Risk Governance: Impact of the Risk Committee and Chief Risk Officer on Banks' Risk and Performance

A Thesis Submitted for the Degree of Doctor of Philosophy By

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Abstract

This study empirically examines the effects of Risk Committee (RC) characteristics and Chief Risk Officer (CRO) attributes on the risk and performance of U.S. commercial banks, specifically from the period 2016-2019. Using a sample of 241 banks with 966 bank-year observations, the research investigates the relationships between RC and CRO characteristics and three distinct types of risk - credit, regulatory, and insolvency – and two performance measures: Return on Equity (ROE) and Return on Assets (ROA).

This study explores the impact of Risk Committees (RCs) and Chief Risk Officers (CROs) in the context of U.S. commercial banks' risk management and performance. The analysis shows that RC existence correlates significantly with a reduction in credit risk, possibly due to heightened attention towards managing this crucial risk factor. However, RC presence doesn't markedly affect regulatory or insolvency risks, nor does it significantly impact key performance metrics such as Return on Equity (ROE) and Return on Assets (ROA). RC size positively associates with credit risk, suggesting that larger RCs might have greater confidence in managing and controlling such risks. Still, no significant relationship is found with other risks or performance measures. Interestingly, RC independence doesn't significantly influence any risk or performance measures. This study reveals a positive correlation between the qualifications of Risk Committee (RC) members in finance and accounting and the acceptance of higher credit risk by banks. This implies that well-qualified RC members, armed with their depth of knowledge and experience, might enable the bank to navigate and manage higher levels of risk more confidently. However, the study finds no significant association between RC qualifications and regulatory risk, insolvency risk, and the bank's performance, possibly due to various factors not captured fully by the study models. Moreover, the study establishes a significant positive relationship between the frequency of RC meetings and credit risk, suggesting that more active RCs (those holding frequent meetings) tend to take on more credit risk. This behaviour might reflect greater confidence due to their active involvement in risk management. However, a significant negative relationship was observed between the number of RC meetings and regulatory risk, implying that active RCs could help mitigate regulatory risk. The study found no significant impact of RC meetings on the bank's performance.

The research also considers specific attributes of the CRO. It reveals that the presence of a CRO in an organization shows no significant association with credit, regulatory, and insolvency risks, but it does have a significant association with performance. This suggests that while the mere presence of a CRO may not directly impact the management of various risks, it does correlate negatively with organizational performance. This could indicate that CROs reduce senior managers ability to take risky decision with higher returns. The power of the CRO shows a positive and significant association with credit and regulatory risks but no significant

association with insolvency risk and performance. This implies that CROs with greater authority or influence are better able to manage credit and comply with regulations, highlighting the importance of their role in these specific areas. However, their power doesn't seem to translate effectively into managing the risk of insolvency or enhancing overall performance. Interestingly, CRO qualifications do not show a significant association with any of the risks or performance metrics considered. This might suggest that formal qualifications or specific educational backgrounds are not the primary drivers of effectiveness in the CRO role. Instead, other factors like experience, organizational support, or the specific context of the organization might play more critical roles. CRO tenure shows a mixed impact. There is a negative and significant association with both credit and regulatory risks, but no significant association with insolvency risk. However, it positively correlates with performance. This complexity may reflect the learning curve and growing influence of a CRO over time, where extended tenure helps in refining organizational strategies for better performance, though it might not necessarily reduce certain types of risks. The gender of the CRO, specifically being a female CRO, is significantly associated with insolvency risk but not with credit risk, regulatory risk, or performance. This singular significant association could indicate that gender might play a role in specific risk management areas, like insolvency risk, though the underlying reasons for this require further investigation.

These research findings could have profound implications for standards-setters and regulators in various ways. Given the evidence that the existence of a Risk Committee (RC) reduces credit risk, and a Chief Risk Officer (CRO) tenure correlates negatively with bank's credit risk, regulators may want to further enforce the establishment of these mechanisms in banks. They may also consider guidelines on the ideal size of an RC, and the specific qualifications desirable for RC members. The findings highlight the value of gender diversity in risk management, as female CROs seem to manage insolvency risk better. This could prompt regulators to advocate for more diverse gender representation in executive roles, especially within risk management. The study's indication that CROs with longer tenures manage risk more effectively could lead to regulatory encouragement for continuity in risk management leadership roles, thereby reducing frequent changes in these positions.

The research findings could also have thoughtful implications for banks in general and U.S. commercial banks specifically in many ways. The findings clearly underscore the importance of having a Risk Committee (RC) in managing credit risk. Banks might consider forming an RC voluntarily. Banks may also assess the size of their RCs, given that larger RCs appear to accommodate greater credit risk. The research indicates that more qualified RCs are associated with a proactive approach to risk management that leads to an acceptance of higher credit risk. Therefore, banks may want to ensure that their RCs are highly qualified and capable of managing and accepting higher credit risks. The findings highlight the positive

impact of a Chief Risk Officer (CRO) tenure on bank performance. Furthermore, the positive correlation between CRO tenure and risk management suggests that banks should strive to retain their CROs for longer periods. The research indicates that banks with female CROs demonstrate lower insolvency risk. Banks might want to consider this while making hiring decisions for the CRO and other high-ranking risk management positions. Finally, the study found that CROs with finance or accounting qualifications show no impact on bank's risk or performance. This insight can be beneficial when recruiting for the CRO position or for offering further education opportunities to current CROs.

Investors are key stakeholders who are likely to benefit from the findings of this research. The existence of a Risk Committee (RC) and a Chief Risk Officer (CRO) tenure are associated with lower risk and better bank performance, respectively. Investors might take these factors into account when assessing the governance of banks in which they consider investing. Investors can understand the risk profile of a bank better by considering the characteristics of its RC and CRO. For instance, larger RCs accommodate greater credit risk, and RCs with more qualifications accept higher credit risk. In addition, longer-tenured CROs seem to manage credit and regulatory risks more effectively. Investors can use these findings to evaluate the performance of a bank. The finding that several relationships, such as RC independence and risk measures, show insignificance might make investors more aware of bank's practices and underlying risk factors. The findings indicate that banks with female CROs exhibit lower insolvency risk and superior performance. This could lead investors to appreciate gender diversity in leadership roles as a factor contributing to a bank's performance and risk profile.

The research findings enhance the rare literature regarding risk governance in banks. It underscores the significance of an RC's existence in the reduction of credit risk, arguably the most consequential risk faced by commercial banks. However, the non-impact on regulatory or insolvency risks and performance metrics challenges prevailing assumptions about RCs' universal risk mitigation and performance enhancement role. This encourages further investigation into the efficacy of RCs in managing different types of risks and advancing performance. The positive correlation between RC size and credit risk opens a new dialogue on risk acceptance and risk management capabilities of larger committees. Moreover, the absence of a significant relationship between RC independence and risk or performance measures presents an opportunity for further academic exploration, focusing on the interaction between RC autonomy and its impact on a bank's risk and performance landscape. The study also reveals a fascinating connection between the qualifications of RC members and their acceptance of credit risk, suggesting a higher risk appetite in banks managed by highly qualified committees. The implications of this finding are substantial for academia, calling for additional research to elucidate the complexities around qualifications, risk appetite, and risk management. The study's focus on the role of CROs brings new insights into the gender

dynamics in risk management. The finding that banks with female CROs tend to have lower levels of insolvency risk stimulates further discussion about gender diversity in leadership roles and its impact on risk management. It also points towards the possibility of distinct risk management strategies adopted by male and female CROs. The study's focus on specific CRO attributes - presence, power, qualifications, tenure, and gender - and their relationships with risk and performance outcomes significantly enhances the understanding of the CRO's role. Particularly, the findings about CRO tenure having a negative relationship with credit and regulatory risks and a positive association with bank performance highlight the value of experience and continuity in this critical role. Overall, this study enriches risk governance literature by bringing attention to the multifaceted roles of RCs and CROs. It emphasizes the need for a differentiated approach to managing various risk types and offers valuable insights for improving risk governance practices within commercial banks. Its findings provide an impetus for further research, focusing on the interplay of various RC and CRO attributes and their impact on risk management and bank performance.

Keywords: Risk Governance, Risk Committee, Chief Risk Officer, Risk in Banks, and Banks' Performance.

Declaration

I declare that this thesis is the result of my own examinations and analysis, and was written by myself, except where otherwise stated. This research work has not previously been accepted for any degree and is not being concurrently submitted for any other degree.

Adnan Mahmoud Afaneh, June 2023

Acknowledgements

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List of Abbreviations

BCBS	Basel Committee for Banks Supervision
BHC	Bank Holding Companies
BOD	Board of Directors
CB	Conventional Banks
CEO	Chief Executive Officer
CRO	Chief Risk Officer
CRR	Capital Resources Requirement
CSR	Corporate Social Responsibility
EBA	European Banking Authority
EU	European Union
FCA	Financial Conduct Authority
FI	Financial Institutions
FSB	Financial Stability Board
FSF	Financial Stability Forum
IB	Islamic Banks
MENA	Middle East and North Africa
OECD	Organisation for Economic Cooperation and Development
RAS	Risk Appetite Statement
RC	Risk Committee
RGI	Risk Governance Index
ROA	Return on Assets
ROE	Return on Equity
RMI	Risk Management Index
SSEB	Significantly Supervised European Banks

Chapter One: Introduction

1.1 Introduction

Following the global financial crisis of 2007/2008, many regulators, academics, and investors attributed, the tragical unprecedented crisis to, among many other things, incompetent governance mechanisms. They stated that Financial Institutions (FIs) Boards were unable to manage and/or control risk (Kashyap, Rajan and Stein, 2008; Kirkpatrick, 2009; Bebchuk and Spamann, 2010).

Excessive risk taking and poor risk management were main areas of deficiencies in the FIs corporate governance (Erkens, Hung and Matos, 2012; Gupta, Krishnamurti and Tourani-Rad, 2013). And given the importance of the financial sector, regulators were very quick to act to address gaps/insufficiencies in FIs governance.

The Walker Review (2009) examined corporate governance in the UK banks and FIs. It recommended, among others, Banks and FIs should establish a board level standalone Risk Committee, separate from the Audit Committee to oversight and advice Board on current risk exposure and future risk strategy. The reports argued that risk management requires more time and resources that can't be provided by the already restrained Audit committee. The review also recommended the appointment of an independent Chief Risk Officer (CRO) who should report to the RC with direct access to the committee's chairman. The report believes that a risk champion within a bank setting is required to improve the overall risk management and oversight.

In the US, the Dodd-Frank Provisions regarding Risk Committee was introduced in 2010. Dodd-Frank requires an establishment of board level standalone Risk Committee for (1) Publicly traded nonbank financial companies supervised by the Board of Governors; and (2) Publicly traded bank holding companies, with total consolidated assets of greater than $10 billion (Dodd and Frank, 2010). This requirement has been made mandatory since the start of 2015.

Basel committee (2010) also supported the Walker Review (2009) and called for FIs to establish a separate Risk Committee at board level. Further, it also recommended that risk management function should be under and independent CRO who has sufficient resources and access to the board.

Seeking more adequate corporate governance in the financial sectors, regulators continued to provide further rules, regulations, and guidelines regarding risk governance in the sector. In 2016, the Financial Conduct Authority (FCA) stated that banks and insurance firms that are listed in FTSE 100 should appoint a CRO and establish a standalone RC (Financial Conduct Authority, 2016). In 2018, the FCA's new rules said that significant Capital Resources Requirement (CRR) firms (that includes most of UK listed banks and FIs) [1] must establish a separate Risk Committee composed of non-executive members who must possess appropriate skills, knowledge, and expertise to fully monitor the risk strategy and appetite of the firm (Financial Conduct Authority, 2018). The new rules did not provide similar "emphasis" for CRO appointment.

While the literature has covered corporate governance in FIs intensively following the financial crisis of 2008, there is limited work on empirically investigating the impact of RC and CRO characteristics on FIs risk taking and performance. This research will expand the current knowledge and understanding of the role and importance of RC's attribute and CRO's characteristics on FIs/Banks' risk and performance.

1.2 Research Questions

Motivated by the recent regulatory changes regarding risk governance in banks, this research will investigate the impact of Risk Committee attributes and CRO characteristics on the performance and risk of commercial banks in the USA. Specifically, it will address the following two broad questions:

- *What is the influence of standalone Risk Committee's attributes on US commercial banks' risk and performance?*
- *How do Chief Risk Officer's characteristics impact US commercial banks' risk and performance?*

This research extends the scarce empirical literature on risk governance in commercial banks post the implementation of the newly introduced rules and guidance period. The research will focus on the period from 2016 - 2019.

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[1] CRR firms include UK banks, building societies, and an investment firm that is a EU CRR.

1.3 Research Objectives

Following the 2007/2008 global financial crisis, regulators in the developed world explored ways to improve financial sector stability, including enhancing risk management function. The regulators introduced, among other measures, two risk governance requirements: to establish a board level standalone risk committee, and to appoint a chief risk officer. These requirements evolved and became mandatory for US banks with total assets exceeding $10 billion. Despite this agitation from regulators on the significance of these rules, empirical studies examining the impact of adhering to these rules on banks' risk and performance. This research aims to provide more insight and clarity on the relationship between the two mechanisms and the US commercial banks' risk and performance. Specifically, the research main objectives are:

First, address the research question "What is the influence of standalone Risk Committee's attributes on US commercial banks' risk and performance?" by providing more details about the impact of establishing a standalone RC on banks' risk and performance. Exploring the relationship between key RC characteristics, like size, independence, qualification, and number of meetings (activeness), on banks' performance and risk.

Secondly, explore the research question: "How do Chief Risk Officer's characteristics impact US commercial banks' risk and performance?" and reveal more insight on the importance of employing a chief risk officer, and the influence of CRO attributes, like presence, power or seniority, qualification, tenure, and gender on banks' performance and risk.

1.4 Motivation and Contribution

Stability of financial sector is key to the overall stability of the economy. This was further illustrated during the 2007/2008 global financial crisis which led the global economy to its worst recession for decades. Thus, research in risk governance in commercial banks, being the core bone of the financial sector, is significant for almost everyone. However, I identified four institutions or groups to be particularly interested in the findings of this research, namely: regulators, banks, investors, and academics.

By providing more insight about the significance of appointing a Chief Risk Officer (CRO) and establishing a board level stand-alone Risk Committee (RC), the research will assist regulators to determine how much emphasis to put on these two mechanisms going forward. While most research have focused on the impact of establishing a standalone RC and appointing a CRO, this research will also provide more details regarding the "desired" characteristics of RC and CRO that may improve the risk management and oversight in commercial banks leading to a

more stable financial sector and a reduced default probability. For countries that still did not introduce these requirements (establishing a standalone RC, and appointing a CRO), the research will provide more guidance and clarity on future direction for potential rules-adaptation regarding the two control mechanisms.

The research will benefit both (1) large banks (Assets > $10b), who are obliged to establish a standalone RC and appoint a CRO, and (2) small banks, whether they already have voluntarily adopted the new rules or not. Large banks will have more evidence regarding the benefits of establishing a board level standalone RC and appointing a CRO. More significantly, the research will improve the general understanding of the relationship between banks' risk and performance and the key characteristics of RC and CRO. This could lead to "designing" a more efficient standalone RC and appoint a more competent CRO. Small banks who have voluntarily adopted the rules will gain more insight and clarity whether to continue adhering to the rules. Also, they will have an enhanced view about the relationship between their risk and performance from one side and the characteristics of RC and CRO from the other side. For small banks that do not have a standalone RC and/or do not employ a CRO, this research will provide more evidence regarding the importance of implementing these two control instruments. In summary, the findings of this research will assist FIs in making decisions related to: (1) the structure and composition of their RC; (2) CRO compensation and reporting line; and (3) level of support and resources given to a CRO.

The research will assist investors to better understand risk governance and risk management in commercial banks and in financial institutions in general. It will also assist investors to determine the premium (discount) for investing in firms that do not (do) appoint a CRO and/or do not (do) establish a standalone RC. The results of this research may influence investors' selection criteria and risk assessment in the future. Further, the study can provide institutional investors more clarity regarding the impact of RC and CRO characteristics on commercial banks risk and performance.

This research makes many contributions to academia. Firstly, the thorough literature review highlights key findings in current scarce empirical literature and identifies significant literature gaps. Secondly, the study is the first research, to the best knowledge of the author, to investigate the period post rules-implementation for US commercial banks. Unlike earlier periods, this period is significant as it presents an era of well-established RCs, which facilitates a more robust results and findings. Thirdly. empirical literature on risk governance in commercial banks is limited with contradicting findings. Most of existing literature focus on the financial crisis period and on the importance of establishing a standalone RC with very few studies investigating the importance of RC key characteristics like size, independence, qualification, and activeness. Similarly, existing literature on CRO examines the significance of having a CRO with very few studies investigating the importance of CRO key characteristics

like seniority, qualification, and experience. Therefore, the study will extend the empirical literature on corporate governance in commercial banks providing more emphasis on the role of two of the most important, from the regulators' perspective, risk governance mechanisms: board level risk committee and the chief risk officer.

1.5 Thesis Structure

This chapter provides details regarding research objectives, questions, motivation, and contribution. Chapter Two explains corporate governance definition, theories, mechanisms, and systems. The chapter concludes with exploring the development of corporate governance for Banks with more emphasis on risk governance mechanisms. Chapter Three investigates the empirical relationship between standalone risk committee characteristics from one side and the risk and performance of US commercial banks on the other side. Chapter Four examines the impact of chief risk officer attributes on US commercial banks' risk and performance. Results and Limitations will be discussed in Chapter Five, in addition to highlighting potential future research.

Chapter Two: Corporate Governance and Financial Institutions

2.1 Corporate Governance Definition

Corporate governance definitions can vary widely. However, they tend to fall into three main categories. The first group of definitions focuses on the protection of shareholder's interests. These interests are, in many cases, severely neglected by managers' decisions and behaviour. Definitions that belong to this category are based on the agency theory. The second category contains definitions that take a broader view than the first group. Definitions in this group focus not only on the interest of shareholders but the welfare and interest of all stakeholders. The last set of definitions includes different views and opinions regarding defining corporate governance. Where some definitions focus on the way firms are directed and controlled (Cadbury, 1992), others highlight the need to protect minority shareholders from managers and controlling shareholders (Mitton, 2002).

Hussey (1999) declared that corporate governance is the manner in which organizations are managed and the nature of accountability of the managers to the owners. In the same contents, Mayer (1997) stated that corporate governance is concerned with ways of bringing the interests of investors and managers into line and ensuring that firms are run for the benefit of investors. These definitions share similar principle. That corporate governance objective is primary about "forcing" managers to act and behave in the best interest of owners. However, other scholars argue that the benefit of all stakeholders should be considered when defining corporate governance.

According to Demb and Neubauer (1992, p. 9) "Corporate Governance is the process by which corporations are made responsive to the rights and wishes of stakeholders". Similarly, Tirole (2001) described corporate governance as "the design of institutions that induce or force management to internalise the welfare of stakeholders". Solomon (2004, p. 14) proposed a more comprehensive definition that "'corporate governance is the system of checks and balances, both internal and external to companies, which ensures that companies discharge their accountability to all their stakeholders and act in a socially responsible way in all areas of their business activity". Banks (2004, p. 3) introduced a more "balanced" definition, where he defined corporate governance as "the structure and function of a corporation in relation to its stakeholders generally, and its shareholders specifically".

Definitions in the last group vary. Some scholars focus on the function and participants of corporate governance. Monks and Minow (2011, p. 442) describes corporate governance as the "relationship among various participants in determining the direction and performance of corporations". The main participants are board of directors, management, and shareholders.

More definitions were introduced by several institutions and organizations. According to Organisation of Economic and Cooperation Development (OECD) (1999, p. 4) "Corporate governance is the system by which business corporations are directed and controlled. And by specifying the distribution of rights and responsibilities among the different participants to the corporation the corporate governance framework comprise elements that are essential for a successful outcome at all stages in the investment process."

2.2 Corporate Governance Main Theories

2.2.1 Agency Theory

Modern firms are owned by large number of owners but controlled by few numbers of executive managers. Owners/investors seek to maximize their wealth by maximizing share value. Therefore, they want managerial decisions that improve firm's resources utilization. Moreover, owners/investors are interested in projects that positively impact their overall target (maximizing share value). Managers, on the other hand, may have their own goals and objectives, which may not necessarily be consistent with the share value maximizing objective. This conflict of interest between the shareholders' (principals) interests and managers' (agents) interests establishes the foundation of the Agency Theory (Berle and Means, 1982).

Significant amount of research on corporate governance were directed towards answering this question: How can corporate governance mechanisms reduce (minimize) agency costs? Berle and Means (1932) initiated this topic. They argued that separation of ownership and control causes principal-agent problem. To better understand this conflict, one needs to clarify two important issues. First, what are the shareholders' interests and how do they differ to those of managers? Second, what is the cost of reducing the principal-agency problem?

Shareholders' aim to maximize their wealth; minimize the probability of corporate default; and ensure the availability of adequate, reliable, complete, and timely information, about their firm (investment). On the other hand, managers seek maximizing their own wealth. To do that, they may engage in self-interest behaviours. The literature provides many examples of the conflict of interest between managers and owners. Some of these examples are excessive perquisite

consumption (Jensen and Meckling, 1976); conflict over managers' compensation packages (Jensen and Murphy, 1990); empire-building, through pursuing negative net present value projects (Shleifer and Vishny, 1997); resistance to value-increasing takeovers (Walking and Long, 1984).

Therefore, firms incur some costs (agency costs) to align the interests of managers and shareholders. Agency costs, as defined by Jensen and Meckling (1976), encompass the combined expenses of monitoring by the principal, the agent's efforts to assure their commitment, and any remaining losses. Where monitoring cost includes external auditing cost and cost of having independent board members. Bonding cost include agents owning a larger than desired equity stake and adopting a riskier compensation package. Jensen and Meckling (1976) characterized residual loss as the monetary value representing the decline in the principal's well-being due to differences between the agent's actions and those that would optimize the principal's welfare.

