and monitoring for all type of risks. For instance, the annual report of Ithmaar Bank (2015) indicate that "The primary objectives of the Risk Policy Committee are to make recommendations to the Board in relation to the Bank's overall risk appetite and tolerances and the policies within which to manage the aforementioned [risks polices]. These policies are defined as credit risk, market risk, operational risk and liquidity risk in addition to any other risk category the Bank faces in carrying out its activities. The Risk Policy Committee also recommends and monitors the Bank's overall risk management framework which involves developing across all business activities and operations policies, internal controls, methods of risk management, compliance procedures and methods of reporting to the Board" (p.35). Furthermore, Moore and Brauneis (2008) and Schlich and Prybylski (2009) state that the role of a board Risk Committee is to monitor and oversee a firm's comprehensive risk management. Comprehensive risk management should focus on, but not be limited to, financial risks, credit risks, market risks, operational risks, and liquidity risks. Consequently, this study adds to the literature by covering five main risks: market, credit, liquidity, operational, and insolvency, to capture a better picture of board RC and CRO influences on bank risks.

The board is more sensitive to regulatory compliance regarding the management of risk-taking (i.e., regulators place more pressure on the board in regard to managing and accessing risks), and so the BOD will tend to act more conservatively than the other bodies, so as to reduce the legal liability and/or the reputational loss which would result from the bank's failure (Sun and Liu, 2014). Pathan (2009) finds a negative relationship between a strong board and risk-taking.[32] Other studies (Cheng et al., 2010; Sun and Liu, 2014) find that an effective audit committee reduces the market risk at the level of the bank as a whole. Since recently the board of directors manage and monitor management's risk-taking activates through its risk committee, it can be argued that an effective board risk committee might also act to reduce a bank's risk-taking activates regarding regulatory compliance. Supporting this argument, Ellul and Yerramilli, (2013) find that a stronger risk management index, encompassing the Risk Committee and the Chief Risk Officer, lowers a bank's market risks. Consequently, based on the findings of previous literature and the arguments above, we hypothesise that an effective risk governance mechanism can mitigate all types of risk.

H1a: There is a significant and negative association between risk governance mechanisms and all type of risks.

4.2.2 IBs and risk management

Another gap in previous studies is that all of the empirical studies investigate this matter using only samples involving conventional banks. However, Islamic banks have different characteristics, driven by their compliance with *Shari'ah* principles[33]. Thus, the risk management concepts and practices in IBs vary as well because of the unique requirement for Shari'ah compliance and the nature of Islamic financial products. The IFSB and the relevant banking literature state that IBs are exposed to significant risks in the course of business transactions with customers (Iqbal, 2013; Safiullah and Shamsuddin, 2018). Furthermore, IBs are exposed to additional source of risk beside the conventional types of risk- that is *Shari'ah* risk (*Shari'ah* compliancy risk*).* Iqbal (2013) defines *Shari'ah* risk as the risks that occur as a result of violating the *shari'ah* principles. *Shari'ah* risk is also defined as the risk of being default as consequences of breaking the *Shari'ah* principles (Archer and Haron, 2007). It is important to note that breaking up the *Shari'ah* principles can lead to various problems,

[32] Pathan (2009) defines strong board as having small board size, high proportion of independent member, and less restrictions on shareholders right (measured by staggered board and poison pill).
[33] Shari'ah principles prohibit charging interest on money, investing in prohibited projects (i.e. gambling, alcohol, and pork), taking excessive risk, and all investment should rely on real economic assets.

including liquidity, stability, and profitability. IFSB (2005) argues that not being complaint with *Shari'ah* requirements may strongly affect the bank's liquidity, solvency, profitability, and market position. Ginena (2014) argues that IBs may be exposed to a veaious of issues such as higher cost of attracting depostir, withdrwal of fund, financial loss, liqudity risk, bank failures, and financial instability if they are being not compliant with *Shari'ah* principles.

Although IBs operate in a competitive environment with their conventional counterparts, it is evident that the difference between them is apparent in the area of risks because of unique financial characteristics of IBs and *Shari'ah* compliance related to these banks. Notably, by comparing both types of banks, it is pertinent to point out that the empirical literature findings on banks' risks are mixed (Safiullah and Shamsuddin, 2018). Čihák and Hesse (2010) and Beck et al. (2013) find that IBs face greater insolvency risk. Abedifar et al. (2013) report less credit risk in IBs while Kabir et al. (2015) show that IBs are at greater credit risk compared to their conventional counterparts. Abedifar et al. (2013) and Mollah et al. (2017a) find that IBs' insolvency risk does not differ from that of CBs. More recently, Safiullah and Shamsuddin (2018) find that IBs exhibit lower credit risk, lower insolvency risk, higher liquidity risk, but similar operational risk relative to their conventional counterparts. Furthermore, El Alaoui et al. (2016) find that Shri'ah compliant stock have lower market risk than Conventional stock. Notably, the majority of previous banking literature concentrates on credit and insolvency risks and whereas other risks (market and operational risks) only received little attention (Abdullah et al. 2011; Hassan and Aliyu, 2018).

As discussed previously, IBs have different characteristics, driven by their compliance with *Shari'ah* principles. Therefore, risk governance mechanisms (e.g. RC and CRO) in IBs have an additional responsibility to ensure that their activities are compliant with *Shari'ah* principles. This might add more constraints (e.g. not using hedging) on their ability to manage risk leading to different effects on risk-taking actions. This different system provides room for further investigation into the RC's roles concerning risk-taking strategies. The following hypothesis, thus, is proposed:

H1b: There is a significant difference in the influence of risk governance on risk-taking between Islamic and Conventional banks.

4.2.3 Risk governance and risk management effectiveness

It is noteworthy that levels of risk-taking do not impact a firm's risk management effectiveness unless financial performance is considered. The fact that a firm undertakes a low-risk strategy does not necessarily indicate that it exhibits good practice. According to the risk-return trade-off, effective risk management means that risk-taking should be positively related to a firm's financial performance. In other words, under effective risk management, higher risks should only be accepted for higher returns (higher financial outcomes). In the previous section, our study focused on the influences of risk governance on banks' risk-taking. Extending the topic further, we attempt to understand whether the existence of advanced risk governance mechanisms (i.e., the appointment of a CRO and the existence of a board RC) improves the effectiveness of a bank's risk management. As risk governance mechanisms (i.e., the RC and the CRO) are responsible for overseeing the risk assessment and risk management of firms, their presence could affect the management's risk-taking decisions. Based on the option theory, the management of a bank may form the intention of taking on a risky project in order to be compliant with the shareholders' interests but may not have considered the project's possible returns. Therefore, the management might end up taking some high-risk, low-return investments. On the other hand, it is also possible that management becomes excessively conservative in their risk-taking due to the board of directors being more assertive in regard to limiting risk. Directors (especially independent directors[34]) have increased their concern about damaging their reputations or jeopardising their positions as regulators have increased the pressure that they place on the board of directors to enhance risk oversight (Sun and Liu, 2014). Such over-conservative risk-taking positions by management under BOD monitoring pressure, i.e. refusing an investment that yields marginal increases in returns for a less marked marginal increase in risk, also indicates ineffective risk management. However, as we have discussed, risk governance mechanisms which include a dedicated Risk Committee and/or the appointment of a fully-responsible Chief Risk Officer might reduce the management's motivation to make risky decisions and hence, might prevent irrational risky decisions. Therefore, we expect that more effective risk governance would improve risk management effectiveness.

Nevertheless, as has been discussed, IBs have different operational systems, different sources of funding, and different governance structures. Islamic banks must fully comply with shari'ah principles in order to be able to keep the majority of their clients (i.e. religious clients

[34] Outside directors are more likely to be more concerned with losses related to reputation more than money that caused by lawsuits as a result to the small risk derived from directors' out-of-pocket liability (Black et al.,2006).

– investment account holders). Despite their major stake, these clients are still under-protected by the board as the focus is on the interests of shareholders. Hence, such banks might end up adopting high risk-taking strategies and causing other stakeholders (i.e. IAHs) to bear the risks. It should be noted that religious clients tend to be highly risk-averse (Hilary and Hui, 2009). Therefore, the risk governance mechanisms within IBs should specifically consider this major client group by overseeing and mitigating the risks that such banks undertake. However, as risk governance mechanisms in IBs are already subject to many restrictions on risky investment choices which result from Shari'ah' compliance, management may well experience more pressures (than their CB counterparts) to make less risky decisions and forgo high-risk high-return investments. For this reason, we expect that risk governance mechanisms in Islamic banks may not effectively influence the risk management (the positive relationship between risk-taking and performance). Based on the previous arguments, we set our hypotheses as follows:

H2a: Risk governance mechanisms are significantly positively associated with the relationship between risk-taking and a firm's performance.
H2b: There is a significant difference in the moderating effect of risk governance on the relationship between risk-taking and a firm's performance across the two bank types.

4.3 Research design and data

4.3.1 Sample

The initial sample of this study consists of 360 banks: 94 Islamic banks (IBs) and 266 conventional banks (CBs) operating in 22 MENA countries for the period 2009 to 2015.[35] The investigation is conducted during this period for several reasons. First, the selection of the sample period allows the study to avoid potential effects of the exogenous macroeconomic shock that banks experienced during the financial crisis of 2007-2008. This may distort the effects of corporate governance obtained. Second, corporate governance mechanisms (e.g., board of directors and its committees) have received significant reforms after the recent financial crisis. Furthermore, IBs experience a peaked flourish, which dramatically increased the global awareness towards IBs during this period. All the banks in our sample require to have a full annual reports, published as the financial year ends on the 31st of December. We also filtered the sample following three criteria that were used in the previous literature e.g. (Abedifar et al., 2013; Beck et al., 2013; Abdelsalam et al., 2016; Mollah et al., 2017a): (1)

[35] The majority of IBs are based in the Middle East & North Africa (MENA) region as Islam is the dominant religion (Ernst and Young, 2012; Abdelsalam et al., 2016)

both types of banks need to be currently operating in each country; (2) banks in the sample need to be fully-fledged commercial banks. Therefore, CBs with Islamic windows and full investment banks were erased from the sample[36]; (3) banks also need to be commercial, listed, and have more than two consecutive years of data. The final sample contains 65 listed banks. Table 4.1 presents the sample distribution by bank and country, with 188 observations for IBs and 252 observations for CBs. Bahrain and Kuwait have the highest proportions of IBs, while the highest proportion of CBs is concentrated in Jordan.

Country	Observations (IBs)	Observations (CBs)	Observations (Full Sample)	IBs Percentage	CBs Percentage	Full Sample Percentage
Bahrain	35	14	49	18.62%	5.56%	11.14%
Egypt	14	21	35	7.45%	8.33%	7.95%
Jordan	14	70	84	7.45%	27.78%	19.09%
Kuwait	35	28	63	18.62%	11.11%	14.32%
Lebanon	0	28	28	0.00%	11.11%	6.36%
Oman	6	21	27	3.19%	8.33%	6.14%
Palestine	14	7	21	7.45%	2.78%	4.77%
Qatar	21	35	56	11.17%	13.89%	12.73%
Saudi	28	0	28	14.89%	0.00%	6.36%
Tunisia	0	14	14	0.00%	5.56%	3.18%
UAE	21	14	35	11.17%	5.56%	7.95%
TOTAL	**188**	**252**	**440**	**43.00%**	**57.00%**	**100.00%**
Number of Banks	28	37	65			

Notes: The final sample employs an unbalanced panel data of 65 listed banks (440 bank year-observations),

Table 4.1 Sample distribution

The consolidated financial data (in US dollars) were obtained from the BankScope and Bloomberg databases. Market risk data were collected from the Datastream database. The governance-level data were manually collected from the banks' annual reports that are available on their official websites. The country-level variables (macroeconomic and governance indicators) were retrieved from the World Bank website.

[36] CBs with Islamic windows are banks providing products compliant with *Shari'ah* (Beck et al., 2013). CBs with Islamic windows were excluded, as there is no separate financial data for these banks that allow us to distinguish them from the full CBs (e.g., Cihak & Hesse, 2010).

4.3.2 Measures

4.3.2.1 Risk-taking measures

Some of the previous literature considers only market risk as a measure of risk-taking (i.e. Pathon, 2009; Ellul and Yerramilli, 2013; Sun and Liu 2014). Abedifar et al. (2013) consider insolvency, credit, and interest rate risks when measuring bank risk-taking. Nevertheless, no studies have considered five different perspectives of measuring risk-taking and its association with risk governance functions. Thus, we measure risk-taking by considering five different perspectives of risk. These are: market risk, credit risk, operational risk, liquidity risk, and insolvency risk (see Appendix 2 for variables definitions). We also measure risk-taking by calculating one single index to represent the overall risk-taking of the bank. The overall risk index is gained by calculating the factor analysis eigenvalue obtained from the five risks perspectives mentioned above.[37]

Following previous literature on bank market risk (Anderson and Fraser, 2000; Chen et al., 2006; Pathan, 2009; Sun and Liu, 2014), we measure market risk by total risk *(TR)*. Total risk reflects the total stock return volatility. Pathan (2009) states that regulators and firm executives usually observe the total risk as it provides a full picture of the riskiness of assets, liabilities, and off-balance sheet positions. Following previous studies (Jin, 2002; Armstrong and Vashishtha, 2012; Vieito and Khan, 2012; Baixauli-Soler et al., 2015), we measure the total risk as the standard deviation of monthly stock returns, based on 60 months' consecutive returns with a minimum number of 36 months.[38] We use return index data type RI to measure the banks' monthly returns.[39] In line with Soares and Stark (2009), we calculate the banks' monthly stock returns using the following equation.

$$r_{itj} = \frac{RI_{itj}}{RI_{itj-1}} - 1 \qquad (1)$$

Where r_{itj} is the monthly stock return of bank i at month t, in country j, RI_{itj} is the return index for bank i at month t in country j, and RI_{itj-1} is the previous month's return index for bank i in country j. For robustness check purposes, we also measure the market risk using idiosyncratic risk *(IDR)*. Following (Anderson and Fraser, 2000; Chen et al., 2006; Pathan,

[37] Yeh (1996) used factor analysis to produce 4 strong factors that are based on 12 financial ratios.

[38] Alford and Boatsman (1995) report that adopting monthly stock return over a five-year period is more accurate for estimating the volatility.

[39] The RI type data is obtained from the DataStream database, which defined it as the theoretical growth in value of shareholders over a specified period. In calculating the RI, the dividend is assumed to be re-invested to purchase additional unite of equity or unit trust at the closing price.

2009; Sun and Liu, 2014), we measure *IDR* by taking the natural logarithm of the standard deviation of the residual of the following equation[40]:

$$R_{itj} = a_i + \beta_{1ij} R_{mtj} + \beta_{2ij} INTEREST_{tj} + \varepsilon_{itj} \quad (2)$$

Where R_{itj} is the stock return for the bank i at month t in country j, R_{mtj} is the market return of country j at month t. INTEREST is the yield on the three-month Treasury-bill rate. Stock and market returns are measured by calculating the natural logarithm of monthly stock return R_{itj} = $In(P_{itj}/ P_{itj-1})$, where P_{itj} is the stock price.[41]

Our second perspective of risk-taking is the credit risk. Credit risk is related to bank loan quality. Following Abedifar et al. (2013), we measure the banks' credit risk *(IMPALOAN)* by calculating the impaired loan to the total loans. We also measure the credit risk by calculating the loan losses reserve to the gross loan (LLR) for robustness check purposes. Our next risk-taking perspective is the operational risk. Operational risk is inherent risk that is related to business risk activities. Thus, operating profit indicators are the most appropriate measure for banks' operational risk as risky activities may cause volatility in their income. Therefore, following (John et al., 2008; Sun and Chang, 2011), the standard deviation of the return on average assets (SDROAA) has been calculated. Furthermore, we estimated the standard deviation of the operating income to total assets (SDOI) as another robust operational risk measure.

Liquidity risk is one of the most important perspectives that banks need to manage accurately. This provides a clear picture of a bank's financial position as this risk perspective is monitored by a number of regulators (i.e. BSBC). We measure the liquidity risk by calculating the cash holding to the bank's total assets (CTA). Further to this measure, we also measure the liquidity risk using the liquid assets to total assets ratio (LA).

Another important risk aspect that provides an insight into the banks' financial strength is the insolvency risk. We measure the insolvency risk by estimating the inverse direction of the natural logarithm of Z-score value (InZscore1). The Z-score has an inverse relationship with the probability of banks' failure. When the asset value of the banks drops below their debt value, they become insolvent as a higher Z-score means a lower insolvency risk. Both interest

[40] We estimated this model for each year for each bank.
[41] We also consider the capital adjustment in the stock price including stock splits and dividends.

and fee-based income can be calculated by Z-score, which has been frequently utilised to capture banks' financial stabilities (Cihak and Hesse, 2010; Abedifar et al., 2013; Beck et al., 2013; Mollah et al., 2017a). Following previous literature (i.e., Abedifar et al., 2013; Beck et al., 2013; Cihak and Hesse, 2010; Mollah et al., 2017), we measure the Z-score as the expected return on assets $\mathrm{E(ROA)}_{it}$ plus the equity capital to total assets ratio $(\mathrm{CAR})_{it}$ divided by the standard deviation of return on assets $\sigma(\mathrm{ROA})_{it}$.[42] To have a more robust check, we also measure Z-score using a different formula (InZscore2). This is obtained by taking the inverse of the natural logarithm of the equity to total assets (CAR) to the standard deviation of return on average assets.

4.3.2.2 Accounting and market-based performance measures

When measuring the banks' performance, we use both accounting and market-based measures. The ratio of return on average assets (ROAA) and the ratio of return on average equity (ROAE) have been considered to reflect the accounting-based measures. The market-based measures include both Tobin's Q (TOBINQ), computed as the ratio of equity market value plus liability book value divided by asset book value, and the market value of equity to its book value (MTB).