The theory offers an incisive elucidation of potential conflicts that are inherent in organizations, especially those that have a vast and dispersed shareholder base where there exists a distinct delineation between ownership and management. It has been instrumental in shaping various mechanisms and tools within the corporate governance landscape. Notably, performance-tethered remuneration is one such mechanism that aims to synchronize the interests of management with those of the shareholders. Furthermore, Agency Theory underscores the vigilant oversight of agents and thereby validates the critical roles that internal and external auditing bodies, along with independent directors, play in ensuring robust corporate governance. An essential facet of this theory is its emphasis on meticulously crafted contracts, asserting that they serve as potent tools to ensure that the actions of agents are closely aligned with the aspirations and interests of principals.

However, while the theory's contributions are significant, it does come with its set of limitations. A foundational premise, and perhaps an oversimplified one, is its unwavering focus on the self-interest of agents. This assumption, although occasionally accurate, may overshadow instances where managerial decisions, even if they deviate from immediate personal gain, are in alignment with the broader objectives of the organization. The theory also places a disproportionate emphasis on the costs associated with monitoring, which might inadvertently lead to an environment that curtails innovation and creativity due to undue surveillance. Furthermore, its analytical scope predominantly zeroes in on the interactions between shareholders and managers, potentially neglecting the broader spectrum of stakeholders that contemporary corporations have. This spectrum includes employees, clients, and broader societal entities, all of whom significantly influence organizational trajectories. An additional

concern arises from the theory's potential to inadvertently promote myopic strategies by closely aligning managerial incentives with immediate shareholder returns, potentially sidelining long-term organizational resilience. Lastly, one must question the universal applicability of Agency Theory's assumptions, especially when transposed onto diverse cultural matrices where fiduciary and moral responsibilities might overshadow purely economic motivations.

In conclusion, while Agency Theory's contributions to the lexicon of corporate governance are invaluable, its limitations within the complex and ever-evolving landscape of modern business are evident. The contemporary corporate governance landscape demands an integrative approach, one that seamlessly weaves insights from Agency Theory with a plethora of academic postulations and pragmatic observations, to sculpt a governance framework that is both robust and adaptable to the dynamism inherent in the corporate world.

2.2.2 Resource Dependence Theory

In the realm of corporate governance, understanding the factors that influence organizational behaviour is crucial for the development of effective management strategies. One theoretical perspective that has gained prominence in this context is the resource dependence theory. Originally proposed by Pfeffer and Salancik (1978), the resource dependence theory posits that organizations are inherently dependent on their external environment for resources, which influences their behaviour and decision-making processes. The resource dependence theory is grounded in the idea that organizations require resources to function and survive, and these resources are often controlled by external actors (Pfeffer and Salancik, 1978). As such, organizations must establish relationships with external stakeholders, such as suppliers, customers, and regulatory bodies, to secure the necessary resources and mitigate potential risks (Hillman et al., 2009).

According to Pfeffer and Salancik (1978), organizations are likely to engage in various strategies to reduce their dependence on external resources and increase the dependence of other actors on their own resources. These strategies may include diversification, mergers and acquisitions, and the establishment of alliances or partnerships (Pfeffer and Salancik, 1978; Hillman et al., 2009). Furthermore, the resource dependence theory suggests that organizations will attempt to influence their external environment and the allocation of resources through actions such as lobbying, advocacy, and the appointment of key individuals to their boards of directors (Pfeffer, 1972; Hillman et al., 2009).

Resource dependence theory offers several benefits as a lens through which to analyse corporate governance. Firstly, it provides a valuable framework for understanding the complex interdependencies between organizations and their external stakeholders (Pfeffer and Salancik, 1978). This can help organizations identify potential vulnerabilities and opportunities in their relationships with external actors and develop strategies to manage these dependencies effectively (Hillman et al., 2009). Secondly, resource dependence theory highlights the role of boards of directors in managing external dependencies and securing resources for the organization (Hillman and Dalziel, 2003). This perspective emphasizes the importance of selecting board members with diverse backgrounds, skills, and connections, which can enhance the organization's ability to navigate the external environment and access critical resources (Hillman et al., 2000).

However, the resource dependence theory also faces some limitations. Critics argue that the theory is overly deterministic, implying that organizations are solely driven by their external dependencies and have little agency in shaping their own behaviour (Oliver, 1991). This criticism suggests the need to consider other theoretical perspectives, such as institutional theory and the resource-based view, to develop a more comprehensive understanding of corporate governance and decision-making processes (Oliver, 1991; Barney, 1991). Additionally, the resource dependence theory has been criticized for its lack of specificity regarding the mechanisms through which organizations manage their dependencies (Davis and Cobb, 2010). To address this limitation, future research should explore the various strategies and tactics employed by organizations to mitigate resource dependencies and their impact on corporate governance outcomes.

The resource dependence theory has important implications for corporate governance practices and policymaking. Organizations must recognize the significance of their external dependencies and adopt strategies to manage these relationships effectively. This may involve building a diverse and well-connected board of directors, engaging in strategic alliances or partnerships, and actively participating in industry associations or lobbying efforts (Hillman and Dalziel, 2003). For policymakers and regulators, understanding the dynamics of resource dependence can help inform the development of regulations and guidelines that promote effective corporate governance. For example, encouraging transparency and disclosure regarding organizational dependencies and board composition can empower shareholders and other stakeholders to make informed decisions and hold organizations accountable for their actions (Hillman et al., 2009).

The resource dependence theory offers valuable insights into the dynamics of corporate governance and the relationships between organizations and their external stakeholders.

Despite its limitations, the theory provides a useful framework for understanding the factors that influence organizational behaviour and decision-making processes. By considering the implications of resource dependence theory in corporate governance, organizations can develop strategies to effectively manage their relationships with external stakeholders and mitigate potential risks. Additionally, regulators and policymakers can use this perspective to design policies that promote transparency, accountability, and effective governance. However, it is important to acknowledge the need for a multi-theoretical approach in order to develop a more comprehensive understanding of corporate governance and organizational behaviour.

2.3 Corporate Governance Models

The market economies today follow one of two different corporate governance systems which are market-based system and group-based system (Carati and Rad, 2000). The difference between these systems is due to different regulatory, institutional, and political environment and cultural values. According to Franks and Mayer (1994) the differences in corporate governance models between countries do not occur because of the way in which financial systems are used to fund the companies, but rather because of the way in which ownership and control are organized.

2.3.1 Shareholder Centric Models

The market-based system has been adopted by the United States and Britain which is also known as shareholder centric system, while the group-based system, followed by other countries, is known as stakeholder centric system. As the names suggest, each system is designed to provide maximum protection to a specific group (s), i.e., the shareholders in the first model, and the wider stakeholders in the second. The reason behind these terminologies will be shortly revealed as each country's governance system is studied in detail.

United States

Given the significant amount of regulation and academic search on board of directors, it is considered the most important corporate governance mechanism in the United States. This board has the responsibility to ensure that the management of publicly traded companies acts in the interest of shareholders. Among the core functions of this board are to appoint the CEO of the company, nominate other directors, evaluate, and review the company's strategy, and to review the financial statements of the company. The structure of the board of directors in United States is typically composed of executive and non-executive members, where non-

executives are further classified as independent and dependent; independent composing those who would not be affected in case of any profit or loss that the company makes (Kluyver, 2009). Executive directors are limited in the committees they serve according to the governance laws, and thus majority of directors in US are non-executive. Typically, the founder or family member who retained a significant ownership position in the company also serve on the board. Some board committees are mandatory in this system (usually known as standing committees). These are audit committee, nominating committee, governance committee, and risk committee. All these standing committees must have at least three independent members. Apart from these standing committees, the board is also allowed to make additional teams as per the nature, size, and complexity of the company. This might include external affairs committee, strategy committee, and Corporate Social Responsibility (CSR) committee.

In the late 20th century, several high-profile corporate scandals (such as those involving Enron and WorldCom) led to a renewed focus on corporate governance. In response to these scandals, Congress passed the Sarbanes-Oxley Act in 2002, which introduced major changes to the regulation of corporate governance and financial practice. The Act increased penalties for destroying, altering, or fabricating financial records and for attempts to defraud shareholders. In the aftermath of the 2008 financial crisis, the Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into law in 2010. This law made significant changes to financial regulation and corporate governance in the United States, including introducing the "say on pay" vote, which gives shareholders a non-binding vote on executive remuneration. Moreover, corporate governance in the U.S. has started to move beyond just shareholder interests. The rise of ESG (environmental, social, and governance) investing and the concept of stakeholder capitalism have broadened the scope of corporate governance. This has led to increased focus on issues like climate change, diversity and inclusion, and corporate social responsibility.

CEO in this system is typically a professional manager and separate from the board. He/she is hired by the board and guided by them to manage the operations of the company as planned by the board. Typically, the CEO maintains quite an influence over the board of directors in Anglo-Saxon model. This influence may explain the generous CEO's compensation in the US, according to one study posted by CBC News, US CEOs are incredibly overpaid as compared to their peers in other countries, for example CEO pay ratios were 1-11 in comparison with Japan, while 1-22 in comparison with Britain[2]. One major event in the corporate governance model of US worth mentioning is the Sarbanes-Oxley act which was passed after the Enron scandal with the purpose of curbing fraud and increasing accountability with addition layers of governance (Kulp and Lane, 2006).

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[2]http://www.cbc.ca/news/story/2009/11/04/consumer-ceo-pay.html

United Kingdom

The corporate governance model of United Kingdom shares many similarities with that of United States since it is also shareholder centric and part of the Anglo-Saxon model. The model being practiced in the UK today is inspired by the points of Cadbury Committee's code of best practices (Cadbury, 1992) and Higgs report (Higgs, 2003). The major points of the two reports are summarized below.

Code of Best Practices (Cadbury Committee, 1992):
- Separation of chairman of the board and CEO of the company.
- Inclusion of independent directors in the board.
- Independent audit committee.
- Review of the effectiveness of company's internal controls.

Higgs' Report (2003):
- At least half of the members in the board of directors should be non-executive.
- Nomination committee should be headed by non-executive director.
- Executive director should serve not more than a six-year term.

Although separation of Chairman and CEO did not become part of the governance policy in the UK, Kluyver, (2009) reveals that about 95% of all Financial Times Stock Exchange 250 companies support this point as opposed to one-third of US companies. Further, it was observed that the director independence was more popular in US where 10 of 12 directors were non-executive on average as compared to half in the UK.

2.3.2 Stakeholder Centric Models

Ooghe and Langhe (2002) compared the shareholder centric model of Anglo-Saxon with the stakeholder model. They observed that one major difference between the two models is that in the former, the concentration of shareholders is quite low, while in the latter a few groups hold a large percentage of total shares of the company. Hence, due to their low concentration in Anglo-American countries, shareholders' do not have much power, and management itself decides the strategy and how to tackle problems faced by the company. While on the other hand, in the Continental European model a few shareholders who hold large percentage of the company's ownership can dictate terms and control the operations of the company. Hence, in the Anglo-Saxon model, the decisions are in favour of the management while in the Continental European model, they are skewed in favour of stakeholders. Two such stakeholder-centric models are of Germany and Japan which are discussed below.

Germany

Under the corporate governance model of Germany, the board structure is two-tiered. The first one called Vorstand or management part, which oversees management functions and day-to-day activities. While the other called Aufischsrat or supervisory board and looks after the management board and takes strategic decisions. Executive members are allowed only on management board while the supervisory board is required to have one-third to half of its members as labour representatives depending upon the size of the company. One clear difference between the governance laws of Germany and those of US and UK is that these laws are legal obligations and part of legislation unlike bylaws. Also, the representation on the board is typically dominated by founding families, banks, labour unions, and other financial institutions. Therefore, the public shareholders have relatively far less power over board matters (Seibt and Kulenkamp, 2022).

Japan

The corporate governance model of Japan was reshaped after World War II when zaibatsu (The term zaibatsu was used in the 19th century to refer to large family-controlled banking and industrial companies in Japan[3]) were banned by the military. The new system, known as Keiretsu, was formed under which all major players of the supply chain of a company maintained its small ownership. This unique model enabled the companies to work in collaboration. This model shared certain similarities with that of Germany where financiers also had a stake in the company and board of directors were usually internal.

In 2003 however, a law was passed in Japan which allowed two corporate governance systems to operate concurrently in the same corporate domain where the other governance model was shareholder centric (Anglo-Saxon model). Eberhart (2012) conducted a study where he found that the companies which had adopted the alternative model showed significant increase in firm value and reduction in agency cost.

2.4 Corporate Governance Mechanisms

The literature shows that there are many conflicts within organizations. In addition to conflict between managers' interests and shareholders' interests (the most researched one); there is another conflict between shareholders' interests and the interest of stakeholders. As a result, the need for mechanisms that control and minimize the cost of these conflicts has risen. In

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[3]http://are.berkeley.edu/~sberto/Zaibatsu.pdf

general, corporate governance mechanisms, regardless of the system that is adopting it, can be classified into two groups: external mechanisms and internal mechanisms.

2.4.1 External Corporate Governance Mechanisms

The most researched external corporate governance mechanisms are:

i.   Takeover Threat

The concept of takeover threat is a key factor that influences corporate governance dynamics. Takeover threat refers to the possibility that a firm may be acquired by another firm, which can influence managerial behaviour and decision-making by imposing the threat of dismissal.

Takeover threat is a mechanism that imposes discipline and accountability on managers by creating the possibility of dismissal in the event of poor performance or managerial opportunism. This threat can be initiated by shareholders, who can acquire a significant stake in the firm and use it to force changes in management or sell the firm to another entity (Jensen, 1986). Alternatively, the threat can be initiated by external parties, such as activist investors or potential acquirers. Takeover threat is based on the assumption that managerial opportunism and agency costs are more likely when managers face weak or absent external discipline mechanisms. In this context, takeover threat can provide a valuable external mechanism that imposes accountability and discipline on managers, incentivizing them to pursue long-term value creation (Shleifer and Vishny, 1986).

Takeover threat can serve as an effective corporate governance mechanism, promoting accountability, discipline, and long-term value creation. It can help prevent managerial opportunism and agency costs by imposing the threat of dismissal in the event of poor performance or unethical behaviour. This threat can also encourage managers to pursue long-term value creation by aligning their interests with those of shareholders.

However, takeover threat also faces several limitations. One criticism is that it may create short-termism and discourage investment in long-term projects, as managers seek to maximize short-term profits to avoid being targeted for acquisition (Bebchuk, 2002). This suggests that takeover threat should be balanced with other governance mechanisms that promote long-term value creation, such as performance-based compensation, risk management, and strategic planning. Another limitation is that takeover threat may lead to the loss of valuable organizational knowledge and culture in the event of a merger or acquisition.

This suggests that firms should carefully consider the potential costs and benefits of takeover threat before implementing it as a governance mechanism.

Takeover threat has important implications for corporate governance practices. It can serve as an effective mechanism for promoting accountability, discipline, and long-term value creation. To optimize the benefits of takeover threat, firms should carefully consider the potential costs and benefits of this mechanism, balancing it with other governance mechanisms that promote long-term value creation and organizational stability.

Takeover threat is a valuable mechanism for promoting accountability, discipline, and long-term value creation in corporate governance. By considering the implications of takeover threat in corporate governance, organizations can develop more tailored and effective governance mechanisms that foster transparency, accountability, and long-term value creation. However, it is important to recognize the limitations of takeover threat and consider complementary theoretical perspectives in order to develop a more comprehensive understanding of corporate governance dynamics.

Shareholder activism has increasingly become a significant force influencing the management of publicly traded companies. It is a process by which shareholders utilise their equity stake to influence the company's behaviour, policies, or corporate governance (Goranova and Ryan, 2014). Shareholder activism manifests in various forms such as proxy fights, shareholder proposals, and litigation. Investors engage in such actions with the ultimate goal of enhancing shareholder value. Shareholder activists often target firms with apparent management inefficiencies, poor financial performance, or controversial corporate social responsibility (CSR) practices (Brav et al., 2008). Activist shareholders can play a critical role in corporate governance. They often act as a check on managerial power, holding the management accountable for their decisions (Yermack, 2010). These activist shareholders help mitigate the agency problem by aligning the interests of the management with the shareholders (Jensen and Meckling, 1976). Their activities may thus result in improved operational efficiency and financial performance (Cziraki, Renneboog, and Szilagyi, 2010). Shareholder activism can also trigger improvements in CSR practices, promoting more sustainable and ethical business practices. Several studies suggest that activist shareholders can push companies towards better environmental, social, and governance (ESG) performance (Reid and Toffel, 2009; Gond and Piani, 2013). However, shareholder activism also has its critics. Some argue that it may lead to short-termism, prioritising immediate returns over long-term sustainable growth (Bebchuk, Brav, and Jiang, 2015). It is also suggested that shareholder activism can distract management from core business functions, negatively affecting the overall company's performance (Clifford, 2008).

ii. Managerial Labour Market and Mutual Monitoring by Managers

The concept of managerial labour market and mutual monitoring by managers are two key factors that influence corporate governance dynamics. Managerial labour market refers to the competition for managerial talent and the external factors that affect it. Mutual monitoring by managers, on the other hand, involves the surveillance and evaluation of managerial peers, influencing managerial behaviour and decision-making.

The managerial labour market refers to the competition for managerial talent, which is influenced by various external factors, such as economic conditions, industry trends, and regulatory changes (Finkelstein and Hambrick, 1989). The concept highlights the importance of external factors in shaping corporate governance dynamics, as managers seek to maximize their career prospects and compensation by moving between firms.

Managerial labour market theory suggests that the competition for managerial talent can create pressure for firms to adopt more shareholder-friendly policies, such as greater accountability, transparency, and performance-based compensation (Demsetz and Lehn, 1985). This competition also implies that managerial talent is a scarce resource, and firms may need to compete to attract and retain the best managers.

Mutual monitoring by managers refers to the surveillance and evaluation of managerial peers, which can influence managerial behaviour and decision-making. This concept suggests that managers are not only accountable to their superiors but also to their peers, who can provide feedback and evaluation on their performance (Lorsch and MacIver, 1989). Mutual monitoring by managers can promote collaboration, information-sharing, and accountability within organizations, as managers are incentivized to monitor and report on the actions of their peers (Fama and Jensen, 1983). This can help prevent managerial opportunism and promote ethical behaviour, as managers are aware that their actions will be subject to scrutiny by their peers.

Managerial labour market and mutual monitoring by managers are important components of effective corporate governance. Managerial labour market theory highlights the importance of external factors in shaping corporate governance dynamics, encouraging firms to adopt more shareholder-friendly policies. Mutual monitoring by managers can promote accountability, collaboration, and ethical behaviour, by incentivizing managers to monitor and report on the actions of their peers.

However, both concepts also face several limitations. One criticism of managerial labour market theory is that it may overemphasize the importance of external factors, downplaying the role of internal factors, such as organizational culture and values (Lounsbury and Glynn, 2001). This suggests that a more balanced approach, which considers both external and internal factors, may be more appropriate in understanding corporate governance dynamics. Another limitation of mutual monitoring by managers is that it may create incentives for managers to engage in rent-seeking behaviour, such as focusing on short-term performance rather than long-term value creation (Lorsch and MacIver, 1989). This suggests that firms need to carefully balance the benefits of mutual monitoring with the potential costs of managerial opportunism.

Managerial labour market and mutual monitoring by managers have important implications for corporate governance practices. For example, the competition for managerial talent implied by the managerial labour market suggests that firms need to adopt more shareholder-friendly policies to attract and retain top talent. This may involve adopting greater transparency, accountability, and performance-based compensation policies.

Mutual monitoring by managers, on the other hand, highlights the importance of fostering a culture of collaboration, information-sharing, and ethical behaviour within organizations. This may involve promoting accountability and feedback mechanisms among managers, providing incentives for cooperation and knowledge-sharing, and promoting ethical values and norms.

The managerial labour market and mutual monitoring by managers are two essential components of effective corporate governance, influencing managerial behaviour and decision-making. By considering the implications of these concepts in corporate governance, organizations can develop more tailored and effective governance mechanisms that promote transparency, accountability, and collaboration. However, it is important to recognize the limitations of these concepts and consider complementary theoretical perspectives in order to develop a more comprehensive understanding of corporate governance dynamics.

iii. Product Market Competition

The concept of product market competition is a key factor that influences corporate governance dynamics. Product market competition refers to the level of competition that a firm face in its industry, which can influence managerial behaviour and decision-making by imposing pressure to innovate and improve efficiency.

Product market competition is a mechanism that imposes discipline and accountability on managers by creating pressure to innovate and improve efficiency. This pressure is exerted by the market forces of supply and demand, as firms compete for customers and market share. Product market competition can also influence corporate behaviour by encouraging firms to invest in research and development, improve production processes, and enhance customer service (Porter, 1980). Product market competition assumes that firms are more likely to engage in rent-seeking behaviour and opportunism when they face weak or absent external discipline mechanisms. In this context, product market competition can provide a valuable external mechanism that imposes accountability and discipline on managers, incentivizing them to pursue long-term value creation (Baron, 2001).

Product market competition can serve as an effective corporate governance mechanism, promoting innovation, efficiency, and long-term value creation. It can help prevent managerial opportunism and agency costs by imposing discipline and accountability on managers, incentivizing them to pursue long-term value creation. Product market competition can also encourage firms to invest in research and development, improve production processes, and enhance customer service.

However, product market competition also faces several limitations. One criticism is that it may create barriers to entry and discourage competition in certain industries, leading to market concentration and reduced consumer welfare (Gabaix and Laibson, 2006). This suggests that product market competition should be balanced with other governance mechanisms that promote market competition and prevent market concentration. Another limitation is that product market competition may lead to a focus on short-term profits rather than long-term value creation. This suggests that firms need to carefully balance the benefits of product market competition with the potential costs of short-termism, such as reduced investment in research and development.

Product market competition has important implications for corporate governance practices. It can serve as an effective mechanism for promoting innovation, efficiency, and long-term value creation. To optimize the benefits of product market competition, firms should carefully consider the potential costs and benefits of this mechanism, balancing it with other governance mechanisms that promote long-term value creation and market competition.