4.3.2.3 Measures of explanatory variables

Our main explanatory variable for risk-taking models is the risk governance index (RGI). Following Ellul and Yerramilli (2013), we create an RGI to measure the risk governance function's strength and independence for each bank in each year. The risk committee (RC) and the Chief Risk Officer (CRO), the official exclusively responsible for managing the entire-price risk across all business segments of the bank, are considered when measuring our RGI. Therefore, we use two sets of variables to reflect each mechanism's characteristics. The first set of variables captures the risk oversight quality that is provided by the bank's RC. In this regard, we investigate five characteristics of banks' RCs: (1) RC size (RCSIZE), a dummy variable that identifies whether the bank's risk committee size is larger than the mean RC size of the country. (2) RC independence (RCIND), a dummy variable taking the value of 1 if the percentage of independent members on the RC is higher than the mean value of the RCIND of the country. (3) RC frequency meeting (RCMEETING), a dummy variable that takes the value of 1 if the bank's RC met more frequently during the year than the average of the RCMEETIMNG across all bank in the country. (4) RC multi-membership (RCMULTI), a

[42] We use the natural logarithm to capture Z-score to control for any high skewness and outliers of the distribution. We use three consecutive years (current + two previous year) to measure the standard deviation of ROA.

dummy variable that takes a value of 1 if the proportion of independent members of the RC who are also serving on another firm's board is higher than the mean value of the RCMULIT of the country. (5) Expert accounting and/or financial members of the RC (RCFINQ), a dummy variable that takes a value of 1 if the percentage of members who have financial or accounting experience and/or academic qualifications on the RC is higher than the average RCFINQ across all banks in the country. According to Forbes and Milliken (1999), the frequency of meetings, independency, and skills and knowledge are very important factors that determine how effective board members are in making decisions. Our next set of variables captures the importance of the CRO. In more detail, we construct the following variables: (CROPRESENT), a dummy variables that takes the value of 1 if the CRO (or an equivalent function) is responsible for the entire-price risk management in the bank;[43] (CROEXECUTIVE), a dummy variable that takes the value of 1 if the CRO is an executive officer in the bank; (CROMEMEBER), a dummy variable that identifies whether the CRO is a member of the RC; and (CROREPOERTOBOD), a dummy variable that identifies whether the CRO reports to the board of directors directly.

We measure the RGI by taking the first principal component of the following nine risk governance variables: *RCSIZE, RCIND, RCMEETING, RCMULTI, RCFINQ, CROPRESENT, CROEXECUTIVE, CROMEMEBER,* and *CROREPOERTOBOD*. Using principal components analysis, we can effectively perform a decomposition value of the correlation matrix of risk management characteristics (Ellul and Yerramilli, 2013). We take the eigenvector in the decomposition as our main single factor in this study. The main benefit of using principal components analysis for measuring risk governance mechanisms is that it avoids eliminating any characteristic subjectively, or subjectively judging the importance of these categories (Tetlock, 2007). Our second explanatory variable is the interaction variable between RGI and the Islamic bank dummy variable (RGI_IB). This allows us to measure the risk governance effectiveness in managing risk-taking in IBs.

For the performance model, we take the interaction between the risk governance index and the overall risk measure (RGI_OVERRISK) and (RGI_OVERRISK_IB) for Islamic banks as our main explanatory variables. As having high risk governance effectiveness leads to high

[43] In some of the banks in our sample, the chief credit officer or the risk general manager may be responsible for the risk management department. Thus, we allocate them the same coding as CRO in order to not miss out these alternative designations.

(low) risk management effectiveness, the coefficients on (RGI_OVERRISK) and (RGI_OVERRISK_IB) are expected to be positive (negative).

4.3.2.4 Controls

As mentioned before, we consider the number of risk perspectives to investigate the banks' risk-taking quality. We estimate five models for risk-taking, these are: market risk, credit risk, operation risk, liquidity risk and insolvency risk. We also take the overall risk of the five risks perspectives for greater robustness. For all our models, we control for a number of corporate governance variables. These are: board of directors size (BODSIZE), percentage of independent members of the board (BODIND), and CEO-Duality. Previous literature (Pathan, 2009; Abedifar et al., 2013; Sun and Liu, 2014; Mollah et al., 2017a) suggests that board composition and CEO-Duality might affect a firm's risk-taking. As the relationship between the board structure and risk-taking is not consistent across prior literature,[44] the signs on these variables are not assigned.

We also control for the ownership structure. We consider two important ownership characteristics in our analysis. These are INSTITOWN and MANGOWN. Laeven and Levine (2009) state that the analysis of risk-taking would be inefficient if the ownership structure were not included. Erkens et al. (2012) find that firms with higher institutional ownership (INSTITOWN), measured by the percentage of shares held by institutional firms to the total outstanding shares, had higher stock return volatility before the crisis. Therefore, we include the institution ownership for all our models except for the liquidity risk model. Insider ownership (MANGOWN), measured as the percentage of shares held by executive directors to the total outstanding shares, is included in our liquidity risk model as managers might be able to exploit the firm's financial reserves (i.e. cash).

Bank size and age play a crucial role in determining the firm's risk-taking level. Small firms are very likely to be more conservative due to their limited access to external funds. Also, large banks might take advantage of their too-big-to-fail reputation, which might give them more incentive to take more risks. Bank age (*AGE*) is measured by the difference between the sample year and the established year for the bank. We take the natural logarithm of the bank's total assets as a measure for bank size (*LOGTA*). Following previous studies (Saunders et al., 1990; Demsetz et al., 1997; Anderson and Fraser, 2000; Pathan, 2009; Ellul and Yerramilli,

[44] Pathan (2009) finds a negative relationship between BODSIZE and BODIND and risk-taking. Also, he found that CEO-Duality affects risk-taking negatively. Whereas, Sun and Liu (2014) find positive relationship between risk-taking and BODSIZE.

2013; Sun and Liu, 2014; Mollah et al., 2017a), we also control for bank's profitability (ROAA), deposit to assets ratio (Deposit), Tier 1 ratio (TIER1), equity to total assets (LEV), and income diversification (NONINT).[45] Myers and Majluf (1984) discuss that some firms may maintain conservative risk strategies to support investment, thus we include Tobin's Q to control for banks' growth opportunities (*GROWTHOPP*). However, banks also might take higher risk if they have higher investment opportunities. We expect to have a positive impact of growth opportunity on our risk measures. Also, loan to total assets ratio (LOANTA) and loan growth might have an effect on the banks' loan quality since a high credit-accepting policy might be an indicator of weak loan investigations (Abedifar et al., 2013). Thus we control for LOANTA and LOANGROWTH for our credit risk model. We also include an *ISLAMIC* bank dummy variable.

Furthermore, country-specific variables are included to control for economy and growth differences. These are: (a) the annual GDP growth rate (*GDPGROWTH*), (b) the Herfindahl-Hirschman Index (*HHI*) concentration ratio, (c) the domestic interest rate (DIR), (d) the legal system (*LEGAL*), and (e) the country governance quality (G-Index).[46] We also control for years and countries' dummy effects.

4.3.3 Estimation models

Panel data analysis is the adopted approach in this study to control for constant and unobservable heterogeneity (Andres and Vallelado, 2008). To control for heteroskedasticity, we apply Pooled Ordinary Least Squares (OLS) with robust standard error. We run regression for our models using different classifications of control variables, including bank-specific variables, country-specific variables interchanged with country dummies, and year dummies. This step assures the sensitivities of our results. For a further robustness check, we control for endogeneity problems. Thus, we re-estimate our models by utilising the Two Steps System Generalized Methods of Moments (GMM). GMM can solve a number of endogeneity problems (i.e., reverse causality and omitted-variables bias). To test our hypotheses (H1 – H2), we use the following models (3) – (4):

For risk-taking, we use:

[45] We also control for trade frequency for our market risk model. The results are consistent with our main models. However, we did not include it in our main model due to the missing data issue.

[46] Kaufmann et al. (2009) produced the country governance index. G-Index can capture cross-country differences that might affect the bank's risk-taking (Cihak and Hesse, 2010). The G-index is measured by taking an average of the six governance indicators: voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law, and corruption control.

$$Risk\_Taking_{i,j,t} = a_0 + a_1 * ISLAMIC_{i,j,t} + b_1 RGI_{i,j,t} + b_2 RGI\_IB_{i,j,t} + \gamma * X_{i,j,t} + \delta * ME_{j,t} + \varepsilon_{i,j,t} \quad (3)$$

For bank performance, we use:

$$Performance_{i,j,t} = a_0 + a_1 * ISLAMIC_{i,j,t} + b_1 RGI_{i,j,t} + b_2 RGI\_IB_{i,j,t} + b_3 RGI\_OVERRISK_{i,j,t} + b_4 RGI\_OVERRISK\_IB_{i,j,t} + b_5 OVERRISK_{i,j,t} + OVERRISK\_IB_{i,j,t} + \gamma * X_{i,j,t} + \delta * ME_{j,t} + \varepsilon_{i,j,t} \quad (4)$$

where,

$Risk\_taking_{i,j,t}$ is the risk-taking of bank *i* in country *j* at time *t*,

$Performance_{i,j,t}$ is the performance of bank *i* in country *j* at time *t*,

$RGI_{i,j,t}$ is the Risk Governance index of bank *i* in country *j* at time *t*,

$OVERRISK_{i,j,t}$ is the overall risk-taking index of bank *i* in country *j* at time *t*,

$X_{i,j,t}$ is a matrix of bank-level control variables of bank *i* in country *j* at time *t*,

$ME_{j,t}$ is a matrix of country-level macroeconomic variables,

$\varepsilon_{i,j,t}$ is the error term; α_0 is the constant; and α, β, γ, and δ are the vectors of coefficient estimates.

4.4 Results and analysis

4.4.1 Descriptive statistics

The summary statistics for the main risk perspectives, risk governance variables, financial characteristics, governance characteristics, and country-level characteristics are presented in Table 4.2. We also report the mean value of all variables for each subsample of the banks, categorised by the bank type. The results suggest that IBs following higher risk strategies in TR, SDROAA, and CTA than CBs. In more detail, IBs' risk indicators are 0.1, 7.54, 0.98, 9.46, and 0.33 for TR, IMPLOAN, SDROAA, CTA, and INZSCORE1 respectively. In contrast, the CBs' risk indicators are 0.06, 8.89, 0.33, 11.46, and 0.26. However, the two-sample t-test shows significant differences between the two samples for only TR, SDROAA, CTA, and INZSCORE1. Furthermore, the OVERRISK confirms our previous results – that IBs are riskier than CBs, as the value for IBs is 0.194 compared to -0.18 for CBs. Figure 4.1shows the differences between IBs and CBs risk-taking, where it is obvious that CBs banks have lower risk level than IBs across the years in our sample. Moreover, the figure reveals that both CBs and IBs reduce their risk-taking level across the years of the study

sample. The full sample mean values of these risk indicators are 0.082, 8.325, 0.609, 10.64, 0.228, and -0.02 for TR, IMPLOAN, SDROAA, CTA, INZSCORE1, and OVERRISK respectively. The performance accounting-based measures ROAA (ROAE) show a mean value of 1.21(10.30) for the full sample, 0.85(7.57) for IBs, and 1.46(12.08) for CBs. Moreover, the performance market-based measures TOBINQ (MTB) show a mean value of 1.05 (1.43) for the full sample with no significant differences between IBs and CBs. However, CBs achieve higher accounting performance compared to IBs, whereas the IBs' market performance is higher than that of the CBs.

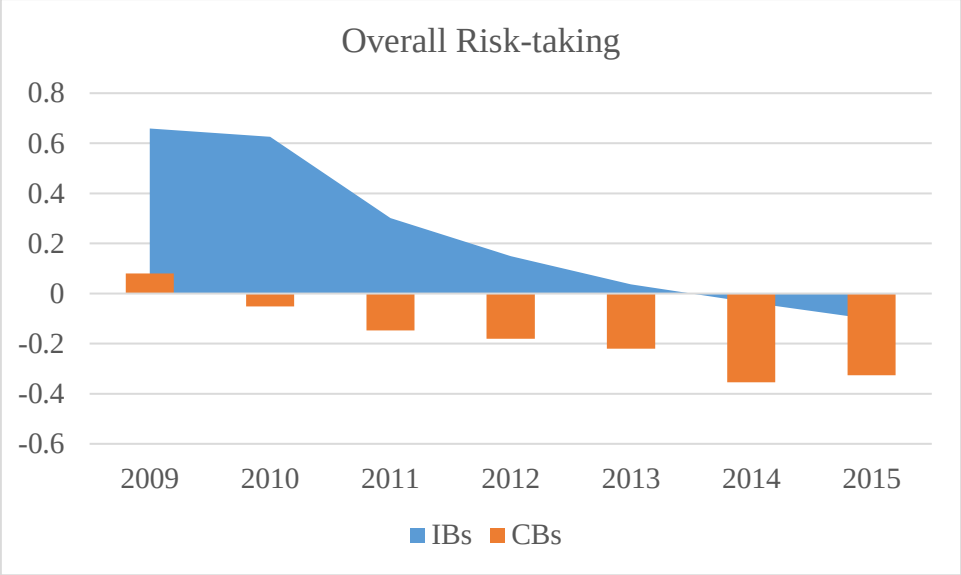

Figure 4.1 Distribution of overall risk-taking across years between IBs and CBs (OVERRISK mean)

The mean values of the RGI full sample are -0.012 and -0.136 (0.109) for IBs (CBs), which indicates that the low RGI index score for the full sample is derived from the IB subsample. The summary statistics results also suggest that the CBs are following a better approach in adopting a strong risk governance mechanism, compared to their counterparts. Investigating the components of RGI, we find that around 79% of banks in the final sample have a stand-alone board-level risk committee. However, there is no significant difference on the risk committee existing between IBs and CBs. Furthermore, only 45% of banks in our full sample have higher RC members than the average sample in each year. Interestingly, the T-tests show significant differences between IBs' and CBs' mean values for RCIND, RCMEETING, RCMULTI, and RCFINQ. While the IBs have mean values of 0.363, 0.433, 0.401, and 0.625 for RCIND, RCMEETING, RCMULTI, and RCFINQ respectively, the CBs' mean values for these RC characteristics are 0.471. 0.586, 0.303, and 0.335. The RCIND result shows that only 36% of IBs have a higher percentage of independent directors on the RC than the

average, whereas the percentage of CBs with such a percentage is 47%. The RCMEETING results show that CBs' RCs are more active than those of IBs, as their meeting frequency is higher. However, the overall results of the RC characteristics show that CBs have stronger risk governance mechanisms compare to IBs. Nevertheless, the full sample mean value of 0.346 on RCMULTI indicates that approximately 65.4% of the banks in our sample have a lower percentage of members with multi-directorships on the RC than the average of the full sample. Moving to another risk governance mechanism, the CRO, we find that on average 47.7% of banks in our sample assign a Chief Risk Officer (or equivalent) to be the body responsible for the entire risk management of the bank. However, the IBs' mean value of CROPRESENT (57%) is higher than that of CBs (44%). In contrast, CBs are more practical in assigning the CRO to be a member of the executive team, as the CROEXECUTIVE mean value of CBs is 75%, compared to 60.8% in IBs. Also, the results indicate that the percentage of CROs reporting directly to the BOD in CBs is higher than in IBs. The CROMEMEBER result shows that only 16% of banks' year observations in our full sample have a CRO who is also a member of the RC.

The summary statistics results also provide a full picture of our banks' samples by considering other governance and financial characteristics. The mean values of board size (BODSIZE) and board independence (BODIND) are 9 members and 44.6% for the full sample respectively. Only 41.6% of IBs have CEOs who also have the BOD chairman position, compared to CBs (47.6%). The mean value of the banks' size is 15.63 for the full sample. The t-test results for the banks' size (LOGTA) show that CBs are significantly larger than IBs in our sample.

Variables	Full Sample						IBs: Sample Mean	CBs: Sample Mean	Two-Sample *t*-test
	Obs	Mean	Median	SD	Min.	Max.			
Risk and Return Characteristics									
TR	423	0.082	0.075	0.045	0.000	0.282	0.100	0.068	-7.420***
IMPALOAN	329	8.325	4.920	13.67	0.090	81.980	7.540	8.890	0.884
SDROAA	430	0.609	0.291	0.885	0.022	4.469	0.982	0.339	-7.95***
CTA	370	10.64	9.129	6.750	1.281	29.378	9.640	11.466	2.608***
INZSCORE1	424	0.289	0.261	0.120	0.161	0.766	0.334	0.262	-2.531**
OVERRISK	318	-0.029	-0.223	0.570	-0.721	1.759	0.194	-0.181	-6.097***
ROAA	425	1.212	1.306	1.121	-2.757	3.218	0.856	1.466	5.73***
ROAE	425	10.30	10.849	7.244	-7.994	25.476	7.573	12.081	6.26***
TOBINQ	400	1.051	1.030	0.113	0.400	1.656	1.056	1.048	-0.748
MTB	416	1.435	1.235	0.775	0.174	6.687	1.489	1.393	-1.252
Characteristics of the Risk Governance Function									
RCE	394	0.796	1.000	0.402	0.000	1.000	0.762	0.820	1.405
RCSIZE	375	0.451	0.000	0.498	0.000	1.000	0.415	0.475	1.138
RCIND	341	0.425	0.000	0.495	0.000	1.000	0.363	0.471	2.01**
RCMEETING	329	0.517	1.000	0.500	0.000	1.000	0.433	0.586	2.79***
RCMULTI	350	0.346	0.000	0.476	0.000	1.000	0.401	0.303	-1.920*
RCFINQ	349	0.461	0.000	0.499	0.000	1.000	0.625	0.335	-5.611***
CROPRESENT	376	0.497	0.000	0.501	0.000	1.000	0.570	0.445	-2.401**
CROEXECUTIVE	377	0.692	1.000	0.462	0.000	1.000	0.608	0.751	2.97***
CROMEMEBER	376	0.160	0.000	0.367	0.000	1.000	0.198	0.131	-1.797*
CROREPOERTOBOD	376	0.101	0.000	0.302	0.000	1.000	0.057	0.131	2.36**
RGI	289	-0.012	0.319	1.624	-2.742	2.238	-0.136	0.109	1.291

Table 4.2 Descriptive statistics

Variables	Full Sample						IBs: Sample Mean	CBs: Sample Mean	Two-Sample *t*-test
	Obs	Mean	Median	SD	Min.	Max.			
Governance, Financial, and Country Characteristics									
BODSIZE	421	9.800	10.000	1.903	5.000	16.000	9.483	10.06	3.07***
BODIND	440	0.446	0.429	0.248	0.000	1.000	0.483	0.417	-2.75***
CEO-Duality	387	0.147	0.000	0.355	0.000	1.000	0.023	0.242	6.28***
INSTOWN	371	0.452	0.442	0.262	0.000	0.996	0.416	0.476	2.172**
MANOWN	421	0.040	0.000	0.089	0.000	0.399	0.046	0.035	-1.253
LOGTA	438	15.63	15.747	1.239	12.182	18.813	15.45	15.78	2.79***
AGE	419	33.76	36.000	16.86	1.000	85.000	24.22	40.81	11.3***
NONINT	396	0.305	0.282	0.141	0.074	0.726	0.271	0.329	4.18***
TIER1	412	17.91	15.300	7.976	9.660	46.780	20.78	15.73	-6.69***
LEV	425	14.28	12.577	6.741	6.856	42.757	16.527	12.687	-6.024***
DEPOTA	437	0.686	0.713	0.148	0.002	0.920	0.658	0.706	3.36***
LOANTA	366	0.590	0.601	0.156	0.261	0.884	0.572	0.605	2.032**
LOANGROW	365	12.022	9.310	17.226	-19.610	63.070	15.211	9.771	-3.00***
ISLAMIC	440	0.427	0.000	0.495	0.000	1.000	-	-	-
GDPGROWTH	440	4.026	3.096	4.422	-7.076	20.941	-	-	-
G-Index	440	-0.037	-0.078	0.451	-0.921	0.790	-	-	-
DIR	436	2.952	2.249	1.914	0.290	7.683	-	-	-
HHI	440	0.204	0.200	0.087	0.086	0.511	-	-	-
LEGAL	439	1.000	1.000	0.358	0.000	2.000	-	-	-

Notes: The table presents descriptive statistics of all variables used in all the regression models for the full sample. TR is total risk measured by the standard deviation of 60 monthly stock return consecutively with a minimum of 36 months to reflect the market risk. IMPILOAN is the impaired loan to total loans to measure the credit risk. SDROAA is the standard deviation of the return on average assets to measure the operational risk. CTA is the cash to total assets to measure the liquidity risk. InZscore1 is the invers of the logzscore to measure the insolvency risk. OVERRISK is factor analysis eigenvalue obtained from five risks measures mentioned before. ROAA is return on average assets. ROAE is return on average equity. TOBINQ is Equity MV plus liability BV divided by asset BV. MTB is market value to book value of equity. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. NONIT is non-interest income to total income. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. DEPOTA is total deposit to total assets. LOANTA is total loan total assets. LOANGROWTH is loan growth measured by the difference between current loan and the previous loan divided by previous loans. ISLAMIC is unity if the bank is Islamic, 0 otherwise. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. We also report on the paired sample mean test (*t*-test). *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$ (two-tailed test).

Table 4.2 *(Continued)*

Table 4.3 shows the different characteristics between banks with effective risk governance mechanisms (high RGI) and banks with no effective risk governance mechanisms (low RGI). We create a dummy variable for each bank that takes the value of 1 if the bank's RGI is greater than the median value of the RGI across all the banks during the year, otherwise it takes a value of 0. We then run a comparison test of the mean value of various banks' characteristics between the subsample, grouped by high RGI = 1 and low RGI = 0. We also report the two-sample t-test to know whether the differences between these two subsamples are significant or not.

The results in Table 4.3 suggest that banks with high RGI have less market, operational, and liquidity risks. Moreover, the overall risks indicator for banks with high RGI is -0.143 compared to 0.05 for banks with low RGI. This difference is significant at 1% level. However, this is consistent with our hypothesis that stronger risk governance mechanisms are expected to be more effective in managing the banks' risk activities. The performance accounting measures (i.e. ROAA and ROAE) show no significant differences between banks with high and low RGI. In contrast, performance market measures (i.e. TOBINQ and MTB) indicate that banks with high RGI achieve lower market performance compared to banks with low RGI. Whereas banks with high RGI have a mean value of 1.34 (1.033) for TOBINQ (MTB), banks with low RGI have values of 1.69 (1.087) for the same period. These differences are significant at 1% level. These differences between the two groups might be because of the weak risk managing function that banks with low RGI have, which gives management the opportunity to take higher risks, thus achieving higher returns.

The BODIND is significantly higher for banks with high RGI (50%) than for banks with low RGI (42.5%). Consistent with Ellul and Yerramilli (2013), we find that banks with high RGI have significantly lower Tier1 and higher LOANTA, as banks with high RGI have a mean value of 17.33 for Tier1 and 61.3% for LOANTA, compared to 20.22 and 57% for banks with low RGI. However, this is consistent with the hedging channel view as banks open to higher risk should embrace more effective risk management functions (Ellul and Yerramilli, 2013). Furthermore, although the Islamic variable is not significantly different between banks with high RGI and low RGI, we find only 46% of banks with high RGI are Islamic. This might indicate that larger and older banks usually adopt more advanced risk governance mechanisms, and most of these are CBs rather than IBs.

	Full Sample		
Variables	**High RGI**	**Low RGI**	**Two-Sample *t*-test**
TR	0.081	0.09	2.069**
IMPALOAN	6.886	5.205	-1.53
SDROAA	0.58	0.774	1.709*
CTA	11.37	8.803	-3.200***
INZSCORE1	0.294	0.285	-2.24
OVERRISK	-0.143	0.05	2.717***
ROAA	10.094	10.055	-0.0435
ROAE	1.266	1.263	-0.02
TOBINQ	1.347	1.691	3.651***
MTB	1.0336	1.087	3.728***
BODSIZE	9.662	9.978	1.451
BODIND	0.500	0.425	-2.439**
CEO-Duality	0.101	0.067	-1.025
INSTOWN	0.466	0.406	-1.921
MANOWN	0.007	0.009	-0.817
LOGTA	15.683	15.688	0.034
AGE	31.598	30.817	-0.396
NONINT	0.273	0.297	1.609
TIER1	17.333	20.22	2.987***
LEV	14.589	15.729	1.335
DEPOTA	0.657	0.685	1.558
LOANTA	0.613	0.571	-2.491**
LOANGROW	12.731	12.487	-0.113
ISLAMIC	0.466	0.524	0.993

Notes: The table presents comparison analysis of all variables used in all the regression models for the full sample of high and low RGI banks. TR is total risk measured by the standard deviation of 60 monthly stock return consecutively with a minimum of 36 months to reflect the market risk. IMPILOAN is the impaired loan to total loans to measure the credit risk. SDROAA is the standard deviation of the return on average assets to measure the operational risk. CTA is the cash to total assets to measure the liquidity risk. InZscore1 is the invers of the logzscore to measure the insolvency risk. OVERRISK is factor analysis eigenvalue obtained from five risks measures mentioned before. ROAA is return on average assets. ROAE is return on average equity. TOBINQ is Equity MV plus liability BV divided by asset BV. MTB is market value to book value of equity. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics (see appendix A for CR and CRO characteristics definitions). AVERC is the average value of risk committee characteristics. AVECRO is the average value of CRO characteristics. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. NONIT is non-interest income to total incomeTIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. DEPOTA is total deposit to total assets. LOANTA is total loan total assets. LOANGROWTH is loan growth measured by the difference between current loan and the previous loan divided by previous loans. ISLAMIC is unity if the bank is Islamic, 0 otherwise. We also report on the paired sample mean test (*t*-test). *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$ (two-tailed test).

Table 4.3 Univariate comparison of High vs. Low RGI of banks

Table 4.4 reports the Pearson pairwise correlation matrix for all our variables in the model to investigate any multicollinearity problems. However, the table reveals that there is no high degree of correlation between the key variables. The variance inflation factors (VIFs) also show no multicollinearity problems among the regressors.[47]

[47] There is no coefficient value higher than 80% between the explanatory variables, as the pairwise test shows. Also, there is no VIF value of each individual variable that has a value higher than 10.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
TR (1)	1													
IMPALOAN (2)	0.141*	1												
SDROAA (3)	0.247*	0.250*	1											
CTA (4)	-0.059	0.037	-0.181*	1										
INZSCORE1 (5)	0.261*	0.265*	0.860*	-0.173*	1									
OVERRISK (6)	0.497*	0.461*	0.819*	-0.297*	0.872*	1								
ROAA (7)	-0.071	-0.221*	-0.523*	-0.015	-0.469*	-0.417*	1							
TOBINQ (8)	-0.051	-0.256*	0.003	-0.101*	-0.048	-0.094*	0.251*	1						
RGI (9)	-0.177*	0.109*	-0.113*	0.2115*	-0.094	-0.168*	-0.013	-0.270*	1					
BODSIZE (10)	-0.031	0.143*	-0.178*	0.265*	-0.227*	-0.143*	0.133*	-0.126*	-0.076	1				
BODIND (11)	0.129*	-0.022	0.211*	0.015	0.2117*	0.181*	-0.247*	0.043	0.057	-0.257*	1			
CEO-Duality (12)	-0.219*	0.108*	-0.094*	0.285*	-0.176*	-0.184*	0.058	-0.038	0.097	0.147*	-0.201*	1		
INSTOWN (13)	-0.295*	-0.104*	-0.142*	0.318*	-0.108*	-0.168*	-0.032	-0.116*	0.190*	0.144*	-0.234*	-0.085	1	
MANOWN (14)	0.087*	0.133*	0.054	0.066	0.060	0.053	-0.040	0.099*	-0.067	0.049	0.043	0.063	-0.275*	1
LOGTA (15)	-0.033	-0.276*	-0.272*	0.039	-0.188*	-0.256*	0.409*	0.307*	-0.045	-0.059	0.140*	0.119*	-0.162*	-0.175*
AGE (16)	-0.281*	-0.127*	-0.345*	0.339*	-0.271*	-0.363*	0.147*	-0.038	0.040	0.310*	-0.164*	0.353*	0.095*	-0.138*
NONINT (17)	0.085*	0.517*	0.091*	0.039	0.058	0.251*	-0.053	-0.157*	-0.098	0.308*	-0.173*	0.215*	-0.153*	0.144*
TIER1 (18)	-0.148*	-0.104*	0.247*	-0.124*	0.047	0.097*	-0.280*	-0.017	-0.187*	-0.050	0.056	-0.217*	0.080	0.030
LEV (19)	0.073	0.080	0.446*	-0.288*	0.189*	0.334*	-0.253*	-0.130*	-0.096	-0.188*	0.189*	-0.180*	-0.171*	0.086*
DEPOTA (20)	-0.141*	-0.215*	-0.460*	0.264*	-0.260*	-0.394*	0.356*	0.192*	-0.059	0.225*	-0.150*	0.248*	0.095*	0.067
LOANTA (21)	-0.110*	-0.265*	-0.127*	-0.117*	-0.023	-0.092	0.163*	0.243*	0.137*	-0.177*	0.264*	-0.320*	-0.202*	0.091*
LOANGROW (22)	-0.082	-0.162*	0.021	-0.154*	-0.007	-0.005	0.041	0.103*	-0.028	-0.046	0.000	0.036	0.000	-0.067
ISLAMIC (23)	0.340*	-0.049	0.359*	-0.134*	0.329*	0.324*	-0.268*	0.038	-0.076	-0.145*	0.130*	-0.305*	-0.112*	0.061
GDPGROWTH (24)	0.179*	-0.124*	-0.096*	-0.029	-0.103*	-0.051	0.234*	0.089*	0.022	-0.074	-0.154*	-0.003	-0.105*	0.002
G-Index (25)	0.230*	-0.080	0.141*	-0.262*	0.125*	0.133*	0.077	0.172*	0.141*	-0.333*	0.303*	-0.471*	-0.211*	-0.128*
DIR (26)	-0.194*	0.037	-0.233*	0.414*	-0.188*	-0.263*	0.150*	-0.104*	0.040	0.279*	-0.263*	0.473*	0.365*	-0.133*
HHI (27)	-0.138*	0.017	-0.087*	0.059	-0.125*	-0.158*	0.034	0.026	0.144*	-0.017	-0.181*	-0.119*	0.059	0.152*
LEGAL (28)	0.203*	-0.067	0.131*	-0.261*	0.133*	0.125*	0.078	0.240*	-0.186*	-0.085*	0.119*	-0.536*	-0.279*	0.325*

Table 4.4 Pearson pairwise correlation matrix: full sample

	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
LOGTA (15)	1													
AGE (16)	0.321*	1												
NONINT (17)	-0.054	0.031	1											
TIER1 (18)	-0.476*	-0.295*	-0.137*	1										
LEV (19)	-0.315*	-0.440*	-0.051	0.746*	1									
DEPOTA (20)	0.277*	0.290*	-0.017	-0.439*	-0.726*	1								
LOANTA (21)	0.306*	0.102*	-0.271*	-0.260*	-0.193*	0.204*	1							
LOANGROW (22)	-0.088*	-0.247*	-0.020	0.325*	0.225*	-0.008	-0.059	1						
ISLAMIC (23)	-0.132*	-0.486*	-0.206*	0.313*	0.281*	-0.159*	-0.105*	0.158*	1					
GDPGROWTH (24)	-0.024	-0.162*	-0.064	0.085*	0.152*	-0.077	-0.080	0.096*	0.011	1				
G-Index (25)	0.201*	-0.213*	-0.272*	0.038	0.230*	-0.305*	0.403*	-0.020	0.040	0.147*	1			
DIR (26)	0.047	0.354*	0.141*	-0.220*	-0.309*	0.368*	-0.1123*	-0.055	-0.362*	-0.085*	-0.478*	1		
HHI (27)	-0.447*	-0.047	-0.195*	0.179*	0.074	-0.150*	0.077	0.112*	-0.059	0.215*	0.039	-0.2418*	1	
LEGAL (28)	-0.024	-0.366*	-0.092*	0.171*	0.236*	-0.105*	0.296*	0.034	0.360*	0.031	0.146*	-0.4682*	0.048	1

Notes: The table presents pair-wise correlation between all variables used in all the regression models for the full sample. TR is total risk measured by the standard deviation of 60 monthly stock return consecutively with a minimum of 36 months to reflect the market risk. IMPILOAN is the impaired loan to total loans to measure the credit risk. SDROAA is the standard deviation of the return on average assets to measure the operational risk. CTA is the cash to total assets to measure the liquidity risk. InZscore1 is the invers of the logzscore to measure the insolvency risk. OVERRISK is factor analysis eigenvalue obtained from five risks measures mentioned before. ROAA is return on average assets. TOBINQ is Equity MV plus liability BV divided by asset BV. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. BLOCOWN is the block holder ownership measured by the % shares for owner how own 5% and above to total shares. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. NONIT is non-interest income to total income. EBIT is earning before interest and tax to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. DEPOTA is total deposit to total assets. LOANTA is total loan total assets. LOANGROWTH is loan growth measured by the difference between current loan and the previous loan divided by previous loans. COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law.. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$ (two-tailed test).

Table 4.4 (Continued)

4.4.2 Empirical Results

4.4.2.1 RGI and risk-taking

Tables 4.5- 4.9 show the results from regressing our five risk-taking perspectives on our RGI variables and other control variables. Column 1 in the tables shows the regression specification, including only the banks' financial and governance characteristics. The regression specification results in column 2 include the country fixed effect in addition to the variables that were included in column 1. Column 3 additionally includes the country characteristics and year fixed effect in our regression for more sensitivity tests. Columns 4 and 5 report more robustness checks for our main regression results, which will be discussed more in a later section. The standard errors are robust in all of our specifications to control for heterogeneity.

4.4.2.2 RGI and market risk

Table 4.5 shows the results from regressing market risk (TR) on our RGI variables and other control variables. The results of our estimations indicate that the coefficients on RGI in columns 1-3 are negative and statistically significant, demonstrating that banks with stronger risk governance mechanisms have lower total risk. Furthermore, our interaction variable RGI_IB is not significant, indicating that there is no moderating effect of IBs. This implies that the relationship between risk governance and risk-taking is relatively similar in both CBs and IBs, i.e. effective risk governance is associated with lower total risk.

In terms of the controlling variables' coefficients, we find that BODIND affects the total risk positively, which indicates that independent members of the board seek to maximise the shareholders' wealth by taking excessive risks. The results also show that bank size (LOGTA) has a negative and significant relationship with banks' market risk. This points out that larger banks have lower total risk, which is consistent with the concept that larger banks adopt a stronger risk management function that leads to a decrease in the banks' risk-taking. The negative sign of the Tier1 coefficient might indicate that banks with higher capital are more capable of absorbing financial shocks, leading to lower volatility in their stock returns. NONINT is positively correlated with banks' total risk. One important variable that has a strong positive and significant relationship with total risk is ISLAMIC, which indicates that IBs have a higher total risk than CBs. This might be a result of the obligation on IBs to be Shari'ah compliant. Country characteristic variables also show a significant effect on banks' total risk. We find that GDPGROWTH, G-Index

and DIR have a positive effect on banks' total risk, whereas HHI shows a negative effect on it.