In summary, product market competition is a valuable mechanism for promoting innovation, efficiency, and long-term value creation in corporate governance. By considering the implications of product market competition in corporate governance, organizations can develop more tailored and effective governance mechanisms that foster innovation, efficiency,

and long-term value creation. However, it is important to recognize the limitations of product market competition and consider complementary theoretical perspectives in order to develop a more comprehensive understanding of corporate governance dynamics.

There are other external corporate governance mechanisms that one needs to highlight. The **market for corporate control** serves as an effective mechanism to discipline management. Poorly performing firms become targets of better-performing firms, which may acquire them and replace the inefficient management (Jensen, 1988). This threat of takeovers can drive managers to work in the best interest of the shareholders (Franks and Mayer, 1996). **Regulatory oversight** by government agencies or regulatory bodies is another pivotal external corporate governance mechanism. Agencies such as the U.S. Securities and Exchange Commission (SEC) enforce rules and regulations to ensure that firms act responsibly and honestly (Coffee, 2006). The role of external **auditor oversight** is critical in ensuring the reliability of the financial reporting process. Independent audits can help in identifying fraudulent accounting practices, hence ensuring management accountability (DeFond and Zhang, 2014; Cohen, Krishnamoorthy and Wright, 2004).

Analyst coverage also plays a significant role in corporate governance. Financial analysts scrutinize a company's performance and issue recommendations. Their evaluations can influence market perception and drive management to prioritize profitability and growth (Bradshaw, 2011). Lastly, the **media and public opinion** can significantly shape corporate governance. Public opinion and media coverage can pressure companies to behave responsibly, promoting ethical and sustainable business practices (Dyck and Zingales, 2002). In conclusion, external corporate governance mechanisms are fundamental to ensuring the effective functioning of corporations. They hold the power to ensure the alignment of interests between the management and the shareholders and promote ethical and responsible business practices.

2.4.2 Internal Corporate Governance Mechanisms

i.   Board of Directors (BOD)

The UK's 2018 corporate governance code, as presented by the Financial Reporting Council (2018), states that the Boards of Directors hold the accountability for overseeing the governance of their respective companies. Given its responsibilities in monitoring, controlling, and managing company's activities, BOD receives significant attention from academics, regulators, and participants as it is one of the most researched corporate governance

mechanisms in the literature. Impact of BOD attributes, like size, independence, committees, and multiple directorships, on companies' performance and risk is studied intensively in the corporate governance literature. The literature reveals mixed results when it comes to examining the relationship between firm performance and board attributes.

Board Independence

Boards of directors consist of two types of members: (1) executive directors, full time employees who bring speciality to the firm benefit; (2) Non-executive directors, responsible for monitoring CEO and executive directors decisions (Cadbury, 1992) to ensure that the benefit of the shareholder is pursued. Board independence (where number of non-executive directors exceeds the number of executive ones) effect on firm performance have been subject to intensive research.

Agency Theory (Jensen and Meckling, 1976) suggests that independent directors can enhance corporate governance by mitigating agency problems between shareholders and management. Independent directors are less likely to have conflicts of interest, enabling them to effectively monitor management and ensure that their decisions align with shareholders' interests (Fama and Jensen, 1983). Conversely, Resource Dependence Theory (Pfeffer and Salancik, 1978) posits that the presence of independent directors may limit a board's access to essential resources, such as information and expertise, which can negatively impact decision-making.

Some studies have found a positive association between board independence and bank performance. For instance, Pathan and Faff (2013) analysed a sample of Australian banks and found that a higher proportion of independent directors was associated with improved bank performance. Similarly, Erkens et al. (2012) reported that banks with more independent boards performed better during the global financial crisis, suggesting that board independence can contribute to better risk management and resilience.

In contrast, other studies have found a negative or insignificant relationship between board independence and bank performance. Minton et al. (2014) examined a sample of US banks and found that greater board independence was associated with lower bank performance, particularly during periods of financial stress. This finding supports the argument that independent directors may lack the industry-specific knowledge and expertise necessary for effective decision-making in the banking sector. Meanwhile, Adams and Mehran (2012) reported an insignificant relationship between board independence and bank performance for a sample of US banks.

The relationship between board independence and bank performance may be influenced by factors such as bank size, complexity, and the regulatory environment. For example, larger and more complex banks may require more extensive monitoring and oversight, which could be facilitated by a higher proportion of independent directors (Pathan and Faff, 2013). Additionally, stricter regulations and higher levels of regulatory scrutiny might increase the importance of board independence for ensuring compliance and effective risk management (Erkens et al., 2012).

Board Size

Lipton and Lorsch (1992) and Jensen (1993) reckon that the optimal board size is 7 - 8 members. They argue that smaller boards lack the necessary resources and capabilities, while members of larger boards become more polite and less frank, and this undermine their controlling role. Since the publishing of their work, the literature has been divided regarding the board size, where some academics are in favour of larger boards, and others favouring smaller boards.

A larger board can monitor managerial actions more effectively since it has greater resources and expertise (Upadhyay and Sriram, 2011). Further, larger boards can form multiple monitoring committees, leading to better information transparency (Klein, 2002; and Anderson et al. 2004). Also, firms with larger board can benefit from a wider range of connections and views (Peng and Luo, 2000). In contrast, some academics argue that a board size will increase to a certain number, after which the effectiveness of the board will diminish, impacting the functioning of the board negatively (Jensen, 1993; Lipton and Lorsch, 1992; Yermack, 1996; Eisenberg et al. 1998; and de Andres et al. 2005). Further, they suggest that larger boards are: (1) easier, for CEO, to control, (2) affect firm valuation negatively, (3) communication among its members is time consuming.

The banking sector presents a unique context for examining the relationship between board size and firm performance, as banks are subject to strict regulations and face different risks compared to non-financial firms. This section reviews the existing empirical evidence on the relationship between board size and bank performance.

Some studies have found a positive association between larger boards and improved bank performance. For example, Adams and Mehran (2012) analysed a sample of US banks and found that larger boards were associated with higher performance, particularly for complex banking institutions. This finding supports the notion that larger boards can provide more diverse resources and expertise, which can enhance decision-making and oversight in the

complex and highly regulated banking environment. Similarly, Pathan (2009) examined the relationship between board size and bank performance for a sample of Australian banks and found that larger boards were associated with higher performance. This study suggested that larger boards can contribute to better risk management and compliance with regulatory requirements in the banking sector.

In contrast, other studies have reported a negative or insignificant relationship between board size and bank performance. For instance, Belkhir (2009) analysed a sample of US banks and found that larger boards were associated with lower performance, particularly for smaller banks. This study argued that the potential benefits of larger boards may be outweighed by the coordination and communication problems that can arise in larger groups. Andres and Vallelado (2008) investigated the relationship between board size and bank performance for a sample of European banks and found no significant relationship between the two variables. This study suggested that the impact of board size on bank performance might depend on other factors such as board composition, bank size, and the regulatory environment.

Several studies have highlighted factors that may moderate the relationship between board size and bank performance. For example, bank size and complexity have been identified as potential moderators, with larger and more complex banks potentially benefiting more from larger boards (Adams and Mehran, 2012). This is because larger banks typically face more complex operations and risks, which may require diverse resources and expertise that larger boards can provide. In addition, the regulatory environment may play a role in shaping the relationship between board size and bank performance. For instance, stricter regulations and higher levels of regulatory scrutiny might increase the importance of board oversight, leading to a stronger positive association between board size and bank performance (Pathan, 2009).

To summarize, the empirical evidence on the relationship between board size and bank performance presents a mixed picture, with some studies reporting a positive association and others finding a negative or insignificant relationship. These inconsistencies may be attributed to differences in the samples, time periods, and methodologies used in the various studies. Moreover, factors such as bank size, complexity, and the regulatory environment might moderate the relationship between board size and bank performance. Future research should continue to explore these moderating factors and investigate the potential impact of other aspects of board composition, such as board independence and diversity, on the performance of banks.

Multiple Directorships

Agency theorists suggest that busy board members will be less effective in monitoring the executives' performances (Ferris et al., 2003) as they will have lesser time and energy to devote for every firm (Conyon and Read, 2006; and Fich and Shivdasani, 2006). This view was initially developed by the work of Ferris et al. (2003) in what is known as the busyness hypothesis. The theory is not supported by the empirical study of Ferris et al. (2003); however, it was verified empirically by Fich and Shivdasani (2006). Further, Jackling and Johl (2009) found that multiple directorships-firm performance relationship is negative in some Indian firms.

In contrast, resource dependence theorists reckon that busy directors are assets to their firms. Serving in multiple boards will increase directors outside connections (Ghosh, 2007), and enhance their expertise (Carpenter and Westphal, 2001). Relatedly, Fama and Jensen (1983) initiated the reputation hypothesis; they suggest that only talented well-reputed directors will be offered the chance to serve in multiple boards. The multiple directorship-firm performance positive relation is supported by some empirical studies (Harris and Shimizu 2004; Miwa and Ramseyer, 2000; and Lu et al. 2013).

Board Committees

ii.   Ownership Structure

Family, institutional, managerial, governmental, employee, individual, and foreign investors are some of the most common ownership types that are discussed in the literature. However, in this research the focus will be on four structures, namely, family ownership, state ownership, institutional ownership, and managerial ownership.

Family Ownership

Most public shareholding firms, around the world, are family owned and controlled (Claesens et al. 2002). In many cases, members of the controlling family hold key managerial positions and roles.

The literature reveals mixed results regarding the effectiveness of family firms. While some researchers established a positive relation between family-controlled firms and firm performance (Anderson and Reeb, 2003; Villalonga and Amit, 2006), other researchers found

an opposite result (Holderness and Sheehan, 1988; Faccio et al. 2001; Miller et al. 2006; and Omran et al. 2008).

State Ownership

One would expect private ownership is more effective than state ownership, but some academics found that state owned firms are as effective as privately owned firms (Martin and Parker, 1995; and Kole and Mulherin, 1997). Moreover, some argued that state ownership means closer management control resulting in improved firm performance (Bo¨s, 1991; Gong, 2000; and Hess et al., 2010). In contrast, some researchers concluded that state ownership negatively related to firm performance (Boardman and Vining's, 1989; Xu and Wang, 1999; Pedersen and Thomsen, 2003; and Bai et al. 2004; and Li et al. 2009). As per Vining and Boardman (1992), Megginson et al. (1994), and Boycko et al. (1996), this harming-effect (coming from state ownership) is attributed to: (1) state is not value maximization oriented, (2) state employs top management not based on their competencies but rather on their political connections, (3) state-owned firms incur higher transaction cost.

Institutional Ownership

Large institutional ownership should provide more effective control on the firm management, leading to lower agency cost and improved firm performance and firm value (Shleifer and Vishny, 1986; Barclay and Holderness, 1990; Wu and Cui, 2002; Tong and Ning, 2004; Ozkan2006, and Aggarwal et al. 2011).

Managerial Ownership[4]

The separation of ownership (shareholders) and control (managers) is the fundamental of the agency theory. Because managers control the firm's assets, they tend to utilize it in a manner that maximizes their interests, but in many cases these interests are not aligned with the owners' interest (Jensen and Meckling, 1976; Fama, 1980; and Fama and Jensen, 1983). Logically, increasing managerial ownerships should align the interests of managers and owners, consequently, reducing agency costs.

Many authors, like Morck, Shleifer, and Vishny (1988), McConnell and Servaes (1990), and Florackis et al. (2009) found empirical evidence that established the positive correlation between managerial ownership and firm value. Kamardin (2014) examined the relation between executive ownership and two firm-level performance measures: return on assets

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[4] Executive or insider ownership

(ROA) and Tobin's Q. using a sample of 112 Malaysian PLCs in year 2006, the results showed a significant positive relation between executive ownership and firms' ROA, however, Tobin's Q showed a U-shape with a turning point at 31.38% for managerial ownership and 28.29% for the managerial-family ownership. Further, other researchers confirmed the non-linear relation, and suggest that the relation between percentage of managerial ownership and firm performance diminishes after a certain level, in what is known as entrenchment hypothesis (Shleifer and Vishny, 1988; Ali and Sanda, 2001; and Chee and MdTaib, 2005, among others). However, Chee and MdTaib (2005) found the positive relation continues even at higher managerial ownership percentages. These results emphasize the need for equity compensation schemes for executive management.

The literature reveals other arguments that may not completely support the abovementioned suggestion. Studies like Agrawal and Knoeber (1996), Han et al. (1999), Firth et al. (2002), and Fernandez and Gomez (2002) report no evidence of any influence of insider ownership on firm performance.

iii.   CEO Duality

The board leadership structure has varied across countries. In the US, 70% to 80% of firms combine the two positions of CEO and chairman, in what is called CEO duality (Rechner and Dalton, 1991; and Rhoades et al. 2001). In the UK, only 10% of PLCs have the same person acting as a CEO and chairman (Coles et al. 2001; Higgs, 2003; and Kang and Zardkoohi, 2005). For the rest of the world, it lies between these two extremes. And in Jordan, the percentage reaches 22% in 2006 (Alwshah, 2009).

In order to mitigate agency risks, by reducing CEO power and improving board control, many academics, regulators, and authorities demand the separation of the two positions (Fama and Jensen, 1983; Cadbury, 1992; and Higgs, 2003; Central Bank of Jordan: Corporate Governance Code for Banks, 2007).

The literature suggests two different views on the relation between CEO duality and firm performance. Agency theorists support a separated board leadership structure. They argue that the board will be dominated by a single person, which will undermine its independence (Fizel and Louie, 1990; Finkelstein and D'Aveni, 1994; and Rhoades et al. 2001), and reducing its monitoring ability (Levy, 1981; Daily and Dalton; 1993; and Jensen, 1993).

On the other side of the argument, stewardship theorists suggest that managers are trustworthy stewards of firm assets (Anderson and Anthony, 1986; Donaldson, 1990; and

Donaldson and Davis, 1991). They believe that work ethic, advancement, and recognition, and establishing good reputation will eliminate any opportunistic behaviour form managers. Further, managers will not act against shareholders' interests in order not to jeopardise their reputation and career. Consequently, stewardship supporters reckon CEO duality could yield a strong unified leadership.

Empirical studies show diversified results regarding the relation between CEO duality and firm performance. Some studies recommend the separation of the two positions as it will positively enhance the firm value or performance (Rechner and Dalton, 1991; Pi and Timme, 1993; Daily and Dalton, 1994; and Chen et al. 2005). In contrast, other studies encourage combining the two positions (Donaldson and Davis, 1991; Brickley et al.1997; Coles et al. 2001; and Lin 2005). Further, few studies did not find any significant correlation between CEO duality and firm performance (Baliga et al.1996; Dalton et al.1998; and Elsayed, 2007).

2.5 Development of Banking Corporate Governance Standards and Principles

The stability of the banking sector is crucial for the stability of global economy. The 2007/2008 financial crisis, which is an example of times of when banking sector lacks stability, led the global economy to its worst recession since the great depression in 1929 (Heather, 2008), resulting in a devastating socially and economically outcomes. In the US, unemployment rate reached 10% in October 2009, and stock market lost nearly $8 trillion during the crisis (Merle, 2018). Given the importance of stability in banking sector, regulators introduced a series of rules and regulations to enhance banks' governance and reduce the risk of another financial crisis in the future. In this section, the importance of banking sector is discussed first, then a summary of role of banks is provided, and finally, the report discusses the development of corporate governance in banks.

2.5.1 Importance and Roles of Banking Sector

Banks play vital role in the financial system. Banks facilitate the borrower-depositors relationship allowing depositors to save their extra cash for a return and providing borrowers with access to funds. Further, banks are integral part in the payment systems. According to the IMF (Gobat, undated), the fundamental function of banks is to collect deposits from individuals with money, aggregate them, and then distribute these funds as loans to those in need. Banks have three main roles: provide loans, facilitate payments, and transmit monetary policy.

Providing loans to individuals, businesses, and governments is one of the banks' key roles in the society. For individuals, these loans will facilitate home ownerships (through mortgages), and pay for important expenditures such as students fees, furniture, holidays, etc. Small businesses do not have access to bond market; therefore, they rely on banks' funding for expansion, asset acquisition, and project finance. Governments issue bonds and treasuries to secure funding for public services. Banks are significant buyer of government bonds.

As per the World Bank, having secure, cost-effective, and easily accessible payment systems and services promotes broader financial inclusion, drives development, and bolsters financial stability (World Bank, 2022). Banks are vital component of payment systems as they act as intermediary between sender and receiver. Banks can leverage their presence (physical and virtual) to support payment systems especially in rural areas.

Monetary policy is key tool for central banks to stimulate the economy. Banks are key players in transmitting monetary policy by influencing money supply. Banks can increase their reserves at central banks, leading to less funds available for lending and this could lead to a "credit crunch" resulting in an economic slowdown. Contradictory, banks can increase money supply (by keeping the reserves level at minimum) leading to more available funds which will result in helping the economy to grow.

In its 1999 "Enhancing Corporate Governance for Banking Organisations" report, Basel Committee for Banking Supervision summarised the role and importance of banks by declaring that Banks are a critical component of any economy. They provide financing for commercial enterprises, basic financial services to a broad segment of the population and access to payments systems. In addition, some banks are expected to make credit and liquidity available in difficult market conditions. The importance of banks to national economies is underscored by the fact that banking is virtually universally a regulated industry and that banks have access to government safety nets. It is of crucial importance therefore that banks have strong corporate governance" (Basle Committee on Banking Supervision, 1999)

2.5.2 Development of Banks Corporate Governance Principles/Guidelines.

The Need for Regulators' Intervention

All companies are subject to a various degree of corporate governance rules and regulations that are enforced by local authorities and governments. This may be impeded in company laws and/or through designated county-level corporate governance codes. Therefore, banks are already subject to these "general" corporate governance codes and mechanisms, so, why

extra codes, roles, and guidelines have been introduced specifically for banks and financial institutions? Many studies examined this question: why regulators' intervention in Banks' corporate governance is necessary? The literature highlights three main reasons as potential answer for the question. First some traditional corporate governance mechanisms, like takeover threats, ownership concentration, and debtholder controls, are not effective for banks (Levine, 2004; Laeven, 2013). Second, banks have opaque operation and complex products which increases information asymmetry resulting in a weakened shareholders' control (Andres and Vallelado, 2008; John, de Masi and Paci, 2016). Third, the importance of banks in financial systems stability and the significant social and economic costs of banks' failure (Alexander, 2006; Franklin and Carletti, 2008). All three reasons will be explored below.

According to Levine (2004) and Laeven (2013), at least three corporate governance mechanisms considered limited in the banking sector: (1) takeover threats; (2) ownership concentration; and (3) debtholder monitoring. Hostile takeovers can discipline managers as they (takeovers) increase the risk of managers being dismissed for weak performance (Hagendorff, Collins and Keasey, 2010). Therefore, the threat of potential hostile takeovers incentivises managers to make decisions that in the shareholders' best interests (Jensen and Warner, 1988; Jensen, 1993). However, in banks and financial institutions, the threat of hostile takeovers is limited due to banks' size (Acharya et al., 2009), the complexity (opaqueness) of banks structures and operation (Hopt, 2015), and the restriction on purchasing banks shares (Levine, 2004). Ownership concentration is a key corporate governance mechanism that reduces agency costs and bridges the gap between managers' interests and shareholders' interests (Shleifer and Vishny, 1997). According to (John, de Masi and Paci, 2016), institutional/Large shareholders have strong motive to monitor managers, and effectively negotiate their contracts and compensations. However, for banks in many countries[5], ownership concentration is restricted to ensure the soundness of lending decisions. This restriction could undermine the large shareholders' monitoring power (Levine, 2004). Debtholders control is another key corporate governance mechanism that does not work as effectively for banks compared with non-financial institutions despite of the fact that banks are highly leveraged firms. Banks heavily rely on deposits of clients as a main source of capital. John, de Masi and Paci, (2016) believe that 90 percent of banks' capital is from debt (customers' deposits). However, in most countries, these deposits are insured (protected) by local authorities and governments. Therefore, banks' bondholders have less incentive to provide effective monitoring on banks because their investments are protected leading to a weakened debtholder control (Demirgüç-Kunt and Huizinga, 2004).

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[5] Barth, Caprio and Levine, (2004) *found that 79 countries out of 107 countries, restrict ownership concentration.*

Banks' operations, products, and balance sheets are more complicated than non-financial firms (Mülbert, 2009; Tao and Hutchinson, 2013). This complexity and opaqueness lead to higher information asymmetry (Andres and Vallelado, 2008) increasing managers' control over company's assets, and allow managers to easily modify investment risks and obtain perquisites easily (Levine, 2004). The opaqueness of banks operations allows bank managers to design compensation packages that overlooks the banks long term interests in favour of managers' short-term interests (Levine, 2004; John, de Masi and Paci, 2016). Therefore, regulators' intervention is required in banking sector to reduce information asymmetry resulting from banks opaqueness which will lead to more effective protection to shareholders' interests.

Stable banking sector is a key requirement for social and economic stability. The 2007/2008 global financial crisis showcased the catastrophic implications of instability in the banking sector. Therefore, bank regulation is needed to: (1) mitigate the social costs that will be created as a result of banks risk taking (Alexander, 2006); (2) protect depositors and reduce systematic risk though ensuring the safety and soundness of the banking sector (John, de Masi and Paci, 2016); and (3) ensure banks operate smoothly and deliver the its' key functions effectively with minimum interruption (Franklin and Carletti, 2008).

The argument that traditional corporate governance mechanisms don't translate well into the banking environment is persuasive. The explanation that hostile takeovers are limited because of bank size, the opaqueness of their operations, and the restrictions on bank share purchases is compelling. However, the contention could have benefited from elaborating more on the specific restrictions imposed on bank share acquisitions and their implications. The mention of ownership concentration and its role in reducing agency costs is a valid point, but its application to banks is well argued. It's clear that certain regulations, meant to maintain the stability of lending decisions, might inadvertently weaken the monitoring power of major shareholders. The role of debtholders as monitors is interesting. The fact that bank capital is majorly from client deposits but is protected by local authorities, thus diminishing the debtholder's motivation to monitor banks, is a nuanced observation. The assertion that the complexity of banking operations and products leads to greater information asymmetry is cogent. When managers have greater control due to such opaqueness, it certainly can lead to short-term decision-making that might not align with the bank's long-term interests. While the assertion makes sense, some practical examples, or specific cases where managers acted against the long-term interests of the bank would have provided greater weight to this claim. The importance of the stability of the banking sector to overall economic and social well-being is undisputed. The global financial crisis of 2007/2008 is a testament to this. The author aptly lists the primary reasons for regulating banks, from mitigating risks to ensuring smooth

operation. The mention of the social costs due to bank risk-taking is especially pertinent given recent historical events.