	Baseline estimation			Robustness check	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**TR**	**TR**	**TR**	**Residual**	**GMM**
TR -lag					0.875***
					(0.079)
RGI	-0.007***	-0.007***	-0.004**	-0.242***	-0.004*
	(0.002)	(0.002)	(0.002)	(0.079)	(0.002)
RGI_IB	0.002	0.004	0.000	0.161*	0.005
	(0.003)	(0.003)	(0.003)	(0.093)	(0.003)
BODSIZE	0.000	0.002	0.000	-0.072	-0.002
	(0.002)	(0.002)	(0.002)	(0.050)	(0.002)
BODIND	0.012	0.045***	0.021**	0.810**	0.008
	(0.009)	(0.011)	(0.008)	(0.333)	(0.013)
CEO-Duality	0.005	-0.014	-0.006	-0.249	0.013
	(0.008)	(0.012)	(0.009)	(0.467)	(0.013)
INSTOWN	-0.015	-0.010	-0.010	-0.194	-0.006
	(0.012)	(0.011)	(0.011)	(0.415)	(0.018)
LOGTA	-0.007***	-0.014***	-0.007***	-0.098	-0.005
	(0.002)	(0.003)	(0.003)	(0.093)	(0.003)
AGE	0.001	0.001	0.001	-0.003	0.001
	(0.000)	(0.000)	(0.000)	(0.007)	(0.000)
ROAA	0.001	-0.002	0.000	0.203*	0.002
	(0.002)	(0.003)	(0.003)	(0.117)	(0.004)
DEPOTA	-0.043	-0.059	-0.072*	-2.069*	-0.016
	(0.038)	(0.047)	(0.038)	(1.143)	(0.027)
TIER1	-0.002***	-0.003***	-0.002***	-0.043*	0.000
	(0.001)	(0.001)	(0.001)	(0.023)	(0.001)
LEV	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.035)	(0.001)
NONINT	0.039*	0.036*	0.041*	-0.652	-0.025
	(0.021)	(0.021)	(0.021)	(0.709)	(0.024)
GROWTHOPP	-0.011	0.004	-0.001	-1.277	-0.005
	(0.025)	(0.026)	(0.023)	(1.197)	(0.021)
ISLAMIC	0.019***	0.016**	0.022***	0.281	-0.003
	(0.007)	(0.006)	(0.006)	(0.204)	(0.007)

Table 4.5 Regression results on banks' risk governance and banks' market risk

	Baseline estimation			Robustness check	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**TR**	**TR**	**TR**	**Resudial**	**GMM**
GDPGROWTH			0.001**	0.011	0.000
			(0.001)	(0.018)	(0.000)
G-Index			0.025**	-0.545*	-0.002
			(0.010)	(0.307)	(0.006)
DIR			0.008**	-0.021	-0.001
			(0.003)	(0.089)	(0.002)
HHI			-0.228***	-1.263	-0.043
			(0.049)	(1.690)	(0.032)
LEGAL			0.008	0.178	0.002
			(0.010)	(0.302)	(0.008)
Constant	0.255***	0.316***	0.282***	4.375*	0.132**
	(0.050)	(0.059)	(0.052)	(2.317)	(0.061)
YEAR EFFECTS	NO	NO	YES	YES	YES
COUNTRY EFFECTS	NO	YES	NO	NO	NO
Observations	225	225	225	197	208
R-squared	0.381	0.561	0.539	0.332	
AR (1) test (p-value)					0.001
AR (2) test (p-value)					0.416
Hansen test of over-identification (p-value)					0.725
Diff-in- Hansen test of exogeneity (p-value)					0.31

Notes: The table presents regression results for banks' risk governance index and market risk for all samples for the period 2009-2015. TR is total risk measured by the standard deviation of 60 monthly stock return consecutively with a minimum of 36 months to reflect the market risk. IDR is the idiosyncratic risk measured by the log of the residual of the market model. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. RGI_IB is the interaction between risk governance index and Islamic bank. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. ROAA is return on average assets. DEPOTA is total deposit to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. GROWTHOPP is Equity MV plus liability BV divided by asset BV. ISLAMIC is unity if the bank is Islamic, 0 otherwise. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 4.5 *(Continued)*

4.4.2.3 RGI and credit risk

Table 4.6 shows the results from the regression of credit risk (IMPALOAN) on our RGI variable and other controlling variables. Consistent with the market risk, we find that stronger risk governance mechanisms also mitigate the credit risk, as the coefficient of IMPALOAN is negative and statistically significant. However, the significantly positive coefficient of the interaction term RGI_IB indicates that the effect of risk governance on risk-taking may be different in the Islamic bank system. As the absolute value of the interaction is 1.948 compared with 1.793 for the risk governance variable (RGI), this implies that risk governance may have no effect on credit risk in IBs. The rationale for this finding is likely to be because IBs do not take interest on loans; instead they have a different operating system for providing their loans that is based on *Shari'ah* law. Therefore, risk governance mechanism in IBs may encounter difficulties in managing credit risk if they use the conventional risk management strategies. Hassan and Aliyu

(2018) argue that IBs need to have different risk management strategies that are compliant with *Shari'ah* principles.

In terms of other governance control variables, the BODSIZE negatively and significantly affects the banks' credit risks, showing that a smaller board is stronger in reducing the banks' credit risks. Consistent with the market risk, the fraction of independent members on the BOD affects the credit risk positively. INSTOWN has a positive effect on banks' credit risk, which supports findings from previous literature that institutional ownership supports risk-taking at banks. Also, bank size has a negative relationship with bank credit risk, whereas age shows a positive effect on bank credit risk. This indicates that banks reaching growth and the mature stages of their lifecycle take higher credit risks to increase their performance. The negative coefficients of Tier1 and DEPOSTTA indicate that higher capital adequacy and core deposits might lead to a decrease in credit risk. Furthermore, the positive coefficient of the LEV variable assures that higher debts would lead to a lower credit risk. This may be because assigning higher equity capital may encourage banks to take risky strategies in their lending policies. Consistent with our market risk analysis we find that NONINT and ISLAMIC affect the credit risk positively. Loans and loan growth are negatively associated with credit risk, which was also identified by Abedifer et al. (2013).

	Baseline estimation			Robustness check	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**IMPALOAN**	**IMPALOAN**	**IMPALOAN**	**LLR**	**GMM**
IMPALOAN_lag					0.332***
					(0.112)
RGI	-1.793***	-1.192**	-2.249***	-0.258*	-2.253***
	(0.496)	(0.483)	(0.582)	(0.144)	(0.750)
RGI_IB	1.948***	1.141	1.837**	0.101	1.995**
	(0.713)	(0.725)	(0.734)	(0.182)	(0.874)
BODSIZE	-1.136***	-1.361***	-1.174***	0.023	-0.843
	(0.375)	(0.422)	(0.385)	(0.099)	(0.546)
BODIND	6.183***	7.497***	7.421***	0.724	1.947
	(2.184)	(2.602)	(2.504)	(0.587)	(2.995)
CEO-Duality	5.010**	3.281	4.676	1.954***	1.91
	(2.367)	(3.997)	(3.231)	(0.558)	(2.262)
INSTOWN	4.726***	1.548	5.235***	1.430***	-6.29
	(1.624)	(1.499)	(1.647)	(0.531)	(4.356)
LOGTA	-3.244***	-1.170*	-3.675***	-0.722***	-5.122***
	(0.696)	(0.660)	(0.749)	(0.179)	(1.341)
AGE	0.176***	0.132***	0.171***	0.050***	0.106*
	(0.051)	(0.050)	(0.047)	(0.011)	(0.059)
ROAA	-0.436	-0.640	-0.682	-0.586***	0.458
	(0.667)	(0.645)	(0.730)	(0.221)	(0.489)
DEPOTA	-17.31**	-13.07	-15.78**	-6.864***	-27.20***
	(6.791)	(8.518)	(6.462)	(1.580)	(9.504)
TIER1	-0.796***	-0.743***	-0.861***	-0.118***	-0.435*
	(0.172)	(0.165)	(0.168)	(0.037)	(0.247)
LEV	0.731***	0.809***	0.809***	-0.0393	0.0208
	(0.242)	(0.246)	(0.243)	(0.053)	(0.333)
NONINT	17.85***	21.56***	20.46***	2.303	24.80**
	(6.721)	(8.188)	(6.479)	(1.424)	(11.200)
GROWTHOPP	0.546	4.225	4.663	0.98	9.857
	(3.511)	(4.177)	(4.653)	(1.464)	(9.522)
LOANTA	-10.32**	-10.00*	-11.30**	0.7	-5.106
	(4.132)	(5.103)	(4.451)	(1.288)	(6.006)

Table 4.6 Regression results on banks' risk governance and banks' credit risk

	Baseline estimation			Robustness check	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**IMPALOA**	**IMPALOA**	**IMPALOA**	**LLR**	**GMM**
LOANGROW	-0.047	-0.034	-0.051*	-0.02***	-0.039**
	(0.029)	(0.029)	(0.029)	(0.007)	(0.015)
ISLAMIC	5.195***	5.717***	5.339***	0.680**	3.191*
	(1.231)	(1.461)	(1.396)	(0.341)	(1.714)
GDPGROWTH			-0.169	-0.039	-0.148**
			(0.108)	(0.029)	(0.057)
G-Index			1.793	-0.036	3.386
			(1.890)	(0.664)	(3.283)
DIR			0.594	0.214	0.119
			(0.539)	(0.147)	(0.922)
HHI			0.446	-7.025	-21.15
			(12.720)	(4.252)	(19.940)
LEGAL			0.003	1.173	-2.638
			(2.118)	(0.740)	(2.799)
Constant	73.58***	38.41***	68.43***	17.28**	111.0**
	(11.980)	(13.220)	(12.070)	(3.525)	(34.620)
YEAR EFFECTS	NO	NO	YES	YES	YES
COUNTRY EFFECTS	NO	YES	NO	NO	NO
Observations	203	203	203	204	185
R-squared	0.692	0.739	0.727	0.649	
AR (1) test (p-value)					0.05
AR (2) test (p-value)					0.502
Hansen test of over-identification (p-					0.624
Diff-in- Hansen test of exogeneity (p-					0.393

Notes: The table presents regression results for banks' risk governance index and credit risk for all samples for the period 2009-2015. IMPILOAN is the impaired loan to total loans to measure the credit risk. LLR is loan losses reserve to gross loans. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. RGI_IB is the interaction between risk governance index and Islamic bank. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. ROAA is return on average assets. DEPOTA is total deposit to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. GROWTHOPP is Equity MV plus liability BV divided by asset BV. LOANTA is total loan total assets. LOANGROWTH is loan growth measured by the difference between current loan and the previous loan divided by previous loans. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 4.6 *(Continued)*

4.4.2.4 RGI and operational risk

Table 4.7 reports the results from regressing operational risk (SDROAA) on our RGI variable and other controlling variables. Consistent with the results found for market risk, significant negative RGI and non-significant RGI_IB imply that risk governance has the ability to mitigate the operational risks for both CBs and IBs. Furthermore, we find that BODSIZE affects SDROAA negatively, supporting the concept that larger board size is more effective in reducing banks' operational risks. Interestingly, the results in Table 4.7 show that the CEO-

Duality has a positive and significant relationship with SDROAA. This is consistent with the sign direction that was predicted in the previous literature, that a CEO who is also the chairman of the BOD can benefit from his power and take more risks at the banks (Minton et al., 2014). As with credit risk, we find that bank size (LOGTA) and (Tier1) affect the operational risk negatively, while NONINT is positively associated with the credit risk. We also find that ROAA is positively associated with the operational risk as higher returns should lower the operational risk. Lev also has the same effect on the operational risk. Furthermore, a high investment growth might encourage banks to take higher risks as the GROWTHOPP is positively associated with SDROAA. Notably, the coefficient of ISLAMIC has a positive and significant relationship with operational risk.

	Baseline estimation			**Robustness check**	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**SDROAA**	**SDROAA**	**SDROAA**	**SDOI**	**GMM**
SDROAA_lag					0.468***
					(0.078)
RGI	-0.124***	-0.100***	-0.100**	-0.100***	-0.101*
	(0.029)	(0.033)	(0.038)	(0.017)	(0.045)
RGI_IB	0.043	0.017	0.023	0.100***	0.134*
	(0.051)	(0.060)	(0.056)	(0.023)	(0.072)
BODSIZE	-0.118***	-0.103***	-0.108***	-0.0314***	-0.013
	(0.031)	(0.032)	(0.029)	(0.012)	(0.023)
BODIND	0.044	0.054	-0.009	0.029	0.134
	(0.150)	(0.194)	(0.170)	(0.066)	(0.341)
CEO-Duality	0.197**	0.287*	0.241	0.204*	0.697**
	(0.098)	(0.149)	(0.150)	(0.106)	(0.340)
INSTOWN	0.282	0.335*	0.260	0.033	0.258
	(0.181)	(0.191)	(0.178)	(0.071)	(0.293)
LOGTA	-0.288***	-0.280***	-0.290***	-0.039	-0.171***
	(0.048)	(0.059)	(0.058)	(0.027)	(0.061)
AGE	0.005	0.010*	0.006	-0.004**	0.003
	(0.004)	(0.004)	(0.004)	(0.002)	(0.006)
ROAA	-0.222***	-0.229***	-0.203***	-0.100***	-0.100
	(0.073)	(0.078)	(0.072)	(0.020)	(0.070)
DEPOTA	-0.136	-0.270	-0.069	-0.878***	-0.346
	(0.468)	(0.695)	(0.540)	(0.214)	(0.826)
TIER1	-0.040***	-0.040***	-0.040***	-0.007	-0.050***
	(0.010)	(0.011)	(0.010)	(0.005)	(0.012)
LEV	0.077***	0.075***	0.074***	0.026***	0.062***
	(0.016)	(0.019)	(0.016)	(0.008)	(0.017)
NONINT	1.146**	1.081*	1.045*	0.415**	-0.348
	(0.542)	(0.625)	(0.557)	(0.180)	(0.615)
GROWTHOPP	1.068**	1.458***	1.020**	-0.229	0.880*
	(0.436)	(0.478)	(0.473)	(0.215)	(0.440)
ISLAMIC	0.400***	0.470***	0.418***	0.138***	0.056
	(0.097)	(0.111)	(0.098)	(0.041)	(0.141)

Table 4.7 Regression results on banks' risk governance and banks' operation risk

	Baseline estimation			Robustness check	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**SDROAA**	**SDROAA**	**SDROAA**	**SDOI**	**GMM**
GDPGROWTH			0.010	0.002	0.0127*
			(0.011)	(0.004)	(0.007)
G-Index			0.031	-0.020	0.048
			(0.152)	(0.075)	(0.128)
DIR			-0.049	0.060***	-0.045
			(0.042)	(0.017)	(0.043)
HHI			-0.914	-0.956***	-0.154
			(0.745)	(0.354)	(0.755)
LEGAL			-0.170	0.480***	0.223
			(0.170)	(0.085)	(0.201)
Constant	4.385***	3.807***	4.994***	1.365***	2.014
	(0.874)	(1.060)	(1.076)	(0.420)	(1.222)
YEAR EFFECTS	NO	NO	YES	YES	YES
COUNTRY EFFECTS	NO	YES	NO	NO	NO
Observations	224	224	224	225	207
R-squared	0.618	0.64	0.643	0.772	
AR (1) test (p-value)					0.014
AR (2) test (p-value)					0.124
Hansen test of over-identification (p-value)					0.910
Diff-in- Hansen test of exogeneity (p-value)					0.635

Notes: The table presents regression results for banks' risk governance index and operational risk for all samples for the period 2009-2015. SDROAA is the standard deviation of the return on average assets to measure the operational risk. SDOI is the standard deviation of the operating income to total assets. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. RGI_IB is the interaction between risk governance index and Islamic bank. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. ROAA is return on average assets. DEPOTA is total deposit to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. GROWTHOPP is Equity MV plus liability BV divided by asset BV. ISLAMIC is unity if the bank is Islamic, 0 otherwise. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01

Table 4.7 *(Continued)*

4.4.2.5 RGI and liquidity risk

Table 4.8 shows the results from regressing the liquidity risk (CTA) on the RGI and other controlling variables. The results revealed in Table 4.8 show that the RGI affects the banks' liquidity risk (CTA) negatively and this effect stays relatively intact across the two bank types.[48] This is consistent with other risk aspects, market risk and operational risk. Consistent with other risk aspects, we find that the BODSIZE reduces the liquidity risk. Unlike other risk perspectives, we find that the coefficient of BODIND is positive and statistically significant. This indicates that the fraction of independent members on the board helps to increase the

[48] Our measure for liquidity risk is cash to total assets, thus the positive sign of RGI's coefficient means that risk governance mitigates the liquidity risk.

liquidity in the banks (decrease the liquidity risk). Similar to operational risk, we find that CEO-Duality affects the liquidity risk positively. Importantly, the percentage of shares held by directors increases the liquidity at banks. This might be explained by the interests of directors, as they would pay more attention and engage in stronger monitoring if they own a higher percentage of shares in the bank. Similar to the other risk perspective, we find that LOGTA and Tier1 negatively affect the liquidity risk. The LEV coefficient shows a negative relationship with liquidity. That means that higher debt leads to a lower liquidity risk. Regarding the country characteristic variables, we find a positive relationship with liquidity for DIR only.

	Baseline estimation			**Robustness check**	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**CTA**	**CTA**	**CTA**	**LA**	**GMM**
CTA lag					0.659***
					(0.092)
RGI	1.222**	0.792**	1.007**	0.010*	1.316**
	(0.537)	(0.385)	(0.413)	(0.005)	(0.497)
RGI IB	-0.404	-0.134	-0.173	-0.003	-0.986
	(0.645)	(0.531)	(0.541)	(0.008)	(0.669)
BODSIZE	0.907***	0.666**	0.671**	0.011***	0.754**
	(0.301)	(0.259)	(0.262)	(0.003)	(0.370)
BODIND	2.183	3.983***	3.633***	-0.010	4.455*
	(1.443)	(1.277)	(1.371)	(0.020)	(2.273)
CEO-Duality	0.344	-7.532***	-7.713***	-0.028	-5.691
	(1.816)	(2.847)	(2.844)	(0.029)	(3.499)
MANOWN	3.498	17.18***	17.82***	0.0958	3.293
	(4.874)	(5.706)	(5.861)	(0.076)	(6.378)
LOGTA	-0.067	0.844	1.139*	-0.006	0.041
	(0.538)	(0.522)	(0.635)	(0.008)	(0.521)
AGE	0.010	-0.001	-0.011	-0.001	0.020
	(0.041)	(0.036)	(0.036)	(0.000)	(0.046)
ROAA	0.046	-0.699	-0.470	0.001	-0.408
	(0.534)	(0.544)	(0.521)	(0.009)	(0.516)
DEPOTA	5.196	4.357	4.264	0.040	-12.750
	(5.041)	(5.497)	(5.255)	(0.079)	(8.376)
TIER1	0.266*	0.254**	0.282**	0.001	-0.073
	(0.145)	(0.117)	(0.117)	(0.001)	(0.218)
LEV	-0.527***	-0.368**	-0.387**	-0.003*	-0.067
	(0.198)	(0.176)	(0.177)	(0.002)	(0.283)
NONINT	3.568	6.439**	6.479**	-0.003	3.559
	(3.260)	(3.127)	(3.108)	(0.048)	(9.657)
GROWTHOPP	-6.086	-5.822	-8.189	-0.052	5.728
	(5.948)	(4.250)	(4.988)	(0.070)	(5.873)
ISLAMIC	0.543	1.234	1.307	0.007	1.204
	(1.132)	(1.061)	(1.068)	(0.015)	(0.944)

Table 4.8 Regression results on banks' risk governance and banks' liquidity risk

	Baseline estimation			Robustness check	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**CTA**	**CTA**	**CTA**	**LA**	**GMM**
GDPGROWTH		0.021	0.001	0.001	0.035
		(0.106)	(0.115)	(0.001)	(0.068)
G-Index		-0.130	-1.170	0.015	2.770*
		(1.674)	(1.985)	(0.021)	(1.600)
DIR		2.586***	2.350***	0.015**	1.831***
		(0.421)	(0.511)	(0.007)	(0.586)
HHI		-8.364	-6.372	-0.244*	-31.36***
		(11.410)	(12.320)	(0.132)	(4.448)
LEGAL		-2.266	-2.950	0.003	1.671
		(1.852)	(1.945)	(0.021)	(1.907)
Constant	7.91	-11.15	-11.9	0.322**	-3.369
	(9.637)	(10.320)	(10.660)	(0.139)	(11.730)
YEAR EFFECTS	NO	NO	YES	YES	YES
COUNTRY EFFECTS	NO	YES	NO	NO	NO
Observations	223	223	223	240	200
R-squared	0.35	0.473	0.494	0.31	
AR (1) test (p-value)					0.001
AR (2) test (p-value)					0.131
Hansen test of over-identification (p-value)					0.631
Diff-in- Hansen test of					0.373

Notes: The table presents regression results for banks' risk governance index and liquidity risk for all samples for the period 2009-2015. CTA is the cash to total assets to measure the liquidity risk. LA is the liquid assets to total assets. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. RGI_IB is the interaction between risk governance index and Islamic bank. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. ROAA is return on average assets. DEPOTA is total deposit to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. GROWTHOPP is Equity MV plus liability BV divided by asset BV. ISLAMIC is unity if the bank is Islamic, 0 otherwise. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 4.8 *(Continued)*

4.4.2.6 RGI and insolvency risk

Table 4.9 presents the results from regressing the insolvency risk (InZscore1) on the RGI and other controlling variables. Just like other risk perspectives (i.e. market risk, operational risk and liquidity risk), we find a negative and significant relationship between RGI and banks' insolvency risk for both CBs and IBs. This supports our first hypothesis, that risk governance mechanisms mitigate all bank risk perspective, and our second hypothesis that such an effect remains across both banking systems. Furthermore, BODSIZE has a negative relationship with bank insolvency risk, confirming the results of our previous tables (5-7) that a larger board size is more effective in mitigating risks. We also find that bank size affects the insolvency risk negatively, which is consistent with the concept that larger banks usually

adopt a more effective risk governance function due to the high risks that they are involved in. The coefficient of age shows a positive and significant relationship with banks' insolvency risk, which is consistent with other risk perspectives – banks in their growth stages take on more risks. This can be confirmed by looking at the banks' investment opportunities, where we find that GROWTHOPP is positively and significantly associated with banks' insolvency risk. This indicates that banks with high investment opportunities have higher insolvency risks. As we discussed before, banks in their growth stages would have higher investment opportunities, leading them to increase their risk-taking. Just consistent with other risk aspects, we find a negative association with insolvency risk for ROAA and Tier, while NONINT and LEV affect the insolvency risk positively. Lastly, ISLAMIC is positively associated with insolvency risk, confirming that IBs have higher insolvency risks. We also find that stronger country governance affects insolvency risk positively.

	Baseline estimation			**Robustness check**	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**lnZscore1**	**lnZscore1**	**lnZscore1**	**lnZscore2**	**GMM**
lnZscore1_lag					-0.145*
					(0.074)
RGI	-0.029***	-0.027**	-0.029***	-0.028**	-0.041**
	(0.009)	(0.011)	(0.011)	(0.011)	(0.020)
RGI_IB	0.007	0.001	0.005	0.014	0.033
	(0.019)	(0.022)	(0.021)	(0.015)	(0.026)
BODSIZE	-0.036***	-0.034***	-0.033***	-0.027***	-0.018
	(0.011)	(0.012)	(0.010)	(0.007)	(0.014)
BODIND	0.010	0.025	0.020	0.048	-0.008
	(0.046)	(0.046)	(0.053)	(0.036)	(0.048)
CEO-Duality	0.071	0.140	0.138*	0.125	0.057
	(0.055)	(0.087)	(0.081)	(0.079)	(0.066)
INSTOWN	0.033	0.073	0.064	0.081**	0.068
	(0.045)	(0.053)	(0.047)	(0.039)	(0.058)
LOGTA	-0.068***	-0.063***	-0.076***	-0.074***	-0.068***
	(0.015)	(0.017)	(0.018)	(0.018)	(0.021)
AGE	0.002**	0.003***	0.002***	0.002**	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
ROAA	-0.070**	-0.081**	-0.079**	-0.035***	-0.047**
	(0.029)	(0.032)	(0.031)	(0.013)	(0.023)
DEPOTA	-0.067	-0.104	-0.030	-0.124	-0.263
	(0.148)	(0.202)	(0.158)	(0.137)	(0.230)
TIER1	-0.011***	-0.010***	-0.011***	-0.011***	-0.023***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.006)
LEV	0.011***	0.010***	0.010***	0.010***	0.015**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)
NONINT	0.206*	0.242*	0.261**	0.307***	0.009
	(0.122)	(0.127)	(0.125)	(0.115)	(0.197)
GROWTHOPP	0.331***	0.408***	0.349***	0.260**	0.263**
	(0.119)	(0.128)	(0.124)	(0.103)	(0.104)
ISLAMIC	0.103***	0.129***	0.109***	0.106***	0.077
	(0.026)	(0.031)	(0.026)	(0.024)	(0.053)

Table 4.9 Regression results on banks' risk governance and banks' insolvency risk

	Baseline estimation			Robustness check	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	**InZscore1**	**InZscore1**	**InZscore1**	**InZscore2**	**GMM**
GDPGROWTH			0.003	0.001	0.004
			(0.003)	(0.002)	(0.003)
G-Index			0.087**	0.065	-0.022
			(0.044)	(0.041)	(0.053)
DIR			-0.003	0.000	-0.012
			(0.009)	(0.008)	(0.012)
HHI			-0.163	-0.182	-0.413
			(0.182)	(0.171)	(0.366)
LEGAL			0.023	0.031	0.005
			(0.043)	(0.038)	(0.056)
Constant	1.395***	1.195***	1.377***	1.389***	1.724***
	(0.301)	(0.294)	(0.280)	(0.258)	(0.425)
YEAR EFFECTS	NO	NO	YES	YES	YES
COUNTRY EFFECTS	NO	YES	NO	NO	NO
Observations	223	223	223	224	203
R-squared	0.531	0.566	0.56	0.591	
AR (1) test (p-value)					0.000
AR (2) test (p-value)					0.975
Hansen test of over-identification (p-value)					0.442
Diff-in- Hansen test of					0.579

Notes: The table presents regression results for banks' risk governance index and insolvency risk for all samples for the period 2009-2015. InZscore1 is the invers of the logzscore to measure the insolvency risk. Zscore is measured by taking equity to total assets plus ROAA divided by SDROAA. InZscore2 is invers of another measure of Zscore using the equity to total assets divided by SDROAA. SDROAA is the standard deviation of the return on average assets. RGI_IB is the interaction between risk governance index and Islamic bank. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. ROAA is return on average assets. DEPOTA is total deposit to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. GROWTHOPP is Equity MV plus liability BV divided by asset BV. ISLAMIC is unity if the bank is Islamic, 0 otherwise. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 4.9 *(Continued)*

4.4.2.7 Risk governance mechanism (RGI) and risk management effectiveness

Table 4.10 reports the results on the moderating effects of risk governance mechanisms on the relationship between banks' performance and overall risk-taking. We control for governance, financial and country characteristics across all our specification models. We also control for year fixed effects for all our performance specification models. Columns 1-2 show the results after regressing the performance accounting measures on the interaction variables (RGI_OVERRISK and RGI_OVERRISK _IB). Columns 3-4 show the performance regression using market-based measures (TOBINQ and MTB). The standard errors are robust in all of our specifications to control for heterogeneity.

In detail, this moderating effect provides an indication of whether risk governance mechanisms can improve the effectiveness of banks' risk management. There are four main variables in this investigation: (1) overall risk-taking variable (OVERRISK); (2) the

interaction term between overall risk-taking and Islamic bank (OVERRISK_ IB); (3) the interaction term between the risk governance index and overall risk-taking (RGI_OVERRISK); and (4) the three-way interaction between the risk governance index, overall risk-taking, and Islamic bank (RGI_OVERRISK_IB). First, the overall risk variable (OVERRISK) captures the general effect of risk-taking on banks' financial performance. This relationship indicates the effectiveness of bank risk management. Specifically, the risk-return trade-off states that a higher return can be achieved by taking higher risks. Therefore, a significant positive coefficient of OVERRISK signifies the effective risk management of banks. Other than that, insignificant or significantly negative coefficients of OVERRISK imply that bank risk management is ineffective. Second, the interaction term OVERRISK_IB provides a comparison of risk management effectiveness between CBs and IBs. Third, the interaction RGI_OVERRISK indicates whether risk governance mechanisms influence the effectiveness of bank risk management. Finally, the three-way interaction RGI_OVERRISK_IB implies whether the influences of risk governance mechanisms on risk management effectiveness are different across the two bank types.

As explained, the obtained insignificant OVERRISK and OVERRISK_IB coefficients for both accounting and market performances imply that CBs and IBs do not perform effective risk management due to their false risk judgements. However, risk governance mechanisms positively influence this. Basically, the significantly positive interaction between the risk governance index and risk-taking (RGI_OVERRISK) is likely to make the insignificant OVERRISK positive and statistically significant, as the absolute value of the interaction term coefficient is much higher than that of the OVERRISK coefficient (0.437 vs 0.057). This indicates that stronger risk governance effectively improves banks' risk management. Furthermore, taking into account Islamic banks in the three-way interaction RGI_OVERISK_IB, its significantly negative coefficient has an absolute value similar to the positive coefficient of RGI_OVERISK (0.421 vs 0.437). This implies that the improvement in risk management brought about by strong risk governance virtually disappears in IBs. Therefore, it can be concluded that risk governance in IBs is not effectively managing the risks.

Combining these findings with all the findings from Tables 4.5-4.9, the results on both accounting and market performance measures suggest that stronger risk governance mechanisms can enhance the risk management effectiveness, besides mitigating the banks' risk-taking activities. However, in the case of IBs, whilst risk governance mechanisms reduce

risk-taking, they do not improve the effectiveness of the banks' risk management. This is an interesting finding to be explored. As emphasised earlier, lower risk does not necessarily mean better risk management if the lower risk is monitored without any consideration of returns. For example, the RC can put pressure on management to lower the risk they take through stricter monitoring. However, if the RC does not consider the change of returns, management may end up forgoing high-risk high-return projects. As a result, risk governance may not improve or even worsen the risk management effectiveness. This is likely to be the case with IBs, as they have more pressures from many other restrictions such as Shari'ah compliance. Furthermore, most Islamic clients are religious clients, who tend to be risk averse. Therefore, risk governance focuses more on reducing risk than on effective risk management for higher returns.

The coefficient of CEO-Duality has a positive and significant relationship with ROAA, ROAE, TOBINQ, and MTB, confirming the idea that a CEO with a BOD chairman position would achieve high performance because of their ability to take higher risk. The results suggest that higher debt decreases the ROAA, but increases market performance. LOANTA shows a positive and significant relationship with ROAA, ROAE, and MTB, which indicates that higher risk would lead to higher performance. Consistent with previous literature, we find that cost efficiency is related with performance negatively for both accounting and market measures. Importantly, we find that IBs have a lower accounting performance but a stronger market performance than CBs. LOGGDP is negatively related to accounting performance, but positively related to market performance. We also find that the G-Index is negatively related to market performance, but is positively related to accounting performance. While the HHI is negatively related to accounting performance, it has a positive relationship with market performance. This shows that high competition in the market causes banks to take higher risks, leading to lower profits for banks. However, this is not the case for the bank market value, as the market value can be increased if banks take higher risks. Also, we find that LEGAL has a positive impact on both accounting and market performance. This indicates that countries with a strict Islamic legal system have a higher performance.

	Accounting performance		Market performance	
	(1)	(2)	(3)	(4)
VARIABLES	**ROAA**	**ROAE**	**TOBINQ**	**MTB**
RGI	0.180***	0.839*	-0.005	-0.040
	(0.065)	(0.501)	(0.005)	(0.042)
RGI_IB	-0.065	-0.119	-0.011	-0.084
	(0.081)	(0.593)	(0.008)	(0.060)
RGI_OVERRISK	0.437**	3.674***	0.050***	0.480***
	(0.177)	(1.342)	(0.017)	(0.126)
RGI_OVERRISK_IB	-0.421*	-3.515**	-0.045**	-0.454***
	(0.219)	(1.533)	(0.021)	(0.155)
OVERRISK	0.057	-0.042	-0.043	-0.248
	(0.254)	(2.031)	(0.027)	(0.210)
OVERRISK_IB	-0.278	-0.687	0.025	0.060
	(0.278)	(2.082)	(0.029)	(0.225)
BODSIZE	0.087***	0.332	0.000	-0.027
	(0.033)	(0.248)	(0.003)	(0.025)
BODIND	-0.336	-2.092	-0.023	-0.155
	(0.206)	(1.434)	(0.019)	(0.149)
CEO-Duality	0.368*	3.172*	0.070***	0.567***
	(0.221)	(1.724)	(0.025)	(0.169)
LOGTA	0.026	-0.048	0.002	-0.008
	(0.058)	(0.432)	(0.008)	(0.052)
DEPOTA	0.291	3.792	0.115	0.118
	(0.835)	(4.971)	(0.075)	(0.495)
LEV	0.050***	0.056	-0.002*	-0.024***
	(0.013)	(0.082)	(0.001)	(0.009)
NONINT	0.977	6.649*	-0.003	0.015
	(0.619)	(3.789)	(0.057)	(0.400)
LOANTA	0.985*	10.95***	0.059	0.673*
	(0.567)	(4.137)	(0.052)	(0.388)
COSTEFF	-0.047***	-0.282***	-0.001***	-0.012***
	(0.005)	(0.033)	(0.000)	(0.003)

Table 4.10 The effective of the risk governance effectiveness on the association between risk-taking and performance

	Accounting performance		Market performance	
	(1)	(2)	(3)	(4)
VARIABLES	**ROAA**	**ROAE**	**TOBINQ**	**MTB**
ISLAMIC	-0.127	-1.858**	0.066***	0.563***
	(0.120)	(0.874)	(0.013)	(0.101)
LOGGDP	-0.203**	-1.593**	0.048***	0.337***
	(0.081)	(0.620)	(0.012)	(0.094)
G-Index	0.493**	2.498*	-0.097***	-0.879***
	(0.195)	(1.485)	(0.028)	(0.229)
HHI	-2.369*	-21.26**	0.629***	4.507***
	(1.294)	(9.856)	(0.143)	(1.288)
LEGAL	0.516***	2.685**	0.042**	0.224
	(0.189)	(1.301)	(0.020)	(0.159)
Constant	2.423*	26.21***	0.377**	-2.208*
	(1.354)	(9.605)	(0.159)	(1.296)
YEAR EFFECTS	YES	YES	YES	YES
Observations	228	228	223	228
R-squared	0.749	0.693	0.613	0.587

Notes: The table presents regression results for banks' risk governance effectiveness in managing the risk and its effect on the bank' performance for full samples for the period 2009-2015. ROAA is return on average assets. ROAE is return on average equity. Both of ROAA and ROAE measures provide accounting based performance measures. TOBINQ is Equity MV plus liability BV divided by asset BV, and MTB is market to book value of equity. Both of TOBINQ and MTB measures provide market based performance measures. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. RGI_IB is the interaction between risk governance index and Islamic bank. RGI_OVERRISK is the interaction between risk governance index and overall risk. RGI_OVERRISK_IB is the interaction between risk governance index and overall risk and Islamic banks. OVERRISK is factor analysis eigenvalue obtained from five risks aspects that tested before. OVERRISK_IB is the interaction variable between overall risk and Islamic bank dummy variable. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. DEPOTA is total deposit to total assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. LOANTA is total loan total assets. . COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise. LOGGDP is the country GDP per capita measured by Natural logarithm of GDP per capita. G-Index is country corporate governance quality measured by six indicators. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 4.10 *(Continued)*

4.4.3 Robustness checks

As mentioned earlier, we conducted several tests for our robustness check. First, in all the result tables for the five investigated risk perspectives (Tables 4.5-4.9, columns 1-3), we used different sets of control variables and different dummy fixed effects (year and countries) to examine the relationship between risk governance mechanisms and risk-taking aspects. Intriguingly, our results hold across all specification models (1-3). Second, for each risk aspect we employed an alternative measure to test if the findings would hold. These alternative measures were: idiosyncratic risk (IDR) for market risk, loan losses reserve (LLR) for credit risk, standard deviation of operation income (SDOI) for operational risk, liquid and cash equivalent to total assets (LA) for liquidity risk, and the inverse ratio of the equity to total assets to SDROAA (INZscore2) for insolvency risk. According to the results presented in column 4 of each table, consistent findings were found for all these measures.