In summary, regulator's intervention in banks corporate governance is vital to compensate for some of the less-effective corporate governance mechanisms, like takeover threats, ownership concentration, and bondholders' control. Further, banks are characterized by opaque operation and complex products; that impower managers on the expense of shareholders. And the social and economic costs of bank instability is significant, so extra specific regulations are essential to support banking sector stability. I will summarize the main corporate governance interventions, based on issuing body or regulator. The approach will focus on the reports issued by key standards setting bodies at international level, namely Basel Committee on Banking Supervision (BCBS), and Financial Stability Board (FSB).

Basel Committee on Banking Supervision (BCBS)

Following the failure of Bankhaus Herstatt in West Germany, and the instability in international banking and currency markets in 1974, the G10 countries central bank governors established the BCBS. Today, BCBS has 45 members constitute of central banks and bank supervisors of 28 jurisdictions. The committee is the primary global standard setter for the prudential regulation of banks (The Basel Committee - overview, 2022). Based on the information on its website, BCBS aims to boost financial stability by elevating the standard of banking oversight globally. It also provides a platform for consistent collaboration among its member countries regarding banking supervisory issues. BCBS releases Standards, Guidelines, and Practices. Members are anticipated to integrate Standards into their legal structures. Guidelines provide detailed explanations of the Standards, while Practices offer a reference point for members to assess and enhance their existing methods.

In 1992, BCBS issued one of its first reports on banks supervision titled "Minimum Standards for The Supervision of International Banking Groups and Their Cross-Border Establishments". The report aimed at improving information sharing across countries, with no mention of corporate governance issues. 1996, another report titled "The Supervision of Cross-Border Banking" was released; it suggested "proposals for overcoming the obstacles to effective consolidated supervision of the cross-border operations of international banks" (History of the Basel Committee, 2022). There was no reference to corporate governance in this report too. The term Corporate Governance was mentioned for the first time in the 1997 report "Core principles for effective banking supervision". The term was cited 5 times with emphasis on the need to encourage good corporate governance that can be achieved through having an appropriate management structure and proper set of responsibilities for Board and senior management (Basle Committee on Banking Supervision, 1997).

As a response to the 1998 Asian crisis, BCBS issued its first report on corporate governance principles in 1999 under the title: "Enhancing Corporate Governance for Banking Organisations". The report built on the 1999 OECD Corporate Governance Codes importance, emphasised on the importance of good corporate governance. It recommended some key "practices" to assist banks in improving its corporate governance. The report focused on corporate structure (relationship between Board and senior management), and Board responsibilities and roles. In 2006 and following up on the 2004 OECD's report on Corporate Governance Principles, BCBS published its second report with a title: "Enhancing Corporate Governance for Banking Organizations". The report included 8 principles to promote sound corporate governance in banks. The report re-emphasised the roles and responsibilities of the Board, managing conflict of interest, and the role of supervisors or regulators. Both 1999 and 2006 reports have little information about the importance and role of standalone board level risk committee. In 2010, and following the 2007/2008 global financial crisis, BCBS issued a third report titled: "Principles for Enhancing Corporate Governance". The more detailed report (42 pages compared to 14, and 30 pages of the 1999 and 2006 reports respectively) shifted the attention and awareness to "risk governance", especially the role Chief Risk Officer (CRO) and Risk Management Committee. This attention is evident by the number of citations or reference to the two terms in the 2010 report (30 times) compared to 3 times in the two previous reports combined. The report presented 13 principles that elaborated on areas like, risk management function, risk identification, monitoring, and controlling, risk communication, and compliance. In 2015, BCBS published an updated report on banks corporate governance with the title: "Corporate Governance Principles for Banks". The "Guidelines" build on the 2013 FSB report: "Thematic review on risk governance". The focus on risk governance issues has strengthened in this report with more details about the characteristics of the risk committee: (1) it should be chaired by an independent director; (2) majority of its members should be independent; and (3) members should have experience in risk management issues and practices. Further the report elaborated on the role and characteristics of the Chief Risk Officer (CRO). The CRO oversees developing the risk management function and supervising it. They ensure that the bank's risk management processes are strong and efficient enough to support its strategic goals and all associated risk-related activities. (Basel Committee on Banking Supervision and Supervision, 2015). Further, The CRO's responsibilities include the ongoing monitoring of risk limits adherence and risk-taking activities performance. CRO attributes were also detailed in the 2015 report. CRO should be independent; have the necessary skills to perform his/her duties; have enough authority and access to information; have direct access to and meet regularly with the risk committee.

Table 1: Summary of Basel Committee Reports

Description	Basel Committee Reports on Banks Corporate Governance			
	1999	2006	2010	2015
Length (number of pages)[6]	14	30	42	43
Nature of Report	Practices	Principles	Principles	Guidelines
Triggered By	Asian Crisis	High profile break downs in corporate governance / Follow up on OECD principles	2007/2008 Financial Crisis	2013 FSB peer review recommendations
Theme/Emphasis	Bank structure; Board responsibilities; and compensations	Board roles and responsibilities; conflict of interest	Risk Management; internal control; and Board practices	Risk Governance (risk culture and risk appetite), and Board, Risk Committees, and CRO roles.
Number of times Risk Committee is cited[7]	1	2	8	17
Number of times Chief Risk Officer is cited[8]	0	0	22	30
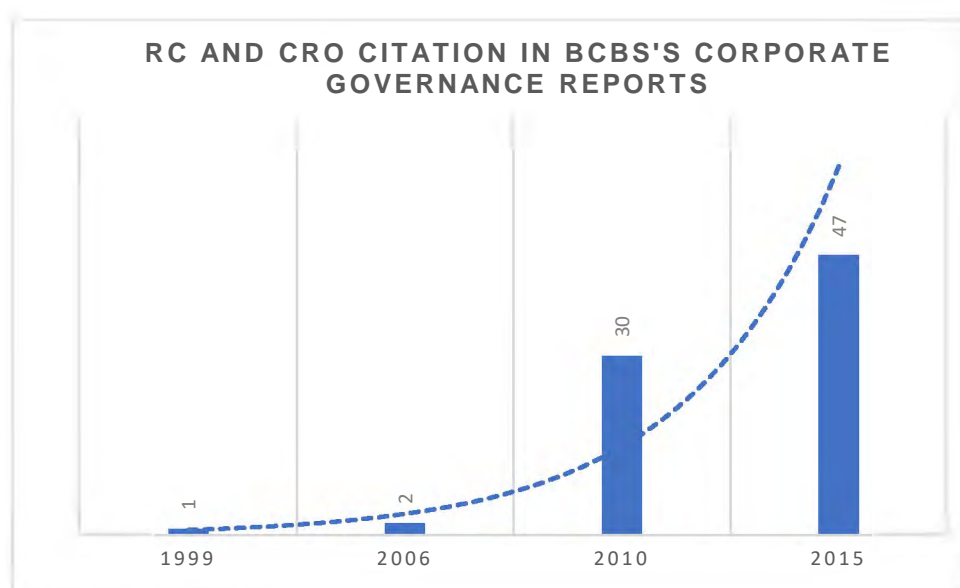
Figure 1: RC and CRO citation in BCBS's corporate governance reports

In addition to the abovementioned corporate governance reports, BCBS influenced the banks' risk-taking level by introducing the Basel Capital Accord in 1988 for what is known to be: Basel I. Under the accord, banks to meet a minimum capital to weighted risk assets ratio of 8% with at least 4% of the capital is core capital (equity). In 2004, BCBS published Basel II, a new capital framework, to replace Basel I. The new framework maintained the 8% capital ratio

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[6] Based on identifying number of pages for each report given all reports were accessible from the same device.

[7] I searched each report for "Risk Committee" or "Risk Management Committee".

[8] I searched each report for "Chief Risk Officer" or "CRO".

requirement but provided more details about capital classification into Tier-1, Tier-2, and Tier-3 capital, based on the risk level inherited in each capital. Tier-1 represents basic equity, Tier-2 includes Supplementary capital (Undisclosed reserves, Revaluation reserves, General provisions/general loan-loss reserves, Hybrid debt capital instruments, and Subordinated term debt), and Tier-3 equal the Short-term subordinated debt. Responding to the 2007/2008 global financial crisis, BCBS issued new reforms under the Basel III. The objective of these reforms is to strengthen the resilience of banks in the awake of the financial crisis. The reforms included: (1) Banks to incur capital charges through credit valuation adjustment (CVA) linked to the deterioration in the credit worthiness of a counterparty; (2) Re-defining capital into two tiers only: Tier-1 Capital (includes Common Equity Tier-1, and Additional Tier-1), and Tier 2 Capital (includes Share premium, some provisions); (3) Common Equity Tier-1 Capital ratio of 4.5%; Tier-1 Capital ratio of 6%; and Total Capital ratio is 8% (Basel Committee on Banking Supervision, 2010).

Financial Stability Board (FSB)

In its response to the 2007/2008 global financial crisis, the governments of the G20 approved the creation of FSB as a successor of the 1999 Financial Stability Forum (FSF). FSB's objectives include (1) promoting the reform of international financial regulation and supervision; and (2) standard-setting and in promoting members' implementation of international standards (History of the FSB, 2022). In this study and given the wide range of areas covered by the work of FSB, I will focus on the FSB's work related to risk governance and more specifically related to the roles and attributes of both risk committee and chief risk officer.

In 2008, FSB released one of its first reports titled: "Risk Management Lessons from the Global Banking Crisis Of 2008". This report concludes that one of the key lessons learned from the banking crisis of 2008 is that some banks over-relied on and permitted excessive leverage which increased solvency risk. Among other factors, the report cites risk governance weaknesses as a key reason for the excessive leverage (Senior Supervisors Group, 2009a).

In 2013, FSB published its "Thematic Review on Risk Governance". The report aimed to: (1) promote cross-country and cross-sector standards implementation; (2) evaluate standards and policies results; and (3) make recommendations based on the identified weaknesses and gabs. In reference to risk committee and chief risk officer, the report concluded: (1) Banks have made progress in establishing a stand-alone board level risk committee that is constituted only with independent members and instituting a chief risk officer (CRO); however, (2) 50% of the surveyed banks did not meet the evaluation criteria for defining the responsibilities of risk committees. The report highlighted some sound risk governance practice that include: (1) the

board should conduct (minimum annually) a review of directors' qualifications, skills, time commitment, and training needs; (2) The risk committee is required to be a stand-alone committee (distinct from the audit committee); chaired by an independent director; composed of independent members who have experience in risk management issues and practices. Regarding the risk committee roles, it should: discuss all risk strategies; review and approve the bank's risk policies (at least annually); and ensure the bank's adherence to the approved risk policies by overseeing that management has established appropriate processes to achieve that; and (3) The CRO: a) has the organisational stature, seniority, skillset, authority, and character required to oversee and monitor the bank's risk management; b) reports directly to the CEO and the risk committee; c) meets periodically with the board and risk committee in the absence of executive directors or management; d) is appointed (and dismissed) with the approval of the risk committee or the board, and appointments (and dismissals) are disclosed publicly; e) should ensure that adequate resources are available for the risk management function; f) is "actively" involved in key decision-making processes (from risk perspective); and setting of risk-related performance indicators; h) meets (quarterly at minimum), with the bank's supervisor. The report, and in relation to risk committee and CRO, recommended: (1) national authorities should set requirements to establish communication procedures between risk committee and other board's committees, like finance and audit committees; and to set requirements to elevate the authority, stature, and independence of CRO; and (2) standard-settings bodies (like BCBS) should review their corporate governance principles to incorporate FSB's proposed sound risk governance practices (FSB, 2013).

In 2017, FSB issued a more comprehensive corporate governance thematic review. The report surveyed 23[9] countries and jurisdictions on various corporate governance issues. It found that risk committee is required by law in 16 countries and jurisdictions (Australia, Brazil, China, EU, Germany, Italy, Spain, UK, India, Indonesia, Korea, Mexico, Saudi Arabia, Singapore, South Africa, and Switzerland). In US and Turkey, there was no legal requirement to establish a standalone risk committee, while in Argentina, Canada, and Russia it was required in the Corporate Governance Code. France required the establishment of separate risk committee as a listing rule (Financial Stability Board, 2017).

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[9] Netherlands was surveyed but no response was provided.

Figure 2: RC-establishment requirement in 23 countries surveyed by FSB.

2.5.3 Risk Committee Characteristics, Roles, and Responsibilities

In its report Corporate Governance for Banks (Basel Committe on Banking Supervision, 2015), Basel Committee on Banking Supervision highlighted the characteristics, roles and responsibilities of risk committee (RC) as follows:

- RC is required for systemically important banks[10] and is strongly recommended for other banks based on a bank's size, risk profile or complexity.
- RC should be separate from the audit committee, but it may have other relevant tasks.
- RC should be chaired by an independent director (not the chair of the board or of any other committee).
- RC should, by majority, constitute of independent directors who have experience in risk management practices and issues.
- RC should discuss risk strategies at both aggregate basis and sole basis, i.e discuss each risk type separately in addition to discussing aggregate risk level. Based on these discussions, RC should make recommendations to the board on the bank's overall risk appetite.
- RC is required to review the bank's risk policies at least once annually. Also, RC should ensure that management has in place the necessary processes to support the bank's overall adherence to the bank's approved risk policies.
- RC is responsible to advise the bank's board on the bank's overall both current and future risk appetite, supervise senior management's implementation of the risk appetite statement, report on the position of risk culture in the bank, and interact with and oversee the Chief Risk Officer.
- RC should oversee the strategies for the management of capital and liquidity as well as for all relevant risks of the bank. This includes market risk, credit risk, reputation,

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[10] As per BCBS assessment.

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and operational risk and reputational risks, to ensure they are consistent with the risk appetite statement.

- RC should receive frequent reporting and communication from the Chief Risk Officer and other relevant officers/functions regarding the bank's current risk profile and risk culture, utilisation against the stated risk appetite, limits and limit breaches, and risk mitigation efforts/plans.

- RC should establish effective communication and coordination with the audit committee to enable the exchange of information and effective handling of all risks, including evolving risks, and any required adjustments/amendments to the bank's risk governance framework.

In the UK, the Financial Conduct Authority (FCA) provided more details regarding the responsibilities of the Risk Committee. In its 2016 report titled "Senior Management Arrangements, Systems and Control", FCA highlighted the following tasks/functions to fall within the responsibilities of the Risk Committee (Financial Conduct Authority, 2016):

- RC should advice the firm's governing body or board of director or on risk strategy. This includes the oversight of firm's existing risk exposures.

- RC should develop proposals highlighting the firm's overall risk appetite and risk tolerance. Also, RC should develop metrics to monitor and measure the firm's risk management performance.

- RC should challenge and oversee the design and implementation of stress testing.

- RC should challenge and oversee the day-to-day risk management activities.

- RC should oversee and challenge the due diligence on: (1) risk matters related to material or significant transactions; and (2) strategic proposals that are require governing body or Board approval.

- RC should advice the bank's remuneration committee on risk weightings that need to be applied to performance objectives that influence the incentives of the executives.

- RC should advice, challenge and oversee development of sound risk culture at entire bank level.

Financial Stability Board (FSB) issued a peer review report titled "Thematic Review of Risk Governance" in which it recommended some characteristics and responsibilities of the bank's Risk Committee (FSB, 2013):

- RC is required to be a stand-alone committee, separate from the audit committee.

- RC should be chaired by an independent director and avoids "dual hatting" with the chair of the board, or any other committee.

- RC should include independent members who have experience in risk management.

- RC should discuss bank's risk strategies on both an aggregated basis and by type of risk.

- RC should review and approve the bank's risk policies at least annually.
- RC should ensure the bank's adherence to the approved risk policies and that management implies effective risk processes.

2.5.4 Chief Risk Officer Characteristics, Roles, and Responsibilities

"Banks should have an effective independent risk management function, under the direction of a chief risk officer (CRO), with sufficient stature, independence, resources and access to the board" (Basel Committe on Banking Supervision, 2015, p. 25). Clearly, BCBS identifies the CRO as the officer responsible for the bank's overall risk management function. BCBS provides more details regarding the CRO role and characteristics as following:
- The CRO is responsible to oversee the development and implementation of the risk management function of the bank. Under this general directions, the BCBS explains what is included under this primary responsibility: (1) ensure that the bank's risk management capabilities are effective and sufficient to support bank's risk taking activities and strategic risk objectives through strengthening staff skills and enhancing banks' risk management policies, systems, processes, quantitative models and reports; (2) support the board in overseeing and engaging in the development of bank's risk appetite statement and for converting the risk appetite into risk limits structure; (3) engage, actively, in monitoring adherence to risk levels and risk taking activities; and (4) manage and participate in key decision-making processes (like, strategic planning, development of new products and service, capital and liquidity planning, and compensation design and operation).
- The CRO should have the organisational stature, seniority/authority, and the necessary skills to supervise the bank's risk management function. Accordingly, the CRO should be independent with duties separate from other executive functions, that requires the CRO to have immediate access to any information necessary to accomplish his or her duties. However, and to ensure sufficient time is devoted to risk management function, and independence, the CRO should not have financial and/or management responsibility. Further, the CRO should not exercise "dual hatting" (i.e., act as a chief financial officer, chief operating officer, chief auditor, or other senior manager role). In terms of reporting, the CRO should report to the bank's board or its risk committee, also, he or she should have direct access to the bank's board or its risk committee without any impediment. The CRO should be able to interpret and communicate risk activities and strategies and effectively engage the board or its risk committee and management in productive dialogue on key risk activities and issues. This dialogue or interaction (between the CRO and the board and/or risk committee) should take place

frequently. Meetings between he CRO and the bank's board and/or its risk committee without the presence of executive directors should be allowed and facilitated.

- The board or its risk committee should be responsible for the appointment and dismissal of the CRO. Also, they should approve any changes to the CRO position. The bank's board or its committee should review the CRO's performance, and budget and compensation. In an event of CRO removal, the bank should discuss with its supervisor/regulator the removal reasons. Further, A public disclosure should be provided if the CRO is removed from his or her position.

Financial Stability Board (FSB) issued a peer review report titled "Thematic Review of Risk Governance" in which it recommended some characteristics and responsibilities of the bank's Chief Risk Officer (CRO) (FSB, 2013):

- Banks need to ensure that the CRO has the organisational stature, skill set, authority, and character needed to oversee and monitor the bank's risk management processes.
- CRO should apprise key management and board members of the bank's risk profile and relevant risk issues on a timely and regular basis.
- CRO should have a direct reporting line to the board and/or risk committee, and a direct reporting line to the CEO with a distinct role from other business line responsibilities or executive functions.
- CRO should meet meets periodically with the board and risk committee without the presence of executive directors or management.
- CRO is appointed (and dismissed) with input or approval from the board or risk committee. These appointments and dismissals should be disclosed publicly.
- CRO should be independent of business lines and has the appropriate stature in the bank. CRO performance, compensation and budget should be reviewed and approved by the board or the risk committee.
- CRO should ensure that adequate resources are available to the risk management function in accordance with the bank's complexity, Risk Appetite Framework, and strategic plans.
- CRO should be actively involved in all risk related decision-making processes. This includes decisions related to reviewing the business strategy, new product approvals, strategic planning, stress testing, mergers and acquisitions, recovery and resolution planning, and funding and liquidity management planning). CRO should challenge management's decisions and recommendations on those matters.
- CRO should be actively involved in establishing performance indicators to adequately measure and monitor risk management performance.
- CRO should meet regularly (quarterly at minimum) with the bank's supervisor to discuss the scope and coverage of the risk management function.

Chapter Three: Risk Committee: Impact on Bank Risk and Performance

The Risk Committee plays an indispensable role in shaping a bank's risk management practices and overall performance. In this chapter, I delve into the various aspects of the Risk Committee, its impact on risk management, and the subsequent effects on a bank's risk management practices and financial performance.

Composition and Structure of the Risk Committee

The Risk Committee comprises members from the bank's board of directors, with most of them being independent and non-executive directors. The composition aims to ensure the committee's objectivity and independence in overseeing the bank's risk management framework. Typically, the Risk Committee includes members with diverse backgrounds and expertise, such as finance, risk management, regulation, and banking operations. The Risk Committee is often structured with a chairperson, who is responsible for setting the agenda and leading discussions. The committee may also include subcommittees, focusing on specific risk areas like credit risk, market risk, or operational risk. The structure enables the Risk Committee to address complex risk issues with specialized attention.

Roles and Responsibilities of the Risk Committee

According to BCBS and FSB, the primary roles and responsibilities of the Risk Committee include:

1. Defining Risk Appetite

The Risk Committee is responsible for establishing and regularly reviewing the bank's risk appetite, which defines the level and types of risk that the institution is willing to accept in pursuit of its strategic objectives. The risk appetite is typically expressed through quantitative and qualitative measures.

2. Overseeing Risk Management Framework

The Risk Committee oversees the implementation of the bank's risk management framework, ensuring that it aligns with the institution's risk appetite and regulatory requirements. This includes reviewing and approving risk management policies, procedures, and controls.

3. Monitoring Risk Exposure

The Risk Committee monitors the bank's risk exposure to ensure that it remains within the defined risk appetite. The committee evaluates risk reports, analyses risk trends, and identifies emerging risks that may affect the bank's financial stability and performance.

4. Reporting to the Board

The Risk Committee is accountable to the board of directors for its activities and decisions. The committee provides regular updates to the board on the bank's risk profile, risk management performance, and emerging risks.

In this thought-provoking chapter, I delve deep into the realm of Risk Committees and their influence on a bank's risk management and overall performance. As financial institutions face an increasingly challenging and dynamic global economy, understanding the impact of Risk Committees on various aspects of bank risk and performance is crucial. This chapter is divided into four main sections, each designed to provide a comprehensive understanding of the topic at hand. Section 1, Literature Review and Research Hypothesis Development: I begin with a thorough review of existing literature on the subject, focusing on the attributes of Risk Committees and their impact on bank risk and performance. This section explores various factors such as the existence, size, qualifications, and meetings frequency of the Risk Committee, and how each factor potentially affects the bank's risk and performance. Section 2, Design and Methodology: In this section, I outline the research design and methodology used to examine the relationship between Risk Committees and bank risk and performance. I discuss the sample selection, data sources, estimation model, and provide detailed definitions and descriptions of the variables considered in the study. Section 3, Data Analysis:

following the methodology, I move on to data analysis, which is divided into two parts: univariate and multivariate analysis. The univariate analysis provides an initial examination of the data, while the multivariate analysis delves into a more in-depth exploration of the relationships between the various factors and bank risk and performance. Section 4, Findings and Results: finally, I present the findings and results, synthesizing the data analysis to draw meaningful conclusions about the role of Risk Committees in shaping a bank's risk landscape and overall performance. I discuss the significance of the findings, their implications for both practitioners and policymakers, and offer suggestions for future research directions in this vital area of financial governance.

3.1 Literature Review and Research Hypothesis Development

I searched the Brunel Library online site, which includes most of the largest databases[11], in multiple fields including business, economics, and finance. I used the following selection criteria: (1) all fields: "risk committee" or "risk management committee" or "risk management unit"; (2) And: All fields: "Bank" or "Banking"; (3) Content type: Peer reviewed Journal articles and scholarly material; (4) Language: English; (5) Disciplines: All. The initial search yielded 73 articles. After carefully reading the abstract of these articles, I identified 29 articles where the

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[11] Some of the databases included are Scopus, Web of Science, Social Sciences Citation Index, Ingenta Connect, Elsevier, Emerald Journals, ScienceDirect Journals, and Business Source Premier.

risk committee and/or at least one of its attributes was examined. Then, and to improve the reliability and quality of outcomes, articles from journals rated 1 or above in the "Academic Journal Guide (2018) by Chartered ABS" were selected, and that resulted in 22 qualified articles.

3.1.1 Risk Committee attributes and Bank Risk and Performance

The emphasis, by regulators, on establishing a standalone Risk Committee grew significantly following the 2007-2008 financial crisis. As they argue that poor risk management and oversight contributed to the 2007-2008 financial crisis (Kashyap, Rajan and Stein, 2008; Erkens, Hung and Matos, 2012). And boards failed (during the crisis) to determine the true risk exposure of major banks and disclose risk oversight deficiencies (Senior Supervisors Group, 2009b). US Financial Crisis Inquiry Commission (FCIC) reported that the main reason for the 2007-2008 financial crisis was that several financial institutions engaged in many excessive risk-taking strategies. Further, Financial Stability Board (FSB) stated that one of the primary reasons of excessive risk taking before the 2007-2008 financial crisis was that insufficient time was dedicated to risk management by board directors (Senior Supervisors Group, 2009b). Further, BCBS in its 2010 report, titled "Principles for Enhancing Corporate Governance", identified both inadequate risk management and insufficient board oversight as key reasons for the 2007/2008 global financial crisis.

To address the above shortcomings, standards-setters, like BCBS and FSB, recommended the establishment of board level risk committee that is separate from the Audit committee (Bank for International Settlements, 2010; FSB, 2013). As a result of these recommendations, country-level regulators started to emphasise on the need to establish a board level standalone risk committee. In the US, in 2014, the Federal Reserve Board of Governors (FED) finalized a rule under the Dodd-Frank Act that requires publicly traded bank holding companies (BHC) with total assets greater than $10b to establish a board level separate risk committee. In the UK, the Financial Conduct Authority (FCA) in 2014, and following Walker's (2009) recommendations, made it mandatory for UK banks to form a standalone risk committee. Similar theme applied in EU, as the European Banking Authority (EBA) in 2014 demanded that significant institutions (this applies to listed banks) shall establish a standalone risk committee.

A robust risk management function is essential in risk identification and excessive risk-taking prevention (Kashyap, Rajan and Stein, 2008; Stulz, 2008). The formation of a separate risk committee should improve the risk management function through (1) ensuring that risk management practices are adhered to (Hopt, 2013); (2) signalling the board's commitment to sound control systems (Cummins et al., 2009); (3) enhancing risk-monitoring ability of directors

over managers (Jensen and Meckling, 1976; Aebi, Sabato and Schmid, 2012; Minton, Taillard and Williamson, 2014); and (4) making the firm's risk profile clearer to the board (Yale, Grove and Clouse, 2013).

Until 2015, regulators and standards sitters provided little description about RC characteristics and the emphasis was mainly on RC existence. In 2015, BCBS provided more details regarding risk committee qualification and experience, and independence (FCA, EBA, (Basel Committee on Banking Supervision and Supervision, 2015). However, little information is provided regarding some other key characteristics, like RC size, and RC number of meetings.

The literature on RC attributes and bank risk and performance is limited. Few empirical studies examined the relationship between some RC attributes and bank (or financial institutions) risk and/or performance. To the best knowledge of the author, this research will be the first to examine the five key RC attributes (existence, size, qualification, independence, and meetings) in one paper. Further, this is the first paper to sample commercial banks only eliminating the need to control for bank's diversification activities. And the sample is drawn from United States (US) banks only to ensure impact of differences and variations in local regulation, laws, and ecosystems is eliminated. Also, the research will cover the period post regulation advancement, since many papers, in this area, focused on the RC attributes and bank risk and/or performance pre and/or during the 2007-2008 financial crisis (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Battaglia and Gallo, 2015; Aljughaiman and Salama, 2019; Iselin, 2020).

3.1.1.a Risk Committee Existence and Bank Risk and Performance

Following the regulators and standards-sitters push for the need to establish a standalone Risk Committee in banks, research in risk governance domain started by investigating the impact of establishing a stand-alone risk committee on banks' risk taking and performance. Studies sought to reveal the effect of risk committee presence on banks' outcomes, like performance, risk, risk taking, risk disclosure, etc. The literature shows mixed patterns/results. Some researchers concluded that the risk committee presence has no impact on banks' outcomes (Aebi, Sabato and Schmid, 2012; Minton, Taillard and Williamson, 2014; Hines and Peters, 2015; Abid *et al.*, 2021). Other researchers found some undesirable outcomes associated with RC existence (Zemzem and Kacem, 2014; Hines *et al.*, 2015; Akbar *et al.*, 2017; Elamer and Benyazid, 2018; Aslam and Haron, 2020). However, some authors found positive outcomes for establishing a stand-alone risk committee (Yeh, 2017; Aljughaiman and Salama, 2019; Iselin, 2020; Abid *et al.*, 2021; Azim and Nahar, 2021; Nahar and Jahan, 2021; Nguyen, 2022)

Aebi, Sabato and Schmid, (2012) examined the relationship between RC existence and bank performance for 85 US banks during the 2007-2008 financial crisis period. Using three performance measures (Buy-and-Hold Return; ROE, and ROA), they concluded that RC presence is not beneficial for the banks' crisis performance unless the RC is dedicated and meets more frequently. The results are consistent with (Hines and Peters, 2015) who investigated US financial institutions (FIs) which voluntary formed RC. They collected data for the period 1994 to 2008. The researchers found no association between RC existence and FIs operational and performance improvements. Further, and when using the existence of RC as a control variable, Minton, Taillard and Williamson, (2014) find that the presence of RC does not impact stock performance or capital ratios during the 2007-2008 financial crisis for financial institutions with more than $1billion in assets from multiple countries. Still, the research design does not emphasis on identifying the impact of RC existence since it is used as a control variable. Surprisingly, all the abovementioned articles focused on the impact of RC existence on banks' performance rather than risk taking or risk management. Abid *et al.*, (2021) found no association between RC existence and bank's performance for a sample of 1,480 observations for Asian banks from 2010 to 2017. The authors also reported a weak significant association between RC existence and operation risk. Qureshi and Lamarque, (2022) examined the impact of RC activity (measured by RC existence, independence, and financial experience) and on the credit risk of Significantly Supervised European Banks (SSEB). The authors investigated the period 2013 to 2017. The study measured credit risk using a proxy of impaired loans ratio of total loans. The authors found that RC activity was insignificant in reducing SSEB's credit risk. However, the impact of RC existence on credit risk was not identified due to the research design and methodology, as RC existence was one element of a risk management index.

Zemzem and Kacem, (2014) found a negative relationship between RC existence and firm performance using a sample of 17 Tunisian lending institutions during the period of 2002 and 2011. Relatedly, Elamer and Benyazid, (2018) examined the relationship between RC existence and UK Financial Institutions' (FIs) performance, measured by Return on Equity (ROE) and Return on Assets (ROA). Using a sample of all FIs listed in the FTSE-100 for the period 2010 to 2014, the authors found a negative and significant association between RC presence and FIs' ROE, concluding that FIs with no RC performed better than those with RC. The negative association also reported between RC size, RC independence, and RC meeting frequency from one side and FIs' performance from the other side. Hines *et al.*, (2015) examined the relationship between RC existence and audit fees using a sample of 3,980 observations from US listed banks for the period 2003-2011. They found that the RC existence is associated with higher audit fees. Also, and using a sample of financial firms of FTSE all-share index for the period 2003 to 2012 (Akbar et al., 2017), finds a positive association between RC presence and Z-risk or idiosyncratic risk. However, the study deploys rarely used,

in the literature, two dependent variables (Z-risk and idiosyncratic risk). Also, and using a sample of 129 Islamic Banks from 29 countries for the period 2008-2017, Aslam and Haron, (2020) found a negative and significant effect on bank's performance, measured by ROE and ROA. The authors argue that the existence of RC limits the managers ability to take excessive risks which has a negative impact on bank's performance. Further, Mashamba and Gani, (2022) examined risk governance and risk taking in African banks. The study used a sample of 41 listed banks in 12 African countries for the period 2011 to 2020. The study found that RC presence has a positive association with bank's risk taking, measured by the ratio of risk-weighted assets to total assets.

However, some studies found favourable outcomes when examining the impact of RC existence on banks' risk and performance. Amoozegar, Pukthuanthong and Walker, (2017) constructed a Risk Management Index (RMI), that includes RC variables (RC presence, risk-related experience, and number of meetings), to investigate the impact of RM on banks litigation risk (measured by the number of times a bank was subject to a class action lawsuit). The study used a sample of 432 observations for sued financial institutions for the period 1996 to 2011, and it found that banks with higher RMI are less likely to be sued. However, and due to the research design and methodology, the impact of RC presence alone is not identified. Yeh, (2017), using a sample of 78 publicly listed regional Japanese banks for the period 2007-2008 (financial crisis period), found RC presence reduced the banks' default risk during the financial crisis through effective monitoring and controlling of risks. Aljughaiman and Salama, (2019) investigated risk governance mechanisms in the Middle East and North Africa (MENA) region across both Conventional Banks (CBs) and Islamic Banks (IBs). They found that RC existence is significantly and negatively associated with risk-takings, measured by an index representing banks' credit, market, liquidity, insolvency, and operational risks, in both CBs and IBs. But they reported that RC existence only improve risk management effectiveness in CBs and not within IBs. The authors used a sample of 65 listed banks for the period from 2005 till 2015 to cover pre and post crisis period. Iselin, (2020) examined the relationship between RC existence and Tier-1 capital ratio for US banking holding companies with assets greater than $10 billion during the period 2004-2010. The study focuses on two economic periods/status: stable (pre-crisis) and crisis. It finds that RC existence is associated with lower (higher) Tier-1 capital ratios in the stable (crisis) period. Nahar and Jahan, (2021) used a sample of 160 banks from different 45 countries for a period from 2006 to 2016, generating a sample of 1,760 observations. The authors found a positive and significant association between RC presence and bank's performance, measured by Return on Assets (ROA) and Tobin's Q. Azim and Nahar, (2021) examined the impact of RC on risk disclosure in public banks in Bangladesh. The authors found that the presence of RC is a critical contributing factors for risk disclosure. Abid *et al.*, (2021) found a significant negative association between RC existence and credit

and liquidity risks for a sample of 1,480 observations for Asian banks from 2010 to 2017. The authors also reported a weak significant association between RC existence and operation risk. Galletta, Mazzù and Scannella, (2021) examined the relationship between RC existence and liquidity risk in European banks from 2011 to 2017. The authors found a significantly negative association between liquidity risk, measured by loans-to-deposits ratio, and RC existence. Further, Nguyen, (2022) examined the relationship between risk governance structure, which includes the existence of RC, and a bank's operation scope and monitoring benefit. Using a sample of 104 commercial banks in 10 ASEAN countries for the period 2002-2019. The author found that risk committee existence has: (1) a positive (albeit not significant) relationship with bank's scope of operation; (2) a negative association with monitoring cost; and (3) a negative (significantly negative) association with negotiation power of CEOs.

As discussed, existing literature shows mixed patterns/results when considering the impact of RC existence on bank's outcome. Some researchers found that the risk committee presence has no impact on banks' outcomes (Aebi, Sabato and Schmid, 2012; Minton, Taillard, and Williamson, 2014; Hines and Peters, 2015; Abid *et al.*, 2021). Other researchers found some undesirable outcomes associated with RC existence (Zemzem and Kacem, 2014; Hines *et al.*, 2015; Akbar *et al.*, 2017; Elamer and Benyazid, 2018; Aslam and Haron, 2020). However, some authors found positive outcomes for establishing a stand-alone risk committee (Yeh, 2017; Aljughaiman and Salama, 2019a; Iselin, 2020; Abid *et al.*, 2021; Azim and Nahar, 2021; Nahar and Jahan, 2021; Nguyen, 2022).

3.1.1.b Risk Committee Size and Bank Risk and Performance

According to the resource dependency theory, larger committees offer greater resources for handling challenges and tasks/problems. Therefore, RC size should have a positive (negative) association with bank performance (risk). However, the scarce empirical research on RC size found mixed results about the relationship between RC size and bank's performance and/or risk.

Battaglia and Gallo, (2015) found a positive relationship between RC size and financial performance, measured by Return on Assets (ROA) and Return on Equity (ROE), in 36 Indian and Chinese banks during the period 2007-2011. However, RC size was negatively associated with market valuation, measured by Tobin's Q, and expected market growth, measured by Price to Earnings ratio (P/E). Similarly, and focusing on the post financial crisis period 2008 to 2012, Kweh et al., (2018) finds that larger RCs in the Malaysian banks lead to improved performance, measured by an efficiency score that captures overall efficiency, managerial efficiency, or profitability efficiency. Further, Aljughaiman and Salama, (2019), includes RC

size as a one of five variables (in addition to Independency, number of meetings, financial qualification, and multi-membership) to capture banks' RC effectiveness. They create a Risk Governance Index (RGI) that includes RC and CRO characteristics. The results show that banks with higher RGI have lower overall risks. However, the RC size is not directly investigated due to the research design. Moreover, Lee et al., (2020) found that larger RCs are better in controlling risk-taking in 29 Malaysian banks during the period 2007 to 2016. The study used four risk-taking measures: credit, insolvency (invert of z-score), portfolio risk, and assets risk. Further, Galletta, Mazzù and Scannella, (2021) examined the relationship between RC size and liquidity risk in European banks from 2011 to 2017. The authors found a significantly negative association between liquidity risk, measured by loans-to-deposits ratio, and RC size. Specifically, the authors concluded that increasing RC size by one member should decrease liquidity risk by 0.02%. Abid *et al.*, (2021) found a significant negative association between RC size and credit and liquidity risks for a sample of 1,480 observations for Asian banks from 2010 to 2017. The authors also reported a weak significant association between RC size and operation risk.

Gontarek and Belghitar, (2018), examined the risk governance in 140 large US BHCs for the period 2012 and 2015. They found no association between RC size and BHCs performance outcomes (ROA, ROE, Operating Income, and Holding Period Returns) or risk outcomes (Loan Loss Provision, the z-score and tail risk). The researcher concluded that rather than observable features of the risk committee (its size or expertise levels, for example), it is the activities performed within these board forums (such as the articulation of risk appetite) that may better explain improvements to selected BHC outcome measures. However, Hines *et al.*, (2015) examined the relationship between RC size and audit fees using a sample of 3,980 observations from US listed banks for the period 2003-2011. They found that the RC size is associated with higher audit fees. Also, Elamer and Benyazid, (2018) found a negative association between RC size and both ROE and ROA for a sample of UK FTSE 100 listed Financial Institutions from 2010 to 2014. Nahar and Jahan, (2021) used a sample of 160 banks from different 45 countries for a period from 2006 to 2016, generating a sample of 1,760 observations. The authors found that RC size is not "directional" for bank's performance, measured by Return on Assets (ROA) and Tobin's Q. Qureshi and Lamarque, (2022) examined the impact of RC size on the credit risk of Significantly Supervised European Banks (SSEB). The authors investigated the period 2013 to 2017. The study measured credit risk using a proxy of impaired loans ratio of total loans. The authors found that RC size was insignificant in reducing SSEB's credit risk.

3.1.1.c Risk Committee Independence and Bank Risk and Performance

Independent directors can make more efficient decisions because they have no fear of jeopardizing their careers (Dionne and Triki, 2005). Also, larger number of independent directors on the board ensures more objective decisions (Wu, Lin and Lin, 2009) and better decisions (Dionne and Triki, 2005). However, the empirical literature does not conclusively support these arguments and findings.

Yeh, Chung and Liu, (2011) investigated the largest 20 financial institutions (FIs) in the G8 countries during the period 2007 to 2008. They concluded that RC independency, measured by % of independent directors in the RC, positively influenced the FIs performance during the 2007-2008 financial crisis. The researchers used market-based performance measure: stock return; and accounting-based measures: ROA and ROE.

Tao and Hutchinson (2013) researched Australian financial companies from 2006 to 2008. Their findings suggest the significance of having remuneration and risk committees composed of members who operate independently from management, possess industry and board experience, hold professional qualifications, and convene regularly. The study used Risk Committee Monitoring (RCM) as an explanatory variable that includes committee size, independence, experience, and activity (number of meetings), and reported a positive association between firm performance and RCM. However, the research design does not allow for a direct examination of the relationship between RC independence and firms performance.

Aljughaiman and Salama, (2019), includes RC Independency as a one of five variables (in addition to size, number of meetings, financial qualification, and multi-membership) to capture banks' RC effectiveness. They create a Risk Governance Index (RGI) that includes RC and CRO characteristics. The results show that banks with higher RGI have lower overall risks. However, the RC Independency is not directly investigated due to the research design. Dupire and Slagmulder, (2019) studied a sample of 33 insurance companies and 54 banks from Europe for two years of observations 2007 and 2014. The authors found a positive association between state-controlled firms with higher independent boards and risk committee independence. However, the study does not address the impact of risk committee independence on the firms' risk and/or performance indicators.

Nahar and Jahan, (2021) used a sample of 160 banks from different 45 countries for a period from 2006 to 2016, generating a sample of 1,760 observations. The authors found that RC independence positively impact the relationship between bank's performance, measured by Return on Assets (ROA) and Tobin's Q, and bank's risk disclosure. Qureshi and Lamarque,

(2022) examined the impact of RC activity (measured by RC existence, independence, and financial experience) and on the credit risk of Significantly Supervised European Banks (SSEB). The authors investigated the period 2013 to 2017. The study measured credit risk using a proxy of impaired loans ratio of total loans. The authors found that RC activity was insignificant in reducing SSEB's credit risk. However, the impact of RC independence on credit risk was not identified due to the research design and methodology.

3.1.1.d Risk Committee Qualifications and Bank Risk and Performance

Regulators have explicitly stated that risk committee members should have appropriate fiancé and banking qualification and experience (FCA, EBA, (Basel Committee on Banking Supervision and Supervision, 2015). As directors with good knowledge of financial theories, principles, and standards will provide more effective risk oversight and management. Despite of the regulators' emphasis, the existing literature that examines the association between risk committee qualification and banks' performance and/or risk is limited.

Studying Australian financial firms over the period 2006 to 2008, (Tao and Hutchinson, 2013) found that firm's performance improved when risk committee members were professionally qualified, independent, meet more frequently, and have industry experience. The study used Risk Committee Monitoring as an explanatory variable that includes, in addition to qualification, committee size, independence, experience, and activity (number of meetings). This research design does not allow for a direct examination of the relationship between RC qualification and firms performance.

Al-Hadi, Hasan, and Habib, (2016) examined the relationship between risk committee characteristics and risk disclosure in a sample of 677 firm-year observations of financial firms in the Gulf Cooperation Council (GCC) countries for the period 2007-2011. They find that firms with a better risk committee qualification are associated with greater market risk disclosure. Aljughaiman and Salama, (2019), includes RC financial qualification as a one of five variables (in addition to size, Independency, number of meetings, and multi-membership) to capture banks' RC effectiveness. They create a Risk Governance Index (RGI) that includes RC and CRO characteristics. The results show that banks with higher RGI have lower overall risks. However, the RC qualification is not directly investigated due to the research design.

Nahar and Jahan, (2021) used a sample of 160 banks from different 45 countries for a period from 2006 to 2016, generating a sample of 1,760 observations. The authors found that RC

financial expertism (measured by the total number of financial/accounting experts in RC[12]) positively impact the relationship between bank's performance (measured by Return on Assets (ROA) and Tobin's Q) and bank's risk disclosure.

3.1.1.e Risk Committee Meetings and Bank Risk and Performance

Aebi, Sabato and Schmid, (2012) studied 85 US banks during the 2007-2008 financial crisis period. Using three performance measures (Buy-and-Hold Return; ROE, and ROA), they concluded that a more dedicated committee that meets more frequently seems to positively affect the banks' performance in the crisis.

Ellul and Yerramilli, (2013) investigate risk management mechanisms (mainly Risk Committee and Chief Risk Officer characteristics) at a sample of US Bank Holding Companies (BHCs) during the years 1995-2010. The authors create a Risk Management Index (RMI), with Active Risk Committee one of six risk management variables. Active Risk Committees are those who met more frequently in a given year than the average number of meetings in the sample. They found that BHCs that started the financial crisis period with higher RMI score experienced (during the crisis years) lower tail risk, lower percentage of non-performing loans, improved operating performance, and higher annual stock returns in the 2007-2008 financial crisis years.