Third, following Wintoki et al. (2012), we employed GMM as another statistical test to control for endogeneity problems. Column 5 in our Tables 4.5-4.9 presents the retesting

results for the risk governance-risk-taking relationship using the GMM specification model. It has shown that the results still hold consistently across all our risk perspectives using this alternative method. The validity tests confirm that our GMM estimators are valid. We report the first-order serial correlation (*AR*(1)), which shows a significant result (p-value < 5%) across all our risk perspectives. This means that the null hypothesis can be rejected, and hence confirms that the residuals in the first differences are correlated. We also present the second-order correlation (*AR*(2)) and Hansen tests of over-identification in all our risk perspectives (Tables 4.5-4.9). The *AR*(2) tests yield a p-values of 0.41, 0.50, 0.12, 0.13, and 0.97 for market, credit, operational, liquidity, and insolvency risks, respectively. This means that there is no sufficient evidence to reject the null hypothesis of no serial correlation of second differences. Furthermore, the Hansen results show that we cannot reject the hypothesis that our instruments are valid. Moreover, Tables 4-8 reveal the exogeneity tests of a subset of our instruments. The results of these tests declare that the additional subset of instruments (as lagged differences) is exogenous.

Fourth, to capture a full picture of the relationship between risk governance mechanisms and banks' risk-taking, we construct an index containing all of our risk perspectives, using the factor analysis approach.[49] Table 4.11 provides the results for regressing the overall risk index (OVERRISK) on the RGI. Column 1 in the table shows the regression specification, including only the banks' financial and governance characteristics. The regression specification results in column 2 include the country fixed effect, in addition to the variables that have already been included in column 1. Column 3 additionally includes the country characteristics and year fixed effect in our regression for more sensitivity tests, and columns 4 is for more robustness checks.

[49] Our index includes all risk perspectives, these are: market, credit, operational, liquidity, and insolvency risks. We try to make all the measures with the same directions so we take the invers ratio of the CAT (1/CTA).

	Baseline estimation			Robustness check
	(1)	(2)	(3)	(4)
VARIABLES	**OVERRISK**	**OVERRISK**	**OVERRISK**	**GMM**
OVERRISK_lag				0.501***
				(0.061)
RGI	-0.092***	-0.064***	-0.060**	-0.073**
	(0.021)	(0.023)	(0.025)	(0.035)
RGI_IB	-0.013	-0.042	-0.039	0.092
	(0.035)	(0.035)	(0.034)	(0.064)
BODSIZE	-0.074***	-0.036*	-0.066***	-0.001
	(0.020)	(0.019)	(0.018)	(0.029)
BODIND	0.186**	0.394***	0.174*	0.154
	(0.094)	(0.110)	(0.092)	(0.179)
CEO-Duality	0.116	0.015	0.111	-0.244
	(0.078)	(0.099)	(0.083)	(0.618)
INSTOWN	0.177	0.202	0.174	0.188
	(0.133)	(0.137)	(0.130)	(0.260)
LOGTA	-0.143***	-0.149***	-0.140***	-0.012
	(0.035)	(0.042)	(0.042)	(0.117)
AGE	0.003	0.005**	0.004	-0.003
	(0.002)	(0.003)	(0.003)	(0.003)
ROAA	-0.111***	-0.151***	-0.116***	-0.052
	(0.037)	(0.039)	(0.038)	(0.038)
DEPOTA	-0.690**	-0.367	-0.566	0.588
	(0.325)	(0.376)	(0.354)	(0.578)
TIER1	-0.024***	-0.027***	-0.021***	-0.015*
	(0.007)	(0.006)	(0.007)	(0.009)
LEV	0.022**	0.031***	0.019**	0.023**
	(0.010)	(0.010)	(0.010)	(0.010)
NONINT	0.783***	0.838***	0.879***	0.284
	(0.254)	(0.286)	(0.284)	(0.454)

Table 4.11 Regression results on banks' risk governance and banks' overall risk

	Baseline estimation			Robustness
VARIABLES	(1) **OVERRISK**	(2) **OVERRISK**	(3) **OVERRISK**	(4) **GMM**
GROWTHOPP	0.271	0.418	0.311	0.416
	(0.292)	(0.315)	(0.301)	(0.444)
ISLAMIC	0.376***	0.437***	0.417***	-0.226
	(0.076)	(0.080)	(0.074)	(0.200)
GDPGROWTH			0.010	0.002
			(0.006)	(0.007)
G-Index			0.115	0.041
			(0.111)	(0.256)
DIR			-0.003	-0.007
			(0.031)	(0.056)
HHI			-0.833	-1.951
			(0.581)	(1.730)
LEGAL			-0.134	-0.131
			(0.111)	(0.212)
Constant	2.728***	1.942***	2.750***	-0.208
	(0.618)	(0.698)	(0.773)	(1.887)
YEAR EFFECTS	NO	NO	YES	YES
COUNTRY EFFECTS	NO	YES	NO	NO
Observations	211	211	211	188
R-squared	0.588	0.679	0.633	
AR (1) test (p-value)				0.005
AR (2) test (p-value)				0.183
Hansen test of over-identification (p-value)				0.963
Diff-in- Hansen test of exogeneity (p-value)				0.301

Notes: The table presents regression results for banks' risk governance index and overall risk for all samples for the period 2009-2015. OVERRISK is factor analysis eigenvalue obtained from five risks aspects that tested before. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. RGI_IB is the interaction between risk governance index and Islamic bank. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. ROAA is return on average assets. DEPOTA is total deposit to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. GROWTHOPP is Equity MV plus liability BV divided by asset BV. ISLAMIC is unity if the bank is Islamic, 0 otherwise. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 4.11 *(Continued)*

The results of Table 4.11 show that the coefficients of RGI consistently carry a negative and significant association with the banks' overall risk-taking. This confirms our previous results from the main analysis that risk governance mechanisms mitigate risk-taking effectively. However, the insignificant interaction variables (RGI_IBs) indicate that the obtained mitigation of risk caused by risk governance mechanisms is relatively similar across CBs and IBs.

Fifth, as our sample consist of both banks with a stand-alone board risk committee (treatment group) and banks without a stand-alone board risk committee (control group), we use propensity score matching to perform matched sample analysis. We estimate our main regression based on two classifications. First, we classify banks' categories based on the RC

existing only. Second, we classify the banks in our sample based on the existence of both RC and CRO. We use the full sample (2009-2015) to estimate a bank's propensity to form a stand-alone board risk committee and/or to assign CRO based on a number of governance characteristics, banks-specific characteristics and country code. For the banks' governance, we include board size, board independence, CEO-Duality and CROPRESENT. For the banks' specific characteristics, we create a set of variables that reflect the banks' balance sheets and income structure. These are; deposit ratio, leverage ratio, loan to assets ratio, and non-interest to income ratio. We also control for the bank size, bank type and country code. The R^2 obtained from the first estimation (logistic regression) indicate that the probability of forming a stand-alone board risk committee is around 28% and 24% for the other group (forming a stand-alone board risk committee and assigning CRO). However, the result for first group (only RC existing) shows that there is a significant difference between the two matched samples (banks with RC and without RC); that is banks with RC existing have lower overall risk-taking activities.[50] The same result is found for the second classification. However, we also use the matched-sample technique to estimate the association between RGI and risk-taking. The results from this analysis are presented in Table 4.12 (column 1 for first classification and column 2 for second classification), which are consistent with our main inferences that stronger RGI is associated with less enterprise- wide risk.

Finally, we use additional control variables for both models (risk-taking and performance) to estimate our regressions. Our main independent variables results are holds across these additional tests. These tests are presented in appendices 4 and 5.

[50] We use the weights that generated from the first stage regression (logistics regression for the adoption of RC) to match the two groups; these are banks with RC (treatment group) and banks without RC (control group). However, the matching process between the outcome of the treatment group and outcome of the control group allows us to determine the average treatment effect, which shows a significant difference in the mean value of risk-taking between the two groups for each category. The mean value of OVERRISK for banks that have a risk committee (treatment group) is -0.17, whereas banks without risk committee (control group) have a mean value of 0.588.

VARIABLES	(1) OVERRISK	(2) OVERRISK
RGI	-0.060**	-0.115***
	(0.028)	(0.031)
RGI_IB	-0.121***	-0.019
	(0.032)	(0.034)
BODSIZE	-0.106***	-0.061**
	(0.019)	(0.024)
BODIND	0.137	0.115
	(0.103)	(0.120)
CEO-Duality	0.092	0.543***
	(0.094)	(0.168)
INSTOWN	0.233**	0.259
	(0.102)	(0.180)
LOGTA	-0.163***	-0.147**
	(0.040)	(0.057)
AGE	0.007***	0.004
	(0.002)	(0.002)
ROAA	-0.225***	-0.123**
	(0.032)	(0.049)
DEPOTA	-0.205	-1.266***
	(0.411)	(0.401)
TIER1	-0.025***	-0.008
	(0.007)	(0.010)
LEV	0.025**	0.006
	(0.011)	(0.012)
NONINT	0.686**	0.468
	(0.298)	(0.328)
GROWTHOPP	0.571	-0.152
	(0.347)	(0.518)
ISLAMIC	0.512***	0.371***
	(0.083)	(0.084)
GDPGROWTH	0.005	0.020*
	(0.006)	(0.010)
G-Index	0.285*	0.066
	(0.146)	(0.194)
DIR	0.023	-0.035
	(0.034)	(0.050)
HHI	-0.493	-0.292
	(0.823)	(1.094)
LEGAL	0.014	0.131
	(0.098)	(0.151)
Constant	2.680***	3.806***
	(0.810)	(1.062)
YEAR EFFECTS	YES	YES
COUNTRY EFFECTS	YES	YES
Observations	311	171
R-squared	0.907	0.750

Note. See Appendix 2 for variables definitions. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Table 4.12 OLS regression using propensity matching score

4.5 Conclusions

Taking a great inspiration from the recent financial crisis over 2007-2008, for which the excessive risk-taking of banks has been the most blamed and criticised aspect, the current study attempts to learn more about bank's risk-taking and risk management systems. Notably, this study directs the focus on both conventional and Islamic banks. Specifically, the study investigates the effect of the recent new format of risk governance, i.e. a dedicated RC and CRO, on bank risk-taking and risk management effectiveness, in two different banking systems (CBs and IBs). Besides, unlike previous studies that only examined market risk and credit risk, this study is the first to consider risk-taking from five different risk perspectives: market, credit, liquidity, operational, and insolvency risks, to assure that the risk governance mechanisms are effective in managing and monitoring all risk types.

Intriguingly, we found that risk governance has the power to lower all five investigated risk types for CBs. This implies the effectiveness and value-added of having a dedicated risk committee and chief risk officer enhance risk management practices in banks. The findings are consistent with previous literature (e.g. Ellul and Yerramilli, 2013) who find that stronger risk governance index decreases market and credit risks. From the institutional theory perspectives, banks may create a separate risk committee and assign chief risk officer in order to enhance risk management practices in the banks, and monitor the executive management in regard to the matching of the banks risk appetite and profile. However, the findings are slightly different for IBs such that we did not document any significant effect of risk governance on credit risk, whilst the effects on other types of risk are relatively the same as those for CBs. One potential underlying reason of this insignificant relationship between risk governance and credit risk-taking is the unique and complex characteristic of IBs profit and loss sharing contracts. More specifically, members on risk committee and chief risk officer in IBs might face some difficulties in managing credit risk from PLS contracts as there are restrictions on the use of conventional hedging tools and a lack of approved hedging instruments that are compliant with *Shari'ah* laws. However, these results suggest that banks' risk-taking activities might be constrained by having stronger risk governance mechanisms for both CBs and IBs, except from credit risks, which are only applicable to CBs.

Up to this stage, the study has learned about the ability of risk governance to lower the risk-taking practices of banks. However, this mitigation of risks does not indicate an effective risk management. Basically, risk management is deemed to be effective when management understand the rationale behind every single risky decision that they make, i.e. the returns

associated with risky investments. According to the risk-return trade-off, an effective management should only take more risk for higher returns. It is true that risk governance's roles are to oversee and manage the level of risk that banks take. However, if the risk governance cannot understand and take into account the returns associated with the management's risky decisions during their monitoring process, this may impose unnecessary pressure that forces management to make an erroneous combination of risk-return investments. Hence, the effectiveness of risk management is damaged. Therefore, the study focus is extended further to this interest. The examination suggests that risk governance mechanisms can improve the effectiveness of bank risk management. This indicates that effective separate risk committee and chief risk officer can enhance the banks risk management effectiveness by taking appropriate decision regarding the risk-taking activities. Based on the agency theory, banks might apply stronger risk governance mechanism to increase the risk management effectiveness, and hence is more likely to meet and protect the shareholders' interests.

However, this result can only hold for CBs, not for IBs. Specifically, the risk governance of IBs has no influence on their risk management effectiveness. In the case of IBs, risk governance mechanisms reduce risk-taking, yet their ability to increase risk management effectiveness is not pronounced. Taking decision regarding risk activities without considering return levels may lead the management to forgo high-risk-high-return projects. This might be the case for IBs, as more pressures derived from *Shari'ah* law could be the reason of the risk governance failure to enhance the risk management effectiveness. Furthermore, it is also worthy to note that IBs clients are religious clients, who do not prefer high risk-taking. Thus, risk governance mechanisms in IBs might focus more on decreasing the risk, instead of increasing the risk management effectiveness.

The research area focusing on the effect of board quality on risk-taking is still limited. Previous studies such as (Pathan, 2009; Erkens et al., 2012; Minton et al., 2014; Sila et al., 2016) obtained mixed results when investigating the relationship between board quality and risk-taking. This study added more evidence to the literature by concentrating on the risk management-related to corporate governance mechanisms that are released by regulators to improve the oversight of risks. To the best of our knowledge, research on the oversight of RCs and CROs is rare and no previous studies in this area have paid attention to the Islamic banking system. Furthermore, our study also examines the effect of risk governance on the effectiveness of bank risk management, which has not been considered before. The

implications of our study can be applied for regulators and shareholders as it is associated with public policy concern in the financial industry. Also, it shows the possible advantages of having strong risk governance. Since the risk management function in IBs is not effective in managing risk, it is essential for regulators and policymakers to distinguish between business models of both types of banks when designing risk management policies. Furthermore, the regulators of Islamic banking should consider other *Shari'ah* risk management strategies that are not impersonator to CBs since both banks types have different aims.

Chapter 5. Conclusion

5.1 Introduction

The importance of firms being able to access domestic and international financial resources highlights the need for effective corporate governance for both developing and developed economies (Iskander and Chamlou, 2000). However, the corporate governance topic did not receive sufficient attention until the 1990s. More importantly, the recent financial crisis in 2007 increased the pressure to improve corporate governance mechanisms. Specifically, the failures of many large banks and other financial firms were recorded during the crisis, and corporate governance was mostly blamed for such events. For example, Bernanke (2010) argues that the failures of boards of directors to manage the emerging risks were the major underlying reason behind this financial crisis. He also stated that the global economy has been jeopardised as the crisis damaged the stability and profitability of the financial sector. Consequently, stronger corporate governance mechanisms in the financial sector have become more important than ever before, in order to ensure the sustainability and durability of the entire sector (Erkens et al., 2012).

Intriguingly, it was noted that Islamic banks (IBs) were not only less affected by the financial crisis, but indeed performed even better during that turbulent time. Because of this surprisingly resilient performance, scholars (e.g. Hasan and Dridi, 2010; Beck et al., 2013; Mollah and Zaman, 2015) started concentrating on this banking system. A few studies have investigated corporate governance issues in Islamic banks and how they are related to the banks' financial performance and risk-taking (Mollah and Zaman, 2015; Mollah et al., 2017a; Mollah et al., 2017b).

Furthermore, after the recent financial crisis, regulators introduced many corporate governance reforms in order to improve the governance practices of banks. Nevertheless, regardless of those reforms, many large banks such as the first NBC bank and the NBC bank of New Orleans have recently failed.[51] Therefore, banks' actual efforts to implement an effective corporate governance mechanism remain ambiguous and under debate. In this regard, the present thesis attempts to better understand the influences of corporate governance structure on the financial flexibility and risk management of the banking sector.

[51] First NBC bank failed in 2015, while NBC bank of New Orleans failed in 2017.

The thesis attempts to achieve three main empirical objectives. The first objective is to investigate the influences of board structure and its risk committee on financial flexibility. Within the implementation of this objective, the additional governance layer of Islamic banks and the Shari'ah supervisory board (SSB) is also examined. The second objective focuses on the relationship between risk governance mechanisms and risk-taking behaviours. The last objective attempts to explore risk governance reform and its impact on the effectiveness of risk management. The whole thesis centres around the context of the banking sector, taking into account and comparing both conventional and Islamic banks in the MENA region. To gain a better understanding of the main findings of this thesis, the following subsections provide more information regarding the empirical studies.