Studying Australian financial firms over the period 2006 to 2008, Tao and Hutchinson, (2013) found that firm performance improves when having a risk committee (and a compensation committee) constitutes of members who are independent of management, have industry and board experience, are professionally qualified and meet frequently. However, the research design does not allow for a direct examination of the relationship between RC independence and firms performance.

Battaglia and Gallo, (2015) found a positive relationship between RC size and financial performance, measured by Return on Assets (ROA) and Return on Equity (ROE), of 36 Indian and Chinese banks during the period 2007-2011. However, they found that RC number of meetings was positively associated with market valuation, measured by Tobin's Q. Amoozegar, Pukthuanthong and Walker, (2017) constructed a Risk Management Index (RMI), that includes RC variables (RC presence, risk-related experience, and number of meetings), to investigate the impact of RM on banks litigation risk (measured by the number of times a bank was subject to a class action lawsuit). The study used a sample of 432 observations for sued financial institutions for the period 1996 to 2011, and it found that banks with higher RMI

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[12] It is not clear how the authors identified the financial/accounting experts (i.e., using experience and/or qualification).

are less likely to be sued. However, the effect of RC number of meetings solely is not clear due to the research design and methodology that adopt using RMI.

Kweh et al., (2018) studied RC characteristics across 23 Malaysian banks for the post financial crisis period 2008 to 2012. They found that larger RCs lead to improved performance, measured by an efficiency score that captures overall efficiency, managerial efficiency, or profitability efficiency. However, the RC number of meetings had negative association with banks efficiencies.

Aljughaiman and Salama, (2019) create a Risk Governance Index (RGI) constitutes of five risk management variables, one of which is RC number of meetings, for 65 listed Conventional Banks and Islamic Banks in the MENA region for the period 2005 to 2015. They reported that banks with higher RGI have lower overall risks. However, the RC number of meetings is not directly investigated due to the research design.

Abid *et al.*, (2021) used a sample of 1,480 observations for Asian banks from 2010 to 2017 to examine the relationship between bank's risks (including credit, operation, insolvency, and liquidity risks) and risk governance attributes (including RC presence, RC size, RC meetings, CRO presence, and CRO independence). The authors reported that the number of RC meetings has a significant and negative relationship with bank's operational and credit risks. But a significant and positive association with insolvency risk. The relationship between RC meetings and liquidity risk was negative but statistically insignificant.

Nahar and Jahan, (2021) used a sample of 160 banks from different 45 countries for a period from 2006 to 2016, generating a sample of 1,760 observations. The authors found that RC meetings positively impact the relationship between bank performance (measured by Return on Assets (ROA) and Tobin's Q) and bank risk disclosure. Mashamba and Gani, (2022) examined risk governance and risk taking in African banks. The study used a sample of 41 listed banks in 12 African countries for the period 2011 to 2020. The study found that RC meeting frequency has a significantly negative association with bank's risk taking, measured by the ratio of risk-weighted assets to total assets. Qureshi and Lamarque, (2022) examined the impact of RC meetings on the credit risk of Significantly Supervised European Banks (SSEB). The authors investigated the period 2013 to 2017. The study measured credit risk using a proxy of impaired loans ratio of total loans. The authors found that RC meeting was insignificant in reducing SSEB's credit risk.

Considering the mixed results in the literature concerning the impact of establishing a stand-alone risk committee (RC), and its characteristics, on banks' outcomes, it is essential to

analyse the reasons behind these inconsistencies and identify potential gaps that this study will attempt to address.

Literature Limitations/Gaps

Methodological limitations in the studies on the impact of establishing a stand-alone risk committee (RC) on banks' outcomes could contribute to the mixed findings in the literature. Some of these limitations include:

Research Design: Certain studies do not specifically focus on the impact of RC existence and/or characteristics, instead using it as a control variable (Minton et al., 2014; Qureshi and Lamarque, 2022) or using as a component in a risk governance index (Ellul and Yerramilli, 2010; Aljughaiman and Salama, 2019) . These approaches may not provide a comprehensive understanding of the relationship between RC presence and attributes, and bank outcomes. This research will employ research designs that prioritize the investigation of RC existence and attributes to generate more conclusive results.

Measurement of Variables: The measurement of key variables, such as bank performance, risk-taking, and risk disclosure, may vary across studies. The use of different proxies for these variables can lead to inconsistencies in results. In this research, I selected three proxies that are widely used in the literature to measure the main three risks in a bank. Credit risk will be measured by non-performing loan ration, Regulatory risk will be measured by Tier-1 Capital ratio, and Insolvency risk will be measured by the Z-score. ROE will be deployed to measure bank's performance.

Sample Size and Representativeness: Some studies may have limited sample sizes, which can affect the generalizability of the findings. Additionally, the representativeness of the sample may also impact the results. This research includes (241) banks and (966) bank-year observations. Another limitation in the studies on the impact of establishing a stand-alone risk committee (RC) and its characteristics on banks' outcomes is related to the sample selection and period under investigation. The period of investigation varies across studies, with some focusing on the financial crisis period (Aebi et al., 2012; Yeh, 2017) and others considering pre- and post-crisis periods (Aljughaiman and Salama, 2019). The choice of the period may influence the results, as the impact of RC existence could be different during stable times versus crisis periods. My paper investigates the impact of RC existence and characteristics during a stable economic condition which can generate a more robust and consistent findings.

The types of banks included in the sample can also affect the results. Some studies focus on specific categories of banks, such as conventional banks (Aljughaiman and Salama, 2019), Islamic banks (Aslam and Haron, 2020), or financial institutions (Minton et al., 2014). The impact of RC existence and attributes may differ across various types of banks due to differences in their risk profiles, regulatory environments, and business models. This research

focuses on USA commercial banks only to eliminate any variances in the results that may arise because of differences in regulatory environments, and business models.

Use of Composite Indices: Some studies have attempted to capture the impact of RC existence on banks' outcomes by creating composite indices that combine multiple outcome measures, such as the Risk Management Index (RMI). While this approach can provide a more comprehensive assessment of banks' risk management effectiveness, it may also introduce new challenges, such as the weighting and aggregation of different outcome measures. This research will directly investigate the impact of RC existence and characteristics on banks' outcome by deploying the RC attributes as separate explanatory variables in the testing models.

Hypothesis Development

However, in theory, RC presence will ensure sufficient resources and time are allocated by directors to manage and oversight bank's risk leading to lower risk. RC presence will also limit banks from excessive risk taking resulting in a negative association between RC existence and bank's performance. Therefore, the research hypothesises are:

> *H1: Risk Committee presence is negatively associated with Bank's Risks.*
> *H1a: Risk Committee presence is negatively associated with Bank's Performance.*

Consistent with resource dependency theory, most of existing literature seems to support that RC size is beneficial for bank's outcomes (Battaglia and Gallo, 2015; Kweh et al., 2018; Aljughaiman and Salama, 2019; Lee et al., 2020; Abid *et al.*, 2021), as larger Risk Committees have more resources, time, experience, and knowledge, facilitating more effective risk identification, oversight, and management. This is likely to lead to lower risk and higher performance. Consequently, the research hypothesises are:

> *H2: RC size is negatively associated with Bank's Risk.*
> *H2a: RC size is positively associated with Bank's Performance*.

The existing literature provides mixed results about the relationship between RC Independency and banks' risk and/or performance. However, higher percentage of independent directors on a board committee is likely to improve risk oversight by directors over managers leading to a lower risk taking. Also, independent directors are more shareholders-friendly and that should lead to higher returns for equity holders as the RC becomes more independent. Therefore, the research hypothesises are:

> *H3: RC Independence is negatively associated with Bank's Risk.*
> *H3a: RC Independency is positively associated with Bank's Performance*.

Resource dependence theory argues that qualified board members can assist firms to connect more effectively with its external environment and to acquire valuable resources (Pfeffer and Salancik, 1978). Agency theory suggests that qualified board members can improve managerial monitoring (Cabedo and Tirado, 2004) leading to enhanced stakeholder interest. Therefore, the research hypothesises are:

H4: Risk Committee Qualification is negatively associated with Bank's Risk.

H4a: Risk Committee Qualification is positively associated with Bank's Performance.

More frequent meetings indicate that more resources and time are allocated for risk oversight and management discussion which should allow for better problem identification and avoidance. Therefore, the research hypothesises are:

H5: Risk Committee Meeting Frequency is negatively associated with Bank's Risk.

H5a: Risk Committee Meeting Frequency is positively associated with Bank's Performance.

3.2 Design and Methodology

3.2.1 Sample and Data Sources

Firstly, the sample starts by obtaining all listed active companies under the industrial classifications "Banks" in Europe, United States, and Canada from S&P Capital IQ platform. Then, sample filtered by SIC code to include only commercial banks: National Commercial Banks (6021), State Commercial Banks (6022), and Commercial Banks Not Elsewhere Classified (6029). By focusing on commercial banks only, the study will have a homogenous sample with banks that face similar operation and objectives. The study focuses on the banks in the USA to eliminate country-related effects or variances. Also, the USA has one of the most advanced regulatory rules and regulations. Thus, I filtered the data by country to include banks in the USA only. The study focuses on the post-regulation change period from 2016 to 2019. I choose this period as it (1) allows for sufficient period for banks to implement the relevant regulations that was introduced in 2014; (2) this period received least attention in the current literature as most researchers focused on the financial crisis period; and (3) this period ends in 2019 as 2020-2022 years were affected by the Covid-19 pandemic where banks' operations were disrupted due to series of national lockdowns. This leaves a final sample of (241) banks and (966) bank-year observations. Banks consolidated financial variables are in US Dollar and collected from Bloomberg database. Risk Committee variables are hand-collected from banks' websites, annual reports, proxy statements, and 10-K statements.

Table 2: Sample by SIC code and Name.

SIC Code	SIC Name	Number of Banks	%
6021	National Commercial Banks	77	31.95%
6022	State Commercial Banks	161	66.80%
6029	Not Elsewhere Classified Commercial Banks	3	1.24%
Grand Total		241	100%

Table 3: Risk Committee Presence over the sample years.

Year	NO	YES
2016	57%	43%
2017	54%	46%
2018	51%	49%
2019	50%	50%
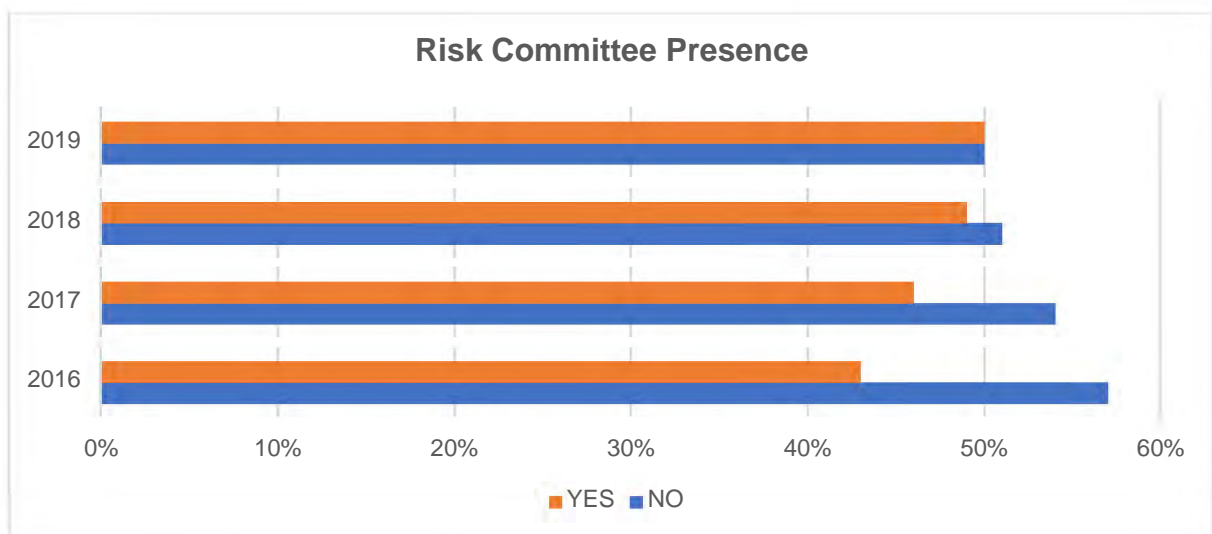
Figure 3: RC presence between 2016 – 2019

3.2.2 Variables Definition and Description

Dependent Variables:

Credit Risk (CR)

While commercial banks (CBs) face operation, interest rate, financial, market, and liquidity risks, Credit Risk remains the most critical risk for CBs evident by regulators efforts to improve capital quality and credit risk management following the financial crisis. As reported by Basel Committee on Banking Supervision (BCBS), low quality credit risk management techniques remain the major cause of banking crises worldwide. Consistent with (Ellul and Yerramilli, 2013) and (Lu and Boateng, 2018), The ratio of Non-Performing Loan (NPL) to total loans (NPLTL) will be deployed to capture bank's credit risk. NPL is calculated as the amount of non-performing loans divided by total loans. Banks' NPL is collected from Bloomberg database (RX370).

Insolvency Risk (IR)

Insolvency risk captures the risk of bank's inability to meet its obligations/debt when they fall due (Lepetit and Strobel, 2015). The Z-score is used widely in the literature to measure insolvency risk and distance from default (Akbar et al., 2017; Mollah et al., 2017; Ramly and Nordin, 2018; Aljughaiman and Salama, 2019). Z-score has an inverse relationship with insolvency risk; thus, higher Z-score value indicates lower exposure to insolvency risk. Following (Aljughaiman and Salama, 2019) and (Mollah et al., 2017), I calculate the Z-score by scaling the total of average return on assets and the capital to total assets ratio to the standard deviation of return on assets; as:

Equation 1: Z-Score

$$Z - SCORE = \frac{\text{ROA} + CAR}{\sigma(ROA)}$$

Standard deviation of return on assets measures the variability in ROA which captures most of bank's interest rate risks, operating risks, and other earning-related risks (Ramly and Nordin, 2018), and that properly explains why the Z-score is a popular insolvency risk measure in the literature.

Regulatory Risk (RR) - Capital Adequacy

Regulators rely heavily on the use of Tier-1 Capital ratio as a measure of bank's capital adequacy and its overall risk of default. Basel 1 in 1988 introduced the first Tier-1 capital (core capital) requirement of a minimum of 4% of risk weighted assets. While Basel II (2007) did not change this minimum requirement, Basel III and Dodd and Frank Act (2010) introduced a new definition of capital: "common equity Tier-1" with a minimum requirement of 4.5%; and Tier-1 Capital ratio increased to 6%. While many researchers deployed the Tier-1 Capital ratio as a control variable ((Ellul and Yerramilli, 2013; Leone, Gallucci and Santulli, 2018; Aljughaiman and Salama, 2019), I, and Following (Iselin, 2020), deploy it as a dependent variable to capture the regulatory risk/impact of the RC characteristics. I collect the Tier-1 Capital to risk weighted assets ratio from Bloomberg database (BS086).

Return On Equity (ROE)

Return on Equity (ROE) is widely used in the banking literature as a proxy to measure banks performance (Aebi, Sabato and Schmid, 2012; Battaglia and Gallo, 2015; Gontarek and Belghitar, 2018). The research employs ROE as an indicator of Bank's performance. I measure ROE as net income available for common shareholders divided by the average book value of total common equity. ROE data are collected from Bloomberg database (RR029).

Return On Asset (ROA)

Return on Asset (ROA) is one of the mostly used profitability measures in the banking literature and as a to measure banks performance (Aebi, Sabato and Schmid, 2012; Battaglia and Gallo, 2015; Nahar, Jubb and Azim, 2016; Nahar and Jahan, 2021). ROA is employed in this research as an indicator of Bank's performance. I measure ROA as Net income before extraordinary items as a percentage of total assets. ROA data are collected from Bloomberg database (RR028).

Explanatory Variables:

Risk Committee Existence (RC_EXS) is a dummy variable that will take a value of 1 if a bank has a risk committee in a specific year and zero otherwise (Aebi, Sabato and Schmid, 2012; Iselin, 2020). I determine if a bank has a stand-alone RC in a given year by searching the word "committee" in the bank's annual report and/or proxy statement for that year and read through it to identify RC existence. Cases where the committee's name includes other functions (like compliance, audit), in addition to risk (e.g., Risk and Audit committee) where classified as non-standalone RC and therefore assigned a zero. Risk Committee Size (RC_SIZE) is determined by the total number of risk committee members for a bank in a specific year (Kweh et al., 2018; Aljughaiman and Salama, 2019). RC_SIZE was collected from banks' annual reports.

Risk Committee Independency (RC_IND) is calculated by dividing the number of independent risk committee members by the total number of risk committee members (Tao and Hutchinson, 2013; Aljughaiman and Salama, 2019). Some banks do not clearly identify if a member is independent or not, in such scenarios, I read through the member's profile to determine if a member is independent or otherwise. And only members with strong evidence to demonstrate their independence were classified as independent members.

Risk Committee Qualification (RC_QUAL) is a dummy variable that take a value of 1 if at least one risk committee member has an academic (finance or accounting bachelor, master, or PhD degree) and/or professional qualification (CPA, CFA, CMA, CIMA, or ACCA) and zero otherwise (Tao and Hutchinson, 2013). I first read through the bank's annual report to identify if RC_QUAL is met; if not, I searched LinkedIn profile of RC members to determine if RC_QUAL condition is satisfied. Risk Committee Meeting Frequency (RC Meetings) is the total number of risk committee meetings held in a given year (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013). I searched bank's annual report for details on the number of RC meetings held in a specific year.

Control Variables:

I control for key corporate governance variables. Board Size (BODS), measured by the number of directors serving in the board. BODS is collected from Bloomberg database (CG600) (Aljughaiman and Salama, 2019). Board Independency (BODIN), the percentage of independent members of the board (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Minton, Taillard, and Williamson, 2014; Aljughaiman and Salama, 2019; Iselin, 2020). BODIN is collected from Bloomberg database (ES063).

The research also controls for bank-level variables. Bank Size (BSIZE), measured by the logarithm of bank's total assets (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Aljughaiman and Salama, 2019). BSIZE is collected from Bloomberg database (BS035). Bank Age (BAGE), measured by number of years since the bank was established (Akbar et al., 2017; Aljughaiman and Salama, 2019; Bhuiyan, Cheema and Man, 2020). BAGE is collected from Bloomberg database. Following previous research (Ellul and Yerramilli, 2013; Hines and Peters, 2015; Aljughaiman and Salama, 2019), I control for Bank Leverage (BLEV), calculated as the ratio of total debt to total equity. BLEV is collected from Bloomberg database (RR732). Loans to Assets (LOAS), measured by total loans value scaled by total assets is used as a control variable reflect bank's risk appetite and loan credit quality (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Gontarek and Belghitar, 2018; Aljughaiman and Salama, 2019). LOAS is collected from Bloomberg database (RR170). Additionally, and in the Risk model only, the study will control for the profitability measure Return on Assets (ROA) calculated as the return on assets scaled by total assets (Ellul and Yerramilli, 2013; Aljughaiman and Salama, 2019). Table 3 summarises all variables definitions and their data source.

3.2.3 Estimation Models

The study conducts three main tasks/tests: (1) descriptive statistics to present the nature, characteristics, and distribution of data; (2) correlation, to present evidence about the relation/association between the key variables; and (3) Ordinary Least Square (OLS) estimator, to show the impact of RC characteristics on Banks' risk taking and performance. OLS estimator has been used in previous studies on bank risk/performance and governance (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Aljughaiman and Salama, 2019; Nahar and Jahan, 2021). I perform subsample analysis based on bank's size to investigate the association between bank risk/performance and risk committee characteristics. The hypothesis H1 to H5 will be tested using the following model:

$$\text{RISKijt} = \alpha_0 + \beta1\text{RCEXTit} + \beta2\text{RC\_SIZEit} + \text{ß3RC\_INDit} + \text{ß4RC\_QUALit} + \text{ß5RCMEETit}$$
$$+ \text{ß6CONTROLSit} + \varepsilon\text{it}$$

The hypothesis H1a to H5a will be tested using the following model:

Equation 3: Equation for Performance

$$\text{PERFORMANCEijt}$$
$$= \alpha_0 + \beta1\text{RCEXTit} + \beta2\text{RC}_{\text{SIZEit}} + \text{ß3RC}_{\text{INDit}} + \text{ß4RC}_{\text{QUALit}} + \text{ß5RCMEETit}$$
$$+ \text{ß6CONTROLSit} + \varepsilon\text{it}$$

Where RISK_{ijt} is the proxy of either credit risk (CR), insolvency risk (IR) or regulatory risk (RR) for bank i at time t; PERFORMANCE_{ijt} is the proxy of either Return on Equity (ROE) or Return on Assets (ROA) which measures the performance of bank i at time t; RCEXT_{it} is the dummy variable for RC existence for bank i at time t; RC_SIZE_{it} is the RC size for bank I at time t; RC_IND_{it} is the RC independence for bank i at time t; RC_QUAL_{it} is the RC qualification for bank i at time t; RCMEET_{it} is the RC number of meetings for bank i at time t; and CONTROLS_{it} are vector of bank level and corporate governance variables for bank i at time t.

Table 4: Variables' definitions, and sources.

Variable	Measurement / Definition	Data Source
NPL Ratio (CR)	Non-performing loan ratio, measured by: Total non-performing loans as a percentage of total loans.	Bloomberg database (RX370)
Z-score (IR)	Bank distance to default is computed as sum of the return on assets and capital ratio, divided by the standard deviation of the return on assets. Z-score = (ROA + CAR) / σ (ROA)	Bloomberg database
Tier-1 Capital Ratio (RR)	Total Tier-1 Capital as a percentage of risk-weighted total assets.	Bloomberg database (BS086)
Return On Equity	ROE, measured as net income available to common shareholders as a percentage of total common equity	Bloomberg database (RR029)
Return on Assets	Net income before extraordinary items as a percentage of total assets.	Bloomberg database (RR028)
RC Existence	Dummy variable takes value of 1 if the bank has a dedicated RC and 0 otherwise	Annual Reports/Proxy Statements
RC Size	Total number of directors serving on the RC in a given year	Annual Reports/Proxy Statements
RC Independence	Percentage of independent RC members of the total number of members	Annual Reports/Proxy Statements
RC Qualification	1 if at least one risk committee member has an academic (finance or accounting bachelor, master, or PhD degree) and/or professional qualification (CPA, CFA, CMA, CIMA, or ACCA) and zero otherwise.	Annual Reports/LinkedIn
RC Meetings	Number of full RC meetings held during the year	Annual Reports/Proxy Statements
Board Size	Number of members in the Board	Bloomberg database (CG600)
Board Independence	Percentage of independent members of the total number of members in the Board	Bloomberg database (ES063)
Loan To Assets	Total loans as a percentage of total assets.	Bloomberg database (RR170)
Bank Size	Natural logarithm of the book value of total assets.	Bloomberg database (BS035)
Bank Leverage	Leverage ratio measured by total debt to equity.	Bloomberg database (RR732)
Bank Age	The difference between the sample year and the year in which the bank was incorporated.	Bloomberg database

3.3 Data Analysis

3.3.1 Univariate Analysis

The summary statistics for the dependent variables, risk committee characteristics, and control variables are provided in Table 4. The sample is segmented into large banks and small banks; based on total assets size. I used $10 billion as a cut-off point (consistent with regulatory directions), thus, banks with total assets greater than or equal to $10 billion are classified as large, otherwise small banks.

The results suggest that large banks have significantly lower credit risk than smaller banks. The average mean value for NPL, the proxy for measuring credit risk, is 0.536% and 0.589% for large and small banks respectively. Contradictory, smaller banks have significantly higher Tier-1 capital ratio (a proxy for measuring Regulatory Risk, RR) than larger banks, the mean value for Tier-1 capital ratio for smaller banks is 13.137% compared to 11.985% for larger banks. The sample shows that both sup-sample groups to maintain sufficient Tier-1 capital ratio that is almost double the regulatory requirement of 6%. Z-Score has an inverse relationship with solvency risk. The difference between mean values for Z-score for small and large banks is insignificant. The mean values for this insolvency measure are 0.309 and 0.303 for large and small banks respectively. Large banks reported slightly better performance, with an average ROE of 10% compared to a mean value for ROE of 9.6% for small banks; and an average ROA of 1.2% and 1% for large and small banks respectively.

The mean value of risk committee existence (RC_EXS) for the entire sample is 46.8%. There is a significant difference between the mean value of RC_EXS for large banks (88.5%) and small banks (31.1%). This is expected as large banks (total assets > $10 Billion) are legally required to establish a standalone risk committee. However, the data shows that only one third of small banks voluntarily established standalone risk committee.

Both large and small banks have a relatively large board of directors. Mean value of board size (BODS) is 11.65 for the full sample, 12.84 for large banks, and 11.33 for small banks. The results suggest that banks tend to have independent boards. The mean value of board independency (BODIN) is 82%, with no significant difference between the mean value for large banks (83%) and the mean value for small banks (81%). The sample represent a very well-established banks with the average bank age (BAGE) 29 years for the full sample. Larger banks have slightly higher mean BAGE of 35 years compared with a BAGE mean value of 28 years for smaller banks. The mean value for debt-to-equity ratio, the measure of bank's leverage (BLEV), is 74.5% for the full sample. Larger banks are more leveraged with a mean value of 84.5% compared to a mean value of 71.6% for small banks. The results show that

smaller banks have higher risk appetite. The mean value for loans to assets ratio (LOAS), a measure of risk appetite, for small banks is 71% compared to a LOAS mean value of 66% for large banks. Banks' profitability, measured by ROA, is not significantly different between large and small banks. ROA mean value is 0.98% and 0.91% for large and small banks respectively.

Table 5 presents the variances in dependent and control variables among banks with RC and banks without RC. The results indicate that banks with RC have higher credit risk of 0.584 compared to 0.566 for banks without RC, however, the difference is insignificant. Banks with RC have lower, but insignificant, insolvency risk as their Z-score was higher by 0.02 points. Banks with RC have a Z-score of 0.315 while banks without RC have a Z-score of 0.295. ROE for banks with RC (9.762) is insignificantly higher than ROE for banks without RC (9.682). However, banks without RC have a significantly higher Tier1-capital ratio (13.137) compared to banks without RC (12.457). The data suggests that banks with RC are significantly larger than banks without RC. The log total assets for banks with RC is 23.197 compared with 21.583 for banks without RC. Banks with RC are significantly older than banks without RC as the average bank age is 32 and 27 years for banks with RC and banks without RC respectively. Banks with RC are more leveraged with Debt-to-Equity ratio of 77% compared to a Debt-to-Equity ratio of 72% for banks without RC. Boarder size is significantly larger for banks with RC with an average board size of 12.4 members compared to an average board size of 11 members for banks without RC. Both banks with and without RC enjoy relatively high independent boards. Albeit not significant, the banks with RC have more independent boards with 82.7% independent directors compared to 81.1% independent directors for banks without RC. Banks with RC also enjoyed significantly higher ROA of 1.1% compared with only 1% for banks without RC.

For RC characteristics, I focus on banks with established risk committee only. This will eliminate the bias caused by including banks who did not have a standalone risk committee. Table 6 summarises mean values of RC characteristics for small and large banks with RC. Albeit it insignificant, large banks have slightly larger RCs than smaller banks. The mean values of risk committee size (RC_SIZE) for banks in these sub-samples are 5.6 and 5.4 for large and small banks respectively. Expectedly, both groups (large and small banks) reports highly independent RCs. The mean value of risk committee independence (RC_IND) for large banks 93% compared to 95% in small banks. RCs are formed by Banks' Boards, which have high independent boards: 82.4% and 81.6% for large _and small banks respectively. There is a significant difference between the mean value of RC_QUAL for large banks (69%) and small banks 59%). RCs in larger banks met more frequently. Average number of RC meetings

(*Meeting_Number*) for large banks (6.45) is (although it is insignificant) higher than the average number of meetings for small banks (6.05).

Table 5: Descriptive Statistics

| Variables | Full Sample | | | | | Skewness | | Kurtosis | | Large Banks: Sample Mean | Small Banks: Sample Mean | p Value |
	N	Mean	Min	Max	Std. Deviation	Statistic	Std. Error	Statistic	Std. Error			
Dependent Variables												
CR	938.000	0.574	0.000	3.270	0.439	1.672	0.080	4.238	0.160	0.536	0.589	0.046
IR	913.000	0.305	-0.066	3.721	0.349	3.536	0.081	20.870	0.162	0.309	0.303	0.777
RR	938.000	12.815	6.000	25.420	2.370	1.511	0.080	4.016	0.160	11.985	13.137	0.000
ROE	942.000	9.720	-31.179	30.464	3.702	-2.522	0.080	30.477	0.159	9.995	9.614	0.117
ROA	942.000	1.063	-3.145	4.453	0.409	-1.185	0.080	20.474	0.159	1.184	1.017	0.000
Risk Committee Variables												
RC_EXS	966.000	0.468	0.000	1.000	0.499	0.129	0.079	-1.988	0.157	0.885	0.310	0.000
RC_SIZE	966.000	2.584	0.000	12.000	3.003	0.639	0.079	-0.870	0.157	4.947	1.674	0.000
RC_IND	966.000	0.439	0.000	1.000	0.477	0.206	0.079	-1.906	0.157	0.823	0.295	0.000
RC_QUAL	966.000	0.300	0.000	1.000	0.459	0.873	0.079	-1.240	0.157	0.612	0.183	0.000
Meeting_Number	945.000	2.850	0.000	20.000	3.718	1.212	0.080	1.057	0.159	5.698	1.774	0.000
Control Variables												
BODS	966.000	11.651	4.000	33.000	3.058	1.606	0.079	8.652	0.157	12.935	11.213	0.000
BODIN	910.000	81.90	33.333	94.118	10.072	-1.267	0.081	2.241	0.162	82.439	81.606	0.309
LOAS	946.000	70.161	20.049	89.095	10.314	-1.164	0.080	2.061	0.159	67.003	71.370	0.000
LOG_TA	946.000	22.340	19.721	28.623	1.561	1.145	0.080	2.025	0.159	24.412	21.532	0.000
BLEV (D/E)	946.000	74.578	0.000	439.732	53.734	1.247	0.080	3.109	0.159	78.439	73.099	0.141
BAGE	966.000	29.401	0.000	133.000	16.483	2.108	0.079	9.174	0.157	33.863	27.712	0.000

Table 6: Univariate comparison of risk committee presence

	Risk Committee Existence		
Variable	Yes	No	P Value
CR	0.584	0.566	0.548
IR	0.315	0.295	0.386
RR	12.457	13.137	0.000
ROE	9.762	9.682	0.743
ROA	1.103	1.028	0.005
Board Size	12.392	11.000	0.000
IND Directors%	82.722	81.155	0.019
Log TA	23.197	21.583	0.000
Bank Age	32.241	26.903	0.000
DE	77.252	72.213	0.150
TotalLoansTotalAssets	69.580	70.675	0.103

Table 7: Mean values of RC characteristics for banks with RC

Risk Committee Variables	Large Banks: Sample Mean	Small Banks: Sample Mean	p Value
RC_SIZE	5.59	5.4	0.260
RC_IND	0.93	0.95	0.088
RC_QUAL	0.69	0.59	0.036
Meeting_Number	6.45	6.05	0.169

Table 8: Pearson pairwise correlation matrix: full sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CR	1															
IR	-.066*	1														
RR	.100**	0.042	1													
ROE	-.210**	.165**	-0.002	1												
RCEX	0.020	0.029	-.144**	0.011	1											
RCSIZE	0.053	0.037	-.128**	0.010	.918**	1										
RCIND	0.032	0.028	-.138**	0.009	.982**	.894**	1									
RCQUAL	.090**	-0.016	-.169**	0.009	.698**	.662**	.694**	1								
RCMEET	0.027	0.019	-.147**	0.028	.837**	.794**	.826**	.589**	1							
BODS	-0.032	0.025	-.149**	-0.024	.227**	.250**	.197**	.156**	.229**	1						
BODIN	0.001	0.026	-.069*	-0.007	.078*	.115**	.108**	0.032	.139**	0.001	1					
LOAS	-.069*	-0.037	-.418**	.085**	-0.053	-.080*	-0.062	.075*	-0.050	-0.038	-0.001	1				
ROA	-.182**	.171**	.144**	.851**	.092**	.086**	.083*	.064*	.070*	0.052	-0.059	0.042	1			
Log-TA	-.119**	.070*	-.246**	.122**	.516**	.498**	.506**	.363**	.555**	.317**	.107**	-.216**	.214**	1		
BLEV	0.008	0.051	-.223**	-0.043	0.047	0.059	0.057	0.004	.117**	0.020	.103**	0.007	-.225**	.229**	1	
BAGE	-0.043	0.047	0.048	.068*	.162**	.147**	.177**	0.063	.153**	.065*	.145**	-.254**	.069*	.250**	.082*	1

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

Table 9: Mean values for banks with RC based on RC characteristics.

Variable	RC Size		RCIND		RCQUAL		RCMEET	
	≥ 5	< 5	≥ 0.5	< 0.5	With QUAL	Without QUAL	≥ 6	< 6
CR	0.625*	0.497	0.588**	0.198	0.634*	0.492	0.585	0.557
IR	0.324	0.297	0.314	0.382	0.296	0.350	0.305	0.322
RR	12.327***	12.723	12.463**	10.623	12.210*	12.898	12.276	12.584
ROE	9.533***	10.231	9.752	10.623	9.772	9.743	9.624	9.882

* Significant at 1%

** Significant at 5%

*** significant at 10%

Table 10: Pearson pairwise correlation matrix for RC characteristics and independent variables: Banks with RC

Variable	1	2	3	4	5	6	7	8
CR	1							
IR	-0.049	1						
RR	0.001	0.048	1					
ROE	-.222**	.108*	0.000	1				
RCSIZE	.136**	0.034	0.015	0.000	1			
RCIND	.101*	0.001	0.019	-0.009	-0.092	1		
RCQUAL	.164**	-0.068	-.141**	0.003	0.073	0.064	1	
RCMEET	0.065	-0.006	-0.061	0.046	.098*	0.010	0.015	1

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

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

3.3.2 Multivariate Analysis

This study employs four regression models (Ordinary Least Square (OLS), Fixed Effect, Generalized Method of Moments (GMM), and Generalised Least Square (GLS)) to understand the relationship between RCs characteristics (independent variables) and five dependent variables. In line with the methodology proposed by Roberts and Whited (2012), a Hausman test was carried out to determine the suitability of Random Effects (RE) versus Fixed Effects (FE), under the null hypothesis that unique errors are related to the predictors. The results of this test were statistically significant, leading to the adoption of Fixed Effects for this analysis. The ability to control for unseen heterogeneity among banks is one of the main strengths of fixed effects analyses. In keeping with precedents set in other US Banks and risk governance studies, such as those conducted by Ellul and Yerramilli (2013), and Bhagat and Bolton (2014), fixed effects are utilized in this research.

The dependent variables are credit risk (as measured by NPLTL), insolvency risk (as measured by Z-score), regulatory risk (as measured by Tier-1 Capital ratio), and bank

performance (as measured by return on equity (ROE) and return on assets (ROA)). The statistical significance of various variables with respect to the dependent variable is indicated by the p-values. The regression coefficients as well as the standard errors are also provided for each of the regression models (tables 11-15)[13]. A negative value of the regression coefficient indicates an inverse relationship between the dependent variable and independent variable while a positive value indicates a direct relationship. The analysis is provided below as per each independent variable (RC characteristic): Risk Committee Existence, Risk Committee Size, Risk Committee Independence, Risk Committee Qualifications, and Risk Committee Meetings.

RC Existence:

The existence of a risk committee is negatively associated with Credit risk. The relationship is statistically significant at 1% level (-0.489***). The relationship tends to be robust given that it is statistically significant Fixed Effects and GLS models. This negative association indicates that the presence of a risk committee might contribute to better credit risk management leading to a lower credit risk. This result supports the Hypothesis (H1). The findings is consistent with the Agency theory and the results of Aljughaiman and Salama, (2019), and Abid *et al.*, (2021) who argued that the existence of a dedicated risk committee ensures sufficient resources are deployed to risk management and that can lead to more effective risk management and lower credit risk. Having a separate risk committee may allow banks to focus more on risk management issues, leading to better decision-making and monitoring of credit risk exposures. Also, this is aligned with the findings of Yeh (2017) who found that for Japanese banks the risk committee presence is effective in monitoring and controlling of risks.

The results show no relationship between RC existence and Regulatory risk, measured by Tier-1 Capital ratio. The results do not support the hypothesis (H1). the existence of a risk committee may not directly influence regulatory risk as measured by Tier-1 Capital ratio. The Tier-1 Capital ratio is a measure of a bank's financial strength from a regulator's point of view, and it may be influenced by various other factors including the bank's overall strategy, profitability, and the economic environment. The outcome is consistent with the findings of (Aebi, Sabato and Schmid, 2012; Minton, Taillard, and Williamson, 2014; Hines and Peters, 2015).

The coefficients for RC existence and Z-score suggest that there is no association between RC existence and insolvency risk. The results do not support the hypothesis (H1). A critical examination of the relationship between RC existence and bank's performance reveals that

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[13] Full tables for all models are provided in the appendix.

the existence of a risk committee (RC) does not impact bank's performance. The results do not support the hypothesis (H1a). However. The findings are aligned with the results of (Aebi, Sabato and Schmid, 2012; Minton, Taillard, and Williamson, 2014; Hines and Peters, 2015). Therefore, the findings do not support neither: (1) the existing literature that argues that RC existence will reduce the bank's manager risk taking leading to lower return/profit (Zemzem and Kacem, 2014; Hines *et al.*, 2015; Akbar *et al.*, 2017; Elamer and Benyazid, 2018; Aslam and Haron, 2020); nor (2) the literature that suggests that the presence of a risk committee may lead to better risk management practices, reducing the likelihood of financial distress and improving firm performance (Yeh, 2017; Aljughaiman and Salama, 2019; Iselin, 2020; Abid *et al.*, 2021; Azim and Nahar, 2021; Nahar and Jahan, 2021; Nguyen, 2022).

The lack of statistical significance may suggest that the relationship between RC existence and regulatory risk, insolvency risk, and performance is influenced by other factors, such as the quality of risk management practices, corporate governance structures, or the regulatory environment, which are not captured by the models. The non-significance of RC Existence in the analysis could be due to several reasons. Firstly, the mere existence of a risk committee may not guarantee its effectiveness in managing risks. The quality of risk management practices and the risk committee's composition may be more important factors influencing a firm's financial performance (Beasley et al., 2000; Klein, 2002). Secondly, the negative relationship between RC Existence and ROE could reflect endogeneity. Firms experiencing financial difficulties or facing higher risks may be more likely to establish risk committees to address these challenges. Consequently, the negative relationship observed might be due to the higher risks faced by firms with risk committees, rather than the direct impact of the risk committees themselves.

RC Size:

Risk committee size shows a positive and significant relationship with credit risk, indicating that larger risk committees may be associated with higher credit risk. This positive and significant relationship between risk committee size and Credit risk (measured by NPLTL) contrasts with Hypothesis (H2) and the existing literature, which suggest that larger committees could be more effective in managing risks due to a broader range of expertise and perspectives (Lee et al., (2020), Galletta, Mazzù and Scannella, (2021). Also, the results are not aligned with the resource dependence theory. Therefore, in my study, the banks take on higher credit risks as the size of the committee increased. The positive relationship found in the analysis could be attributed to the "too many cooks spoil the broth" phenomenon (Jensen, 1993), where larger committees might experience coordination and communication difficulties, leading to less effective risk management and higher credit risk.

The results suggest that there is no association between RC Size and regulatory risk, measured by Tier-1 capital ratio. This outcome does not support the hypothesis (H2). The results are consistent with the findings of Gontarek and Belghitar, (2018). It is possible that the relationship between RC Size and Tier-1 Capital ratio is more complex and nonlinear, which would not be captured by the linear models employed in this analysis.

According to the findings, there is no relationship between RC Size and insolvency risk. This indicates that an increase in the size of the RC might not be associated with a decrease in insolvency risk. The findings do not support the hypothesis (H2), but it is consistent with the findings of Gontarek and Belghitar, (2018).

A more critical analysis of the relationship between RC Size and ROE reveals that the size of the risk committee (RC) is not associated with bank's performance using both ROE and ROA measures. The results do not support (H2a). However, these results are aligned with the outcomes of Gontarek and Belghitar, (2018) and Nahar and Jahan, (2021).

RC Independence:

The analysis suggests that RC independence could be the least significant characteristics in a CR as it has no association with any of the risk or performance measures in the models. This finding does not support Hypothesises (H3) nor (H3a). However, the results are consistent with the findings of Qureshi and Lamarque, (2022) who found no significant relationship between RC characteristics including independence and credit risk.

RC Qualification:

The analysis reveals a positive and significant relationship between risk committee qualification and credit risk. The relationship is statistically significant at 1% level. The relationship is also significant in the Fixed and GLS models indicating a robust relationship between the two variables. These findings indicate that banks with better-qualified risk committees experience higher levels of credit risk, which contradicts resource independence theory and Hypothesis (H4). Also, it seems counterintuitive and opposes the existing literature. The extant literature generally posits that better-qualified risk committees should be associated with lower credit risk due to their ability to make more informed decisions, manage risk more effectively, and provide better oversight of management activities (Erkens et al., 2012). However, the findings suggest a different (unique) relationship, which might be attributed to several factors. First, it is possible that higher qualifications may lead to overconfidence in risk committee members, which could result in them taking on higher levels of credit risk (Malmendier and Tate, 2005). Overconfidence in their abilities might lead risk committees to underestimate the potential risks associated with their lending decisions,

ultimately leading to higher credit risk exposure. Second, better-qualified risk committee members might be more likely to be targeted by banks with higher inherent credit risk, as these banks may seek to improve their risk management capabilities by attracting highly qualified members.

RC Qualification seems to have no impact on bank's regulatory risk, insolvency risk, or performance. The outcome does not support the hypothesis (H4) or hypothesis (H4a).

RC Meetings

The results in Table 8 show a positive and significant relationship between the number of risk committee meetings and NPLTL, a proxy to measure credit risk. The relationship is statistically significant at 5% level. The relationship is also statistically significant in the Fixed model, indicating a robust relationship between the two variables. These findings suggest that an increased frequency of risk committee meetings is associated with higher credit risk levels, which contradicts the hypothesis (H5) and it is not in line with some studies in the existing literature. The extant literature generally argues that a higher frequency of risk committee meetings should lead to better risk oversight and, consequently, lower credit risk (Vafeas, 1999; Adams and Mehran, 2012). Regular meetings provide committees with more opportunities to discuss risk management strategies, review risk exposures, and monitor management's actions, which should help reduce credit risk exposure (Lipton and Lorsch, 1992; Anderson et al., 2004). However, the findings indicate a different relationship, and consistent with the findings of Mulia, Leon, and Purba (2022) who argue that when the number of meetings of risk committee increases, it enables the bank to take greater credit risk when it advances stake holder interests. One possible explanation for the observed positive relationship between the number of risk committee meetings and credit risk is that banks experiencing higher levels of credit risk might schedule more frequent risk committee meetings as a response to the increased risk exposure. In this case, the observed relationship could be a result of reverse causality, where higher credit risk leads to more frequent meetings rather than the other way around (Bhagat and Bolton, 2008). Another potential explanation is that increased meeting frequency may not necessarily translate into better risk management if the meetings are not conducted effectively. Factors such as meeting duration, quality of discussions, and the implementation of decisions made during meetings could influence the effectiveness of risk committee meetings in managing credit risk. Moreover, if risk committee members are overwhelmed by the number of meetings, their ability to provide effective oversight could be diminished, leading to higher credit risk exposure.