5.2 The main findings of the thesis

5.2.1 Objective 1 (Chapter 3): Corporate governance structures and financial flexibility – A comparison study between conventional and Islamic banks.

Financial flexibility is one of the main important factors that influence a firm's ability to survive financial distress and take investment opportunities. The acquirement of financial flexibility depends on the decision-making process of firms, which is directly influenced by the governance mechanism (Forbes and Milliken, 1999). Accordingly, this study investigates how corporate governance mechanisms affect banks' financial flexibility by investigating two governance mechanisms for both CBs and IBs: board of directors and risk committee. Furthermore, the unique governance layer of IBs, the Shari'ah supervisory board, is included.

The study shows that in general, effective boards of directors enhance banks' financial flexibility (conservative strategy). However, more attention should be paid to this board-flexibility association in specific banking systems. As expected, this study reveals a negative relationship between board size and financial flexibility for Islamic banks, whilst a positive relationship is obtained for conventional banks. These results may be theoretically explained by three reasons. These are: lack of board member knowledge about Shari'ah law, lack of protection for investment account holders (IAHs of profit-losing sharing accounts) on the board, and lower level of complexity for IBs compared to CBs. These three reasons make larger board to be costly and not effective for IBs. With a detailed investigation into sub-committees of the board, this empirical study supports the regulators' recommendation regarding the creation of a dedicated risk committee to manage and monitor the bank's risks. The results show that the existence of a risk committee enhances the bank's financial flexibility, and this evidence is more pronounced for CBs.

With regard to Islamic governance, this study further indicates that an effective Shari'ah supervisory board improves the IBs' financial flexibility. In particular, a larger SSB board with more expert members (multi-membership positions) enhances IBs' financial flexibility. This supports the argument that acquiring the clients' trust would enhance IBs' financial resources, as religious investors of banks gain their trust through the bank's compliance with Shari'ah.

Conclusion: *For conventional banks, a larger board size and a larger proportion of independent board members tend to increase the effectiveness of the board. Therefore, the study found that board size positively influences bank financial flexibility. In contrast with conventional banks, for Islamic banks, a smaller board size and a smaller proportion of independent board members increase the board's effectiveness. Hence, the study found that board size negatively influences the financial flexibility of Islamic banks. Combining the results of these two hypotheses suggests that the board effectiveness of banks enhances financial flexibility.*

Furthermore, the board of directors of banks often comprises a number of sub-committees specialised in the matters to be monitored. The study supports this view by providing evidence that creating a specialised risk board-level committee for bank risk matters improves banks' financial flexibility. These findings hold for both CBs and IBs, but are more pronounced for CBs.

Attention is also paid to the Shari'ah supervisory board of Islamic banks. The study found that a bigger SSB size and more multi-directorship members can increase banks' financial flexibility.

5.2.2 Objectives 2 and 3 (Chapter 4). Do Banks Effectively Manage their Risks? The Role of Risk Governance.

The risk-taking behaviour of firms has been a source of debate between academic researchers and practitioners. It is claimed that firms with excessive risk-taking behaviour would directly influence not only their success but more importantly their survivability. This risk-taking behaviour carries much more weight in the banking sector, as proved by the 2007 crisis. Banks that are too aggressive in their risk strategies can become insolvent. One bank's collapse would create a domino effect, causing the collapse of the whole financial system. Realising this criticality, the relationship between corporate governance and risk-taking behaviour received more attention after the recent financial crisis. In particular, banking industry regulators have recommended improving corporate governance mechanism-related to risk management in banks (e.g. creating a separate risk committee and appointing a chief risk officer). Noting the current risk governance reforms, this study is the first to analyse the effect of the risk governance on the risk-taking of both bank types. It is also the first to consider many different risk aspects of banks rather than just focusing on specific type (e.g. market and credit risk), as in previous literature.

In addition to the investigation of bank risk-taking behaviour, this study is also interested in learning whether risk governance effectively improves banks' risk management. In the event of a banking crisis, banks should reduce their risk-taking, following the regulators' pressure on boards of directors to manage risks. However, theoretically, it is hard to conclude how much reduction is appropriate, or whether risk reduction is truly a rational decision to make. Therefore, putting the objective of risk governance reform into a more general term, it is to increase the effectiveness of risk management.

The results of the second objective reveal that stronger risk governance monitoring may mitigate all types of risks for CBs. In contrast, the results are different for IBs. The study did not show a significant relationship between risk governance and credit risk, whilst the impacts on other types of risk are the same as with those of CBs. Besides testing the five risk aspects separately, the study confirms the relationship between risk governance mechanisms and all types of risk by constructing a comprehensive risk-taking index that consists of all these aspects. The result of the comprehensive risk index is consistent with each individual aspect. Furthermore, the investigation reaches the conclusion for the third objective, drawing on the findings such that risk governance mechanisms enhance the risk management effectiveness of

banks. Basically, the results show that the relationship between risk-taking and performance is more positive when the bank has a stronger risk governance. However, this evidence only holds for CBs, as the results suggest that IBs' risk governance does not significantly influence the effectiveness of managing IBs' risks.

Conclusion: *Risk governance mechanisms have been the focus topic in recent years. Specifically, creating a dedicated risk committee at the board level and assigning a chief risk officer tend to mitigate the risk-taking behaviour and increase the effectiveness of risk management. However, the study found that risk governance index is negatively associated with all risk perspectives (market, credit, operational liquidity, and insolvency risks) for conventional banks and Islamic banks; however, this relationship is positive with credit risk for Islamic banks. Combining the results of this study suggests that the risk governance index, which consists of RC and CRO, may mitigate the risk-taking behaviour of both CBs and IBs. Furthermore, risk governance mechanisms are assumed to not just mitigate risk-taking, but to increase the effectiveness of risk management. The study supports this view by providing evidence that developing strong risk governance monitoring enhances the positive relationship between risk-taking and performance. These findings hold only for CBs, and are not pronounced for IBs.*

5.3 Critical reflection

To achieve the main aims and objectives of the thesis, the implementation process of the thesis inevitably involves many difficulties and challenges. From the initial draft of research aims of objectives, research design, study samples, data collection, methodologies, to the final findings, countless of choices and trade-offs were required to be made with careful thought and consideration, together with many lengthy discussions with the supervisory team. The data collection of this thesis can be deemed to be the most challenging process, because corporate governance data required in this thesis, e.g., board of directors and board risk committee, for both conventional banks and Islamic banks can only be obtained manually through reading the banks' annual reports. Nevertheless, since this stage is the key to a valid and good research, it has been carried out with utmost attention and precaution. Overall, the implementation of the data collection process was considered highly successful. A combination of a good data and highly considerate statistical methods can facilitate the achievement of the overall aim of the study.

The presented findings and analysis of this thesis found that the relationship between corporate governance mechanisms and Islamic banks and conventional banks decision-

making process regarding their corporate financial and risk management policies is relatively unexplored. As observed in the literature, corporate governance mechanisms in the banking industry has not been explored very well, specifically for Islamic banking. Most of the literature cover this area in relation to the banks performance, and the on-going underlying processes (e.g., financial flexibility and risk-taking) that led to the ultimate goal of the firm has been relatively ignored. However, even though it is noted that corporate governance mechanisms-related to risk management, risk governance, (i.e., creating a dedicated risk committee and assigning chief risk officer) have been the focus by number of practitioner and academic in recent years (Lundqvist, 2015), studies on relationship between risk governance mechanisms and risk-taking is limited, and there is no study investigate the relationship between risk governance and risk management effectiveness in Islamic banks context.

Following the increasing attention and awareness on the roles of corporate governance and risk governance mechanisms within banking industries after the financial crisis 2008, together with a thorough review of the literature and theories within the field, the study has set forth to investigate the influences of corporate governance mechanisms on banks' financial flexibility, risk-taking behaviour, and risk management effectiveness in MENA region for both banking systems, Conventional and Islamic banks. Overall, the findings obtained indicate that effective corporate governance mechanisms can have positive impacts on banks financial positions, both conventional and Islamic banks, by increasing banks' financial flexibility, and reducing the currently deem-to-be-excessive risk taking. However, the findings assure the important need to develop an effective risk governance and risk management practices in Islamic banks as the thesis only shows improving of conventional bank's risk management effectiveness. Supported by the obtained finding, it is important to consider the banks type when placing the corporate governance mechanisms, as the IBs have unique characteristics (following *shari'ah* principle and having additional layer of corporate governance-*Shari'ah* supervisory board). In general, the obtained findings implies that IBs have unique corporate governance requirements that need to fit to their business model and operating system effectively to address the issue concerning effective risk management.

The research was initially built on different theories discussed in Chapter 2. Particularly, focusing on the monitoring roles stated in agency theory and the advisory roles emphasized in the resource-based theory, corporate governance mechanisms, including board of director structure, separate risk committee existence, and *Shari'ah* supervisory board, affect banks

financial flexibility. Furthermore, IBs results show some differences on how board of director structure affect financial flexibility. Within IBs, the results also highlight the important role of *shari'ah* supervisory board in enhancing the IBs financial flexibility. This supports the argument that IBs follow the agency theory with considering additional sources of conflict that is derived from violating *Shari'ah* principles, and adopt the additional layer of governance, as suggested in Islamic corporate governance model in chapter 2. In the second empirical study, the focus was paid primarily on institutional theory in supporting the relationship between risk governance and risk-taking. The findings obtained are adhered with this theory and supports the value-added of effective risk governance that consists of dedicated risk committee and chief risk officer in banks. However, the risk governance in IB is still suffering from achieving their role effectively, which indicates the important need for corporate governance model that considers the risk management issues in IBs. Overall, the findings of this thesis emphasize the important to pay more attention to changes and innovations of corporate governance codes and the unique corporate governance requirements for IBs.

5.4 Implication of the thesis

The obtained findings of this thesis present theoretical and practical implications for academic researchers, banks, and regulators. Although the theories employed in this thesis are among the most popular and applicable theories within the corporate governance topic, they remains quite general and can be malleable by different researchers with different understanding and interpretations. Therefore, based on the findings of this thesis, more explicit theoretical framework which can explain the impacts of different compositions and responsibilities of corporate governance mechanisms on a number of key financial constructs of banks can be constructed. For example, a different model of corporate governance practices that solves the conventional and unique agency issues of IBs may help to overcome the need to meet other stakeholder interests (e.g., Investment account holders) and preserving the *Shari'ah* law. The extension of the field in future research can be more proficiently built on such specific conceptual framework.

In addition to the theoretical implication, the findings of this thesis also provide strong implications to academic researchers to pay more attention to changes and innovations of corporate governance codes and their influences in the practical outsets, as well as to practitioners to employ and target corporate governance as a means to improve the financial

performances and management of banks. The findings of this thesis also provide several important implications for banks and regulators in practice. For banks in general, it is recommended to assign an optimal board structure to ensure effective monitoring and managing roles. In particular, the findings of the first empirical study documented a positive relationship between board size and financial flexibility for CBs and a negative relationship for IBs. This implies that the interests of shareholders and other stakeholders are more likely to be met if the board size is larger for CBs, but smaller for IBs. This conflicting finding indicates the importance of bank types in assigning board structure. Furthermore, the findings also suggest that both banks should consider creating a dedicated risk committee that exclusively oversees bank risks, to enhance the bank's financial flexibility level. In IBs specifically, further attention should be paid to the Shari'ah supervisory board. The results suggest that IBs' financial flexibility might be stronger if they have effective SSBs that ensure the stakeholders' trust in the bank's compliance with Shari'ah principles.
Justifying the recent recommendations by regulators regarding risk governance, this thesis supports the idea that improvements in risk governance through the different characteristics of risk committees and chief risk officer may mitigate banks' comprehensive risk-taking and improve their risk management effectiveness. Particularly, banks should consider a bigger risk-committee size, higher committee independence, more frequent meetings, more experts in the field of risk, and members' qualifications. Furthermore, they should also improve the roles of the CRO by making the CRO responsible for comprehensive risk, appointing the CRO to top executive management and to the risk committee, and requiring them to report directly to the board of directors.

Specific implications for regulators and policymakers in the MENA region are provided in this thesis. Particularly, similar to regulators in developed countries, regulators in the MENA region should impose more emphasis on the role of the board of directors in managing and monitoring risks and firms' financial reserves, especially after the recent financial crisis. Furthermore, regulators of banks should consider the type of bank when placing corporate governance codes regarding board structure. In addition, the studies also support the recent regulators' recommendation regarding the creation of risk committees. Therefore, the findings of this thesis might be useful for the regulators and agency authorities of Islamic Institutions, e.g. IFSB, to modify or develop the governance recommendations for board structure and risk governance. The findings also suggest that SSBs enhance stakeholders' trust and IBs' reputation. Therefore, this thesis also suggests that Islamic authorities should place their focus on SSBs if they aim to improve the banks' financial flexibility.

The thesis also contributes to the on-going efforts on developing and evaluating financial resilience measures and indicators of the firms. Number of independent organizations such as the International Risk Governance Council (IRGC) provide attention and guidance to build financial resilience/flexibility position to respond to unexpected risks. Thus, this thesis provides implications for regulators and banks by suggesting a method to measure financial resilience for the banks, which will help in triggering interests and funds from decision-makers. The results of this thesis are also worth considering since it provides insight about the effectiveness actions taken by board of directors and risk committee to build financial flexibility position.

The findings also provide evidence for shareholders and regulators that applying the recommended risk governance mechanisms effectively manages conventional banks' risk. However, this is not the case for IBs, as Islamic institution authorities might need to develop and improve Shari'ah compliant tools to make the risk governance system more effective in managing IBs' risks. Importantly, it is worth noting that besides the recent BSBC requirements regarding capital and liquidity practices, corporate governance issues can also be targeted to enhance the resilience and risk management of the banking sector.

5.5 Limitations and future research

Following the discussion of the thesis's findings and implications, this final section aims at discussing its limitations, based on which the identifications of future directions and research opportunities within the field are developed.

Similar to most of previous research, this thesis encounters a number of limitations. The main limitation is related to the employed data. Corporate governance mechanisms are generally challenging data to collect especially in developing countries such as MENA region. Together with recent updates of corporate governance structures including the dedicated board risk committee and chief risk officer, the data required in this thesis is not available on database. As a result, all data employed were collected manually, which can potentially expose to some problems. Firstly, due to the time constraints of a PhD study, the manual data collection process can limit the coverage of the study in terms of the numbers of corporate governance perspectives. Also, missing data is another issue that results in the omission of a number of banks and countries within the investigated region. Particularly, a criteria was set for the sample is to include only banks with at least two consecutive years of data. However, overall, the implementation of the data collection process was considered highly successful. Another

limitation of this thesis is that the scope of the study is limited by focusing on Islamic corporate governance practices in MENA region. Specifically, the findings of the research cannot be generalized to other Islamic governance system practised by other jurisdictions.

Based on the above mentioned limitations, number of future research are suggested below. As previously mentioned, financial flexibility in banks has not attracted sufficient attention from academics thus far, and in particular no studies have been conducted on Islamic banks. Given its relevance in practice, this thesis recommends further and more thorough study on this financial construct of banks, looking at different corporate governance perspectives. Specifically, one potential idea might be an examination of the effect of other board of directors characteristics on banks' financial flexibility. For example, a number of previous studies have confirmed the relationship between the financial qualifications of the independent members of the board and risk-taking, which in turn might affect the financial flexibility of the firm.

Another opportunity for further research regards the remuneration systems for chief risk officers and risk committee members. The remuneration system became the most debated issue in financial institutions after the recent financial crisis. The executives' motivations to take excessive risks are increased by the design of the remuneration system. Thus, this was considered to be one of the main reasons behind the financial crisis. Therefore, future research may consider the bounce and stock ownership of RC members and banks risk-taking. Furthermore, this could be accomplished using a comparison study between IBs and CBs. In this study, the governance data were collected manually from annual reports, and there was not enough time to collect the remuneration data in regards to CRO and RC members due to the limited duration of the PhD programme. Furthermore, such information was usually missing in the annual reports for the sample of this study in the MENA region, thus this could be discovered using a global sample.

Finally, this thesis employs the MENA region to conduct empirical studies where a number of data were missing. The results of the empirical studies might therefore be enhanced and supported by re-investigating the targeted corporate governance mechanisms of this thesis on both financial flexibility and risk-taking behaviour using a global sample.

Appendices

Appendix 1: Financial Flexibility Index (FFI) Measures

Financial Flexibility Proxies	Measurement	Judgment
Stable (Core) Funding to Assets (SFA) Ratio	SFA = ((Core Deposits *95%) + Core Capital + Debt with maturity longer than one year) / Total Assets	Is a bank's SFA > the mean average of the SFA for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise.
Liquid Assets (LA) Ratio	LA = Cash and Cash Equivalent / Total Assets	Is a bank's LA > the mean average of the LA for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise.
Insolvency Risks (Z-Score)	Z-Score = Return on Average Assets + Capital Assets Ratio / Standard Deviation of Return of Average Assets	Is a bank's Z-Score > the mean average of the Z-Score for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise.
Capital adequacy ratio (Tier1 ratio)	Tier 1 = Tier 1 capital as percentage of risk-weighted assets and of off-balance sheet risks	Is a bank's Tier 1 ratio > the mean average of the Tier1 for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise.
Loan losses provision (LLP) ratios	LLP = loan losses provision / total loans	Is a bank's LLP ratio < the mean average of the LLP for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise
The cost to income (Cost) ratio	Cost = the banks costs / total income	Is a bank's Cost ratio < the mean average of the Cost for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise
Return on Average assets (ROAA) ratio	ROAA = net income / average of total assets	Is a bank's Cost ratio > the mean average of the ROAA for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise
The liquid assets to deposits and short term funding (LIQR) ratio	LIQR= liquid assets / total deposit and short-term funding	Is a bank's LIQR ratio > the mean average of the LIQR for the full sample at time *t* in each country? A value of 1 if yes; 0 otherwise

Note: FFI is only include the first three proxies of financial flexibility. For robustness check, we measure our financial flexibility differently by adding the five rest proxies

Appendix 2: Variables Definitions of the Whole Thesis

Name	Abbreviation	Description
Panel A: DEPENDENT VARIABLE		
Financial Flexibility Index	FFI	An ordinary variable, ranging from 0 to 3, indicating different levels of financial
Market risk	TR	Total risk measured by the standard deviation of 60 monthly stock return consecutively with a minimum of 36 months to reflect the market risk
Credit Risk	IMPILOAN	The impaired loan to total loans to measure the credit risk
Operational Risk	SDROAA	The standard deviation of Return on Average Assets to measure operational risk.
Liquidity Risk	CTA	The cash to total assets to measure the liquidity risk
Insolvency Risk	InZscore1	The invers of the logzscore to measure the insolvency
Overall Risk	OVERRISK	Factor analysis eigenvalue obtained from five risks measures mentioned before
Account Performance	ROAA	ROAA is return on average assets.
Market Performance	TOBINQ	Equity MV plus liability BV divided by asset BV
Panel B: MAIN CORPORATE GOVERNANCE		
Board of Directors Size	BODSIZE	The total number of board of directors' members.
Board Independence	BODIND	Percentage of independent non-executive directors on the board of directors.
Risk Committee Existing	RCE	Dummy variable take value of 1 if the bank has dedicated risk committee and 0
Risk Governance Index	RGI	Risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics.
Shari'ah Supervisory Board Size	SSBSIZE	The total numbers of Shari'ah advisors on the board.
Shari'ah Supervisory Board Qualification	SSBQUAL	Percentage of Shari'ah advisors with financial qualifications on the SSB.
Shari'ah Supervisory Board Multi-directorships	SSBMULTI	multi-memberships, calculated as number of Shari'ah advisors serving on two or more additional (outside) firms divided by the number of Shari'ah advisors on the board.
Panel C: BANK and COUNTRY LEVEL CHARACTERISTICS		
CEO-Duality	CEO-Duality	Dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise
Insider Ownership	MANOWN	Percentage of shares held by executive directors to total number of shares
Institutional Ownership	INSTOWN	the institutional ownership measured by % shares held by institutions firms to total shares
Bank Age	AGE	The difference between the sample year and the year in which the bank was
Bank Size	LOGTA	Natural logarithm of total assets of a bank.
Bank Growth Opportunities	GROWTHOPP	Tobins' Q (Equity MV plus liability BV divided by asset BV).
Performance	ROAA	ROAA is return on average assets.
Bank Tier 1 Capital Ratio	TIER1	Core capital / Risk weighted assets

Cost of Income	COSTEFF	The bank cost efficiency measured by cost/net income
Income Diversification	NONIN	Non-interest income to total income
Leverage ratio	LEV	leverage ratio measured by total equity to total assets
Deposit ratio	DEPOTA	Total deposit to total assets
Loan Ratio	LOANTA	Total loan total assets
Loan Growth	LOANGROWTH	loan growth measured by the difference between current loan and the previous loan divided by previous loans
Islamic Bank	ISLAMIC	Dummy variable: 1 if the bank is Islamic, 0 otherwise.
GDP per capita	LOGGDPPC	Natural logarithm of Gross Domestic Products (GDP) per capita.
GDP Growth Rate	GDPGROWTH	Annual GDP growth rate.
Country Corporate governance	G-Index	country corporate governance quality measured by six indicators
Inflation Rate	INFL	Annual rate of inflation.
Hirschman -Herfindahl Index	HHI	The Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration.
Domestic Interest Rate	DIR	Deposit Interest Rate provided by the World Bank website; for years and
Legal System	LEGAL	0 for countries not using Shari'ah law to define their legal system, 1 for countries

Appendix 3: EMPIRCAL STUDY 1- The Relationship between Corporate Governance mechanisms and FF using Ordered Logistic Regression (FFI dependent)

	Full	IBs		CBs
	(1)	(2)	(3)	(4)
VARIABLES	FFI	FFI	FFI	FFI
BODSIZE	0.211***	-0.323*	-0.317**	0.356***
	(0.081)	(0.168)	(0.155)	(0.109)
BODIND	-0.019	-1.301	-0.347	0.068
	(0.481)	(1.079)	(0.956)	(1.033)
RCE	1.072***	1.570**	1.676**	1.223**
	(0.378)	(0.747)	(0.727)	(0.585)
SSBSIZE		0.613*		
		(0.335)		
SSBQUAL		-1.832		
		(1.318)		
SSBMULTI		2.372**		
		(1.130)		
SSB-Effectiveness			0.652*	
			(0.391)	
CEO-Duality	1.012**			
	(0.512)			
MANOWN	-0.358	0.840	0.428	-1.480
	(1.462)	(3.019)	(3.146)	(2.667)
AGE	0.005	-0.071***	-0.043**	0.022
	(0.009)	(0.023)	(0.019)	(0.014)
LOGTA	0.154	-0.622	-0.653*	0.039
	(0.163)	(0.404)	(0.374)	(0.284)
GROWTHOPP	3.131***	2.626	2.889	7.612**
	(1.103)	(2.078)	(1.758)	(3.643)
ROAA	-0.233	-1.313***	-1.353***	0.337
	(0.230)	(0.343)	(0.337)	(0.406)
RISK	-1.145***	-1.389***	-1.194***	-3.909***
	(0.230)	(0.410)	(0.369)	(0.867)
TIER1	0.066***	0.139***	0.136***	-0.016
	(0.023)	(0.045)	(0.041)	(0.037)
COSTEFF	-0.015	-0.131***	-0.132***	-0.005
	(0.015)	(0.025)	(0.023)	(0.021)
ISLAMIC	0.925***			
	(0.292)			
LOGGDPPC	-0.798***	-2.001***	-1.457***	-0.394
	(0.253)	(0.606)	(0.484)	(0.385)
GDPGROWTH	0.039	0.051	0.042	-0.057
	(0.042)	(0.078)	(0.077)	(0.071)
GOVERMENT-E	0.888**	1.374**	1.221*	1.538**
	(0.410)	(0.699)	(0.698)	(0.688)
INFL	-0.053	0.016	0.004	-0.077
	(0.052)	(0.145)	(0.143)	(0.081)
HHI	-8.542***	-16.94**	-12.66**	-4.614
	(2.119)	(6.760)	(5.975)	(3.347)
DIR	-0.634***	-0.732***	-0.584**	-0.375*
	(0.132)	(0.276)	(0.253)	(0.225)
LEGAL	-1.659***	-0.437	0.481	-2.869**
	(0.535)	(1.223)	(1.052)	(1.128)
Year Effects	YES	YES	YES	YES
Observations	317	126	126	191
R^2	0.159	0.318	0.299	0.296

Appendix 4: EMPIRCAL STUDY 2- The Relationship between Risk Governance and Risk-taking using Additional Controlling Variables

VARIABLES	(1) Market risk	(2) Credit risk	(3) Operational risk	(4) Liquidity risk	(5) Insolvency risk	(6) Overall Risk
RGI	-0.003*	-2.048***	-0.089**	0.991**	-0.028**	-0.061**
	(0.002)	(0.587)	(0.039)	(0.415)	(0.011)	(0.024)
RGI_IB	0.001	1.719**	0.0182	-0.045	-0.002	-0.035
	(0.003)	(0.740)	(0.065)	(0.566)	(0.024)	(0.038)
BODSIZE	0.001	-1.301***	-0.117***	0.498*	-0.036***	-0.055***
	(0.002)	(0.393)	(0.031)	(0.257)	(0.011)	(0.018)
BODIND	0.026***	7.502***	0.0195	3.608***	0.024	0.222**
	(0.008)	(2.416)	(0.174)	(1.234)	(0.048)	(0.093)
CEO-Duality	0.0001	4.628	0.164	-6.183***	0.144	0.119
	(0.010)	(3.673)	(0.187)	(2.033)	(0.091)	(0.109)
INSTOWN	-0.008	3.183*	0.320*	4.818***	0.071	0.243*
	(0.010)	(1.762)	(0.190)	(1.733)	(0.048)	(0.136)
MANOWN	-0.033	-0.514	0.295	17.09***	-0.095	-0.154
	(0.028)	(5.602)	(0.589)	(4.845)	(0.154)	(0.364)
LOGTA	-0.012***	-3.095***	-0.269***	1.655***	-0.070***	-0.168***
	(0.003)	(0.717)	(0.064)	(0.604)	(0.020)	(0.048)
AGE	-0.004	0.151***	0.0063	-0.045	0.002***	0.005*
	(0.001)	(0.045)	(0.004)	(0.034)	(0.001)	(0.002)
ROAA	0.001	-1.662*	-0.150*	-2.211***	-0.065**	-0.080*
	(0.003)	(0.866)	(0.088)	(0.696)	(0.025)	(0.047)
DEPOTA	-0.055	-20.23***	0.071	-0.023	-0.006	-0.360
	(0.040)	(6.655)	(0.556)	(4.689)	(0.176)	(0.382)
TIER1	-0.002***	-0.775***	-0.038***	0.263**	-0.012***	-0.026***
	(0.001)	(0.163)	(0.011)	(0.116)	(0.002)	(0.007)
LEV	0.001	0.732***	0.076***	-0.348**	0.009***	0.024**
	(0.001)	(0.230)	(0.016)	(0.162)	(0.003)	(0.010)
NONINT	0.040*	22.30***	0.998*	9.678***	0.262*	0.801***
	(0.022)	(7.511)	(0.584)	(3.301)	(0.134)	(0.297)
GROWTHOPP	-0.007	5.834	1.103**	-12.24**	0.424***	0.364
	(0.025)	(5.184)	(0.537)	(4.867)	(0.160)	(0.357)
LOANTA		-10.75**				
		(4.737)				
LOANGROW		-0.036				
		(0.025)				
COSTEFF	0.002	-0.090*	0.004	-0.152***	0.001	0.004
	(0.0002)	(0.053)	(0.004)	(0.036)	(0.001)	(0.002)
ISLAMIC	0.019***	5.856***	0.407***	2.237**	0.112***	0.393***
	(0.005)	(1.406)	(0.104)	(0.940)	(0.028)	(0.075)
LOGGDPPC	0.014***	-3.335***	-0.0194	-3.469***	-0.020	0.0912
	(0.005)	(1.044)	(0.095)	(1.022)	(0.028)	(0.069)

Appendix 4 (continue)

VARIABLES	(1) Market risk	(2) Credit risk	(3) Operational risk	(4) Liquidity risk	(5) Insolvency risk	(6) Overall Risk
GDPGROWTH	0.001*	-0.059	0.010	0.075	0.001	0.011
	(0.001)	(0.129)	(0.012)	(0.127)	(0.003)	(0.007)
G-Index	0.0133	4.494**	0.166	3.608	0.125**	0.155
	(0.010)	(2.166)	(0.210)	(2.490)	(0.060)	(0.163)
INFL	0.002**	-0.183	0.004	-0.303	-0.005	0.029**
	(0.001)	(0.260)	(0.018)	(0.193)	(0.005)	(0.012)
DIR	0.010***	-0.330	-0.0393	1.695***	-0.005	0.0187
	(0.004)	(0.643)	(0.055)	(0.589)	(0.015)	(0.036)
HHI	-0.196***	-8.623	-1.447*	-2.521	-0.268	-1.114*
	(0.048)	(13.96)	(0.871)	(9.962)	(0.203)	(0.670)
LEGAL	0.0162	-1.443	-0.248	2.041	0.022	-0.122
	(0.011)	(2.617)	(0.195)	(1.972)	(0.058)	(0.127)
Constant	0.170**	105.8***	4.584***	24.80*	1.400***	1.660*
	(0.072)	(18.88)	(1.489)	(13.38)	(0.399)	(0.976)
Year Effects	YES	YES	YES	YES	YES	YES
Observations	223	202	222	206	221	209
R-squared	0.575	0.748	0.649	0.650	0.570	0.652

Notes: The table presents regression results for banks' risk governance index and credit risk for all samples for the period 2009-2015. IMPILOAN is the impaired loan to total loans to measure the credit risk. LLR is loan losses reserve to gross loans. RGI is risk governance index measured using the first principal component of the risk committee and chief risk officer characteristics. RGI_IB is the interaction between risk governance index and Islamic bank. BODSIZE is the total number of BOD members. BODIND is % independent non-executive directors in the BOD. CEO-Duality is dummy variable takes value of 1 if the CEO and the chairman of the board is the same person, and 0 otherwise. INSTOWN is the institutional ownership measured by % shares held by institutions firms to total shares. MANOWN is the insider ownership measured by % shares held by executive directors to total shares. LOGTA is the bank's size measured by natural logarithm of total assets. AGE is the difference between the sample year and the year in which the bank was established. ROAA is return on average assets. DEPOTA is total deposit to total assets. TIER 1 is banks' capital ratio measured by Core capital / Risk weighted assets. LEV is leverage ratio measured by total equity to total assets. NONIT is non-interest income to total income. GROWTHOPP is Equity MV plus liability BV divided by asset BV. LOANTA is total loan total assets. LOANGROWTH is loan growth measured by the difference between current loan and the previous loan divided by previous loans. COSTEFF is the bank cost efficiency measured by cost/net income. ISLAMIC is unity if the bank is Islamic, 0 otherwise. LOGGDPPC is the country GDP per capita measured by Natural logarithm of GDP per capita. GDPGROWTH is the GDP growth rate. G-Index is country corporate governance quality measured by six indicators. INFL is the annual rate of inflation DIR is the deposit Interest Rate. HHI is the Hirschman-Herfindahl Index measures bank market concentration. HHI is calculated as the square sum of the ratio of total assets of each bank-year to total assets of all banks each year. It has a value between zero and one. Higher HHI shows higher bank concentration. LEGAL (legal system) is religiosity proxy which take value of 0 if the country not using Shari'ah law, 1 for countries combing both Shari'ah law and other legal system, and 2 for countries with only shari'ah law. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Appendix 5: EMPIRCAL STUDY 2- The Relationship between Risk Governance and Risk management effectiveness using Additional Controlling Variables

VARIABLES	(1) **ROAA**	(2) **ROAE**	(3) **TOBINQ**	(4) **MTB**
RGI	0.089	0.157	-0.004	-0.025
	(0.074)	(0.575)	(0.006)	(0.052)
RGI IB	0.029	0.622	-0.003	-0.057
	(0.085)	(0.613)	(0.007)	(0.069)
RGI OVERRISK	0.310*	2.657**	0.038**	0.441***
	(0.165)	(1.314)	(0.014)	(0.123)
RGI OVERRISK	-0.310*	-2.594*	-0.034**	-0.423***
	(0.195)	(1.444)	(0.016)	(0.134)
OVERRISK	-0.221	-2.275	-0.023	-0.057
	(0.235)	(1.936)	(0.023)	(0.188)
OVERRISK IB	0.015	1.755	0.019	-0.071
	(0.254)	(1.989)	(0.024)	(0.207)
BODSIZE	0.120***	0.615**	-0.001	-0.042*
	(0.034)	(0.248)	(0.002)	(0.025)
BODIND	-0.346	-2.348	-0.024	-0.134
	(0.215)	(1.532)	(0.018)	(0.149)
CEO-Duality	0.181	1.781	0.065***	0.615***
	(0.190)	(1.551)	(0.017)	(0.137)
INSTOWN	-0.343	-2.788	0.019	0.319*
	(0.224)	(1.708)	(0.025)	(0.180)
AGE	-0.006	-0.056**	-0.001**	-0.003
	(0.003)	(0.027)	(0.001)	(0.003)
LOGTA	-0.050	-0.596	0.017***	0.103**
	(0.056)	(0.407)	(0.006)	(0.047)
DEPOTA	-0.054	1.027	-0.052	-0.821*
	(0.884)	(5.413)	(0.070)	(0.466)
TIER1	-0.003	-0.006	0.003**	0.016
	(0.014)	(0.095)	(0.001)	(0.010)
LEV	0.039**	-0.048	-0.006***	-0.045***
	(0.017)	(0.118)	(0.002)	(0.014)
NONINT	0.947	6.514*	0.012	0.188
	(0.608)	(3.768)	(0.052)	(0.388)
LOANTA	1.128*	12.23***	0.085	0.919**
	(0.596)	(4.236)	(0.051)	(0.407)
COSTEFF	-0.045***	-0.264***	-0.002***	-0.016***
	(0.005)	(0.031)	(0.001)	(0.002)
ISLAMIC	-0.137	-2.020**	0.051***	0.496***
	(0.114)	(0.872)	(0.012)	(0.112)
GDPGROWTH	0.031***	0.217***	0.002***	0.017**
	(0.010)	(0.076)	(0.001)	(0.007)
G-Index	0.255	0.580	-0.053**	-0.556***
	(0.214)	(1.570)	(0.024)	(0.186)
HHI	-2.728**	-23.66**	0.428***	3.290***
	(1.374)	(10.03)	(0.125)	(1.075)
DIR	0.139***	1.055***	-0.006	-0.065*
	(0.049)	(0.389)	(0.004)	(0.037)
LEGAL	0.591***	3.201**	0.046**	0.247
	(0.191)	(1.471)	(0.018)	(0.154)
Constant	1.348	17.23*	0.806***	0.425
	(1.364)	(9.455)	(0.128)	(1.005)
YEAR EFFECTS	YES	YES	YES	YES
Observations	228	228	219	224
R-squared	0.775	0.725	0.677	0.631

See Appendix 2 for variables definition. Heteroscedasticity-robust standard errors are in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

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