The analysis suggests that there is a positive relationship between the number of RC Meetings and the Tier-1 Capital ratio (a proxy for regulatory risk). The association is statistically

significant at 5% level. The robustness of the relationship is confirmed by both the Fixed Effects and GLS models with both models yielding a statistically significant outcomes at 5% level. This positive relationship suggests that an increase in the number of RC Meetings may be associated with a higher Tier-1 Capital ratio, implying lower regulatory risk. In other words, more frequent RC meetings might be linked to better risk management and reduced regulatory risk which supports the hypothesis (H5). The findings are consistent with the results of Ellul and Yerramilli, (2013), Abid *et al.,* (2021), and Mashamba and Gani, (2022) The results suggest that increased meeting frequency might foster better communication and collaboration among RC members and between the RC and the bank's management, leading to more effective decision-making and risk mitigation.

The results show that RC meeting tends to have no relationship with insolvency risk. This finding does not support the hypothesis (H5). The results also suggest that RC meeting has no impact on bank's performance. This does not support the hypothesis (H5a). This could be because the RC committee main task is to manage and mitigate risks rather than improve performance and profitability.

The non-significance association of some RC characteristics and some dependent variables in the analysis is common in the risk governance literature (Gontarek and Belghitar, (2018), Qureshi and Lamarque, (2022)). However, it could be attributed to several factors. Firstly, it is possible that the examined RC attribute alone is not enough to ensure effective risk management and oversight, and improved performance; other factors, such as the committee members' expertise, and the quality of interactions between committee members, may play a more significant role in influencing a bank's risk management practices and financial performance (Vafeas, 1999; Beasley et al., 2000). Secondly, there might be a non-linear relationship between the studied RC attribute and the dependent variables. Lastly, the non-significant relationship between RC attributes and bank's risk and performance may also be due to the sample selection and methodology used in this study. Other variables that are not included in the analysis may have a more substantial impact on banks' risk and performance, thereby masking the potential influence of RC attributes.

Notably, the OLS and Fixed Effects models are yielding the same coefficient values for ROE, and the same coefficient values for ROA. The reason could be because there might not be any significant characteristics unique to each bank that are systematically related to the RC characteristics.

Table 11: Regression results for the relationship between NPLTL and RC characteristics

VARIABLES	OLS NPLTL	Fixed NPLTL	GMM NPLTL	GLS NPLTL
RC Size	0.0412***	0.0391***	-0.0146	0.0391***
	(-0.0123)	(-0.0122)	(-0.0227)	(-0.0122)
RC Existence	-0.489***	-0.471***	-0.174	-0.471***
	(-0.18)	(-0.18)	(-0.442)	(-0.18)
RC Independence	0.196	0.185	0.263	0.185
	(-0.163)	(-0.163)	(-0.412)	(-0.163)
RC Qualification	0.136***	0.136***	0.266*	0.136***
	(-0.0422)	(-0.0421)	(-0.142)	(-0.0421)
RC Meetings	0.0134**	0.0141**	0.00225	0.0141**
	(-0.00681)	(-0.00678)	(-0.0127)	(-0.00678)
Log_TA	-0.0387***	-0.0403***	-0.219*	-0.0403***
	(-0.012)	(-0.0119)	(-0.114)	(-0.0119)
DE	-0.0001	-0.0000475	-0.00154**	-0.0000475
	(-0.000276)	(-0.000274)	(-0.000614)	(-0.000274)
ROA	-0.156***	-0.168***	-0.00949	-0.168***
	(-0.0376)	(-0.0355)	(-0.0445)	(-0.0355)
Board_Size	-0.0022	-0.00185	0.00415	-0.00185
	(-0.00503)	(-0.00501)	(-0.0143)	(-0.00501)
IND_DIR	-0.000647	-0.000766	-0.000577	-0.000766
	(-0.00141)	(-0.0014)	(-0.00427)	(-0.0014)
Bank_Age	-0.000991	-0.00113	-0.0132	-0.00113
	(-0.000921)	(-0.000916)	(-0.0155)	(-0.000916)
TotalLoansTotalAssets	-0.00344**	-0.00382***	-0.0131**	-0.00382***
	(-0.00143)	(-0.00142)	(-0.00532)	(-0.00142)
Year	Yes	Yes	Yes	Yes
Constant	1.988***	1.992***	6.689***	1.992***
	(-0.297)	(-0.296)	(-2.414)	(-0.296)
Observations	878	878	659	878
R-squared	0.095	0.013	0.097	0.095
Number of ID			228	230

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 12: Regression results for the relationship between Tier-1 Capital Ratio and RC characteristics

VARIABLES	OLS Tier_1_Cap	Fixed Tier_1_Cap	GLS Tier_1_Cap	GMM Tier_1_Cap
RC Size	-0.0628	-0.0671	-0.0671	-0.0346
	(-0.0566)	(-0.0559)	(-0.0559)	(-0.1050)
RC Existence	0.569	0.803	0.803	0.0628
	(-0.7900)	(-0.8200)	(-0.8200)	(-2.0440)
RC Independence	-0.518	-0.567	-0.567	-0.406
	(-0.7030)	(-0.7430)	(-0.7430)	(-1.9020)
RC Qualification	-0.164	-0.263	-0.263	0.486
	(-0.2570)	(-0.1920)	(-0.1920)	(-0.6660)
RC Meetings	0.0677**	0.0681**	0.0681**	0.0177
	(-0.0320)	(-0.0310)	(-0.0310)	(-0.0585)
Log_TA	-0.565***	-0.568***	-0.568***	-1.713***
	(-0.0817)	(-0.0545)	(-0.0545)	(-0.2770)

	OLS	Fixed	GMM	GLS
DE	-0.00550***	-0.00293**	-0.00293**	-0.00753***
	(-0.0013)	(-0.0013)	(-0.0013)	(-0.0029)
ROA	0.825***	1.204***	1.204***	0.890***
	(-0.1150)	(-0.1620)	(-0.1620)	(-0.2220)
Board_Size	-0.0103	-0.0516**	-0.0516**	0.0869
	(-0.0299)	(-0.0229)	(-0.0229)	(-0.0657)
IND_DIR	0.00301	-0.00247	-0.00247	-0.000138
	(-0.0081)	(-0.0064)	(-0.0064)	(-0.0197)
Bank_Age	2.64E-06	-0.00299	-0.00299	0.0434
	(-0.0072)	(-0.0042)	(-0.0042)	(-0.0647)
TotalLoansTotalAssets	-0.108***	-0.113***	-0.113***	-0.108***
	(-0.0090)	(-0.0065)	(-0.0065)	(-0.0248)
Constant	32.36***	33.17***	33.17***	51.08***
	(-1.9830)	(-1.3510)	(-1.3510)	(-6.4120)
Observations	876	876	876	657
R-squared	0.172	0.137	0.127	0.125
Number of ID	228		228	226

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Table 13: Regression results for the relationship between Z-score and RC characteristics

	OLS	Fixed	GMM	GLS
VARIABLES	Z-score	Z-score	Z-score	Z-score
RC Size	0.00792	-0.0181	0.00974	0.0104
	(-0.0102)	(-0.0220)	(-0.0307)	(-0.00964)
RC Existence	0.0266	0.265	0.269	-0.0173
	(-0.1530)	(-0.3140)	(-0.6070)	(-0.145)
RC Independence	-0.0404	-0.216	-0.191	-0.000255
	(-0.1390)	(-0.2690)	(-0.5650)	(-0.132)
RC Qualification	-0.0393	-0.068	-0.0504	-0.0415
	(-0.0353)	(-0.1250)	(-0.1760)	(-0.0333)
RC Meetings	-0.0018	0.0247*	0.0135	-0.00205
	(-0.0057)	(-0.0129)	(-0.0171)	(-0.00537)
Log_TA	-0.00398	-0.241**	-0.0373	-0.00485
	(-0.0100)	(-0.1120)	(-0.1540)	(-0.00943)
DE	0.000537**	0.0000216	-0.000654	0.000542**
	(-0.0002)	(-0.0005)	(-0.0008)	(-0.000224)
ROA	0.174***	0.071	-0.0132	0.210***
	(-0.0298)	(-0.0432)	(-0.0613)	(-0.0297)
Board_Size	0.000524	0.00301	0.0162	0.0000039
	(-0.0042)	(-0.0150)	(-0.0193)	(-0.00396)
IND_DIR	0.000739	0.00427	0.00417	0.000777
	(-0.0012)	(-0.0037)	(-0.0057)	(-0.00112)
Bank_Age	0.00042	0.019	0.0405***	0.00061
	(-0.0008)	(-0.0173)	(-0.0137)	(-0.000743)
TotalLoansTotalAssets	-0.000832	-0.00616	-0.00284	-0.000305
	(-0.0012)	(-0.0052)	(-0.0072)	(-0.00115)
Constant	0.148	5.080**	-0.457	-0.129***
	(-0.2480)	(-2.3080)	(-3.3230)	(-0.0306)
Observations	861	861	642	861
R-squared	0.046	0.021	0.012	0.023
Number of ID		225	223	225

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Table 14: Regression results for the relationship between ROE and RC characteristics

VARIABLES	OLS ROE	Fixed ROE	GMM ROE	GLS ROE
RC Size	-0.751	-0.751	-1.789	-0.710
	(1.584)	(1.584)	(1.665)	(1.636)
RC Existence	0.0182	0.0182	0.280**	0.0275
	(0.108)	(0.108)	(0.115)	(0.112)
RC Independence	-0.121	-0.121	2.050	-0.131
	(1.436)	(1.436)	(1.511)	(1.483)
RC Qualification	-0.295	-0.295	-0.282	-0.285
	(0.370)	(0.370)	(0.395)	(0.383)
RC Meetings	0.0388	0.0388	-0.0164	0.0190
	(0.0598)	(0.0598)	(0.0632)	(0.0617)
Log_TA	0.492***	0.492***	-0.320***	0.558***
	(0.101)	(0.101)	(0.107)	(0.104)
DE	-0.00508**	-0.00508**	0.000205	-0.00751***
	(0.00234)	(0.00234)	(0.00253)	(0.00239)
Board_Size	-0.0984**	-0.0984**	-0.0178	-0.0970**
	(0.0442)	(0.0442)	(0.0470)	(0.0456)
IND_DIR	-0.00784	-0.00784	-0.00302	-0.00666
	(0.0123)	(0.0123)	(0.0130)	(0.0127)
Bank_Age	0.0131	0.0131	-0.00800	0.0169**
	(0.00808)	(0.00808)	(0.00851)	(0.00833)
TotalLoansTotalAssets	0.0421***	0.0421***	0.0155	0.0512***
	(0.0125)	(0.0125)	(0.0131)	(0.0128)
Year	Yes		Yes	Yes
Constant	-2.900	-2.122	15.81***	-4.250
	(2.590)	(2.605)	(2.746)	(2.670)
Observations	879	879	851	879
R-squared	0.126	0.040	0.038	0.017

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 15: Regression results for the relationship between ROA and RC characteristics

VARIABLES	OLS ROA	Fixed ROA	GMM ROA	GLS ROA
RC Size	0.00969	0.00969	0.292	0.0149
	(0.163)	(0.163)	(0.184)	(0.171)
RC Existence	-0.00200	-0.00200	0.0209	-0.0006
	(0.0111)	(0.0111)	(0.0127)	(0.0116)
RC Independence	-0.00676	-0.00676	-0.193	-0.00988
	(0.148)	(0.148)	(0.167)	(0.155)
RC Qualification	-0.0453	-0.0453	-0.0789*	-0.0436
	(0.0381)	(0.0381)	(0.0437)	(0.0399)
RC Meetings	-0.00402	-0.00402	-0.00617	-0.00657
	(0.00615)	(0.00615)	(0.00698)	(0.00644)
Log_TA	0.0888***	0.0888***	-0.0287**	0.0972***
	(0.0104)	(0.0104)	(0.0118)	(0.0108)
DE	-0.00196***	-0.00196***	-0.000102	-0.00227***
	(0.000240)	(0.000240)	(0.000279)	(0.000249)
Board_Size	-0.00539	-0.00539	-0.00124	-0.00528
	(0.00454)	(0.00454)	(0.00519)	(0.00476)
IND_DIR	-0.00266**	-0.00266**	-0.00121	-0.00250*
	(0.00127)	(0.00127)	(0.00144)	(0.00133)
Bank_Age	0.000674	0.000674	-0.00151	0.00117

	(0.000832)	(0.000832)	(0.000941)	(0.000869)
TotalLoansTotalAssets	0.00460***	0.00460***	0.00237	0.00574***
	(0.00128)	(0.00128)	(0.00145)	(0.00133)
Year	Yes	Yes	Yes	Yes
Constant	-0.913***	-0.810***	1.650***	-1.083***
	(0.266)	(0.268)	(0.303)	(0.278)
Observations	879	879	851	879
R-squared	0.240	0.132	0.041	0.032

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

In summary:

Table 16: Summary of relationships among RC characteristics and dependant variables

RC Characteristics	Credit Risk		Regulatory Risk		Insolvency Risk		Performance	
	Association	Significance	Association	Significance	Association	Significance	Association	Significance
RC Existence	-	Yes	-	No	-	No	-	No
RC Size	+	Yes	+	No	-	No	+	No
RC Independence	+	No	+	No	+	No	+	No
RC Qualification	+	Yes	+	No	+	No	-	No
RC Meetings	+	Yes	-	Yes	-	No	+	No

Significance: Yes, if significant OLS at 10% or less
Association: based on significance and/or majority of 4 models' outcome

The table above seems to represent the findings of a study examining the relationship between Risk Committee (RC) characteristics and various forms of risk and performance. The study used Ordinary Least Squares (OLS) model, with results being deemed significant if they were at a 10% level or less. The "+" and "-" signs under "Association" likely represent positive or negative associations between the RC characteristics and the risk/performance element, respectively.

- RC Existence is associated with negative impact on both risk and performance of US commercial banks. The negative relationship is significant only for credit risk, but insignificant for regulatory risk, insolvency risk, ROE, and ROA. Credit risk is the most significant risk faced by commercial banks; thus, RC may deploy more resources or attention to managing credit risk which could explain why RC existence impacts credit risk only and does not seem to reduce regulatory risk nor insolvency risk.

- RC size is positively and significantly associated with credit risk, suggesting that banks with larger RCs may feel more confident in accepting higher credit risk. RC size seems to be insignificant for ROE, ROA, Regulatory and Insolvency risk.

- RC independence is not associated with any of the risk or performance measures. This indicates that RC independence could be the least important RC characteristics in this study.

- RC Qualification has a significant positive association with credit risk, indicating that banks with RCs that have more qualified members accept higher credit risk. This could be due to being confident in their ability to manage and accept higher risks. RC Qualification has no impact on bank's regulatory nor insolvency risks. The RC qualification seems to be irrelevant to bank's performance.

- The frequency of Risk Committee meetings seems to be significantly associated with both credit risk (positive association) and regulatory risk (negative association). This suggests that more frequent meetings may improve credit risk management but could increase regulatory risk. The association with insolvency risk and performance is not significant.

- None of the RC characteristics is significantly associated with bank's performance. This could provide strong foundation for the argument that RC work is more risk-management oriented.

- The lack of significance in the association among some RC attributes and risk factors (for example, RC independence and credit, regulatory, and insolvency risk; and RC Qualification and both regulatory and insolvency risks) could be due to the fact that the relationship is influenced by other factors, such as the effectiveness of risk management practices, corporate governance structures, or the regulatory environment, which are not captured by the models.

3.4 Findings and Results

The study investigates the relationship between key risk committee (RC) characteristics, like RC existence, RC size, RC independence, RC qualification, and RC number of meetings, and bank's risk taking and performance. The bank risk taking was measured by three risk variables, namely credit risk, regulatory risk, and insolvency risk. ROE and ROA are deployed to measure bank's performance. The relationships were examined using OLS regression. For robustness, the Fixed Effects, Generalized Method of Moments, and Generalised Least Square models are also deployed. I tested the period from 2016-2019 for a sample of (241) US commercial banks, resulting a (966) bank-year observations.

The existence of a Risk Committee (RC) appears to have a negative association with both the risk and performance of commercial banks in the United States. This inverse relationship is, however, only statistically significant in relation to credit risk, leaving the influence on regulatory risk, insolvency risk, return on equity (ROE), and return on assets (ROA) statistically insignificant. Given the vital significance of credit risk in the commercial banking sector, it is plausible that RCs may devote more resources or focus towards managing this particular risk type. This potential prioritization could account for the unique impact of RC existence on credit risk and the absence of such effects on regulatory and insolvency risk.

There is a positive and statistically significant association between RC size and credit risk. This suggests that banks with larger RCs might exhibit increased confidence in navigating higher credit risk scenarios. The size of the RC, however, does not appear to have a significant effect on ROE, ROA, regulatory risk, or insolvency risk.

The independence of the RC does not demonstrate any statistically significant association with the risk or performance measures in this study. This may suggest that, within the confines of this research, RC independence may be considered a lesser priority among the various RC characteristics.

The qualification level within an RC is positively and significantly correlated with credit risk. This might suggest that banks with highly qualified RC members are more confident in their capacity to effectively manage and thus accept higher levels of risk. The qualifications of the RC do not significantly influence the bank's regulatory or insolvency risks, and do not appear to bear relevance to the bank's performance.

The frequency of RC meetings exhibits a significant correlation with both credit risk (positive association) and regulatory risk (negative association). This pattern suggests that more frequent meetings might enhance the management of credit risk but could simultaneously amplify regulatory risk. The frequency of meetings does not show a significant association with insolvency risk or the bank's performance.

Chapter Four: Chief Risk Officer: Impact on Bank Risk and Performance

The Basel Committee on Banking Supervision (BCBS) (2015) and the Financial Stability Board (FSB) (2013) both underscore the pivotal role of a Chief Risk Officer (CRO) in maintaining effective risk management within banking institutions. Both regulatory bodies outline a set of responsibilities and qualifications for the CRO, aligning on the need for independent and effective risk management. The CRO's primary duty, according to BCBS, is to oversee the development and implementation of the bank's risk management function. The mandate extends to several key areas including strengthening staff skills, enhancing risk management policies, establishing risk appetite statements, and actively monitoring risk adherence. Furthermore, the CRO plays a role in strategic planning, new product development, capital and liquidity planning, and compensation design.

Both BCBS and FSB emphasize the requirement for the CRO to possess sufficient organizational stature, seniority, and skill set to manage the bank's risk profile. Independence is underscored, necessitating that the CRO's duties be separate from other executive functions. They must have direct access to all relevant information, free from "dual hatting," and have unimpeded access to the bank's board or risk committee. Regular and open dialogue is encouraged between the CRO, board, and risk committee. The CRO's appointment and dismissal, as well as their compensation and performance review, fall under the purview of the board or its risk committee. Transparency in these processes is important; the bank should discuss the reasons for a CRO's dismissal with its supervisor or regulator and provide public disclosure of the event.

FSB's recommendations reinforce those of BCBS, specifying that the CRO should be independent of business lines and meet regularly with the board and risk committee. Active involvement in risk-related decision-making processes, including strategic planning, stress testing, and funding and liquidity management planning, is advised. Moreover, the CRO should establish performance indicators for measuring risk management performance and meet at least quarterly with the bank's supervisor to discuss risk management scope and coverage.

This study will examine some key requirements or recommendations listed above, like CRO presence and CRO power or seniority. Further, the study will investigate additional CRO attributes, namely CRO qualification, CRO tenure, and CRO gender.

4.1 Literature Review and Research Hypothesis Development

I searched the Brunel Library online site, which includes most of the largest databases[14], in multiple fields including business, economics, and finance. I used the following selection criteria: (1) all fields: "Chief Risk Officer"; (2) And: All fields: "Bank" or "Banking"; (3) Content type: Journal Article; (4) Language: English; (5) Disciplines: All; and (6) Limit to: "Peer reviewed publications. The initial search yielded 78 articles. After carefully reading the abstract of these articles, I identified 29 articles where the Chief Risk Officer and/or at least one of its attributes was examined. Then, and to improve the reliability and quality of outcomes, articles from journals rated 1 or above in the "Academic Journal Guide (2018) by Chartered ABS" were selected, and that resulted in 22 qualified articles.

4.1.1 CRO attributes and Bank Risk and Performance

Literature about the CRO rule and attributes and how it impacts firms' performance and/or risk taking is limited (Lagasio, 2019). Existing research papers examined the relationship between firm outcome (performance and/or risk) and: (1) CRO reporting line and presence in executive board (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013); (2) CRO compensation, and centrality (Ellul and Yerramilli, 2013).

4.1.1.a CRO Presence and Bank Risk and Performance

To investigate the impact of CRO attributes on bank risk taking, Ellul and Yerramilli, (2013) created a Risk Management Index (RMI). It included four variables: CRO existence, CRO status (executive or non-executive), CRO Top 5 (weather CRO is among top 5 highest paid executives), and CRO centrality (CRO compensation relative to CEO's). The study used data from 74 US Banking Holding Companies for the period 1995 to 2010. Authors found that banks with higher RMI in 2006 had lower ratio for Non-performing Loans (NPLs) in the 2007-2008 crisis period. Pagach and Warr (2011) examined the characteristics of firms that hire a CRO. Using a sample of financial and non-financial firms for a period from 1992 to 2005, they found that financial firms that hire a CRO: (1) have less volatility in their cash flow and stock return; (2) have higher leverage; and (3) have lower market-to-book ratios. The study focused on the characteristics of the firms that hire a CRO at the point of hiring, thus, their results do not suggest any association between the CRO presence and the noted characteristics. Mat Rahim and Mahat, (2015) employed a risk governance mediating factor, that includes CRO presence,

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[14] Some of the databases included are Scopus, Web of Science, Social Sciences Citation Index, Ingenta Connect, Elsevier, Emerald Journals, ScienceDirect Journals, and Business Source Premier.

RC presence, and Shariah committee presence, in their study of the relationship between bank performance and corporate governance. Using a sample of 200 Islamic banks from various countries for the year 2013, the authors found a mediating effect of risk governance to bank's performance measured by ROA, ROE, and profit margin. However, the impact of the CRO presence only is not clear due to the research design and methodology. Pernell, Jung and Dobbin (2017) used a sample of 157 US banks from 1995 to 2010 to examine the relationship between CRO presence and bank's reliance on new derivatives. The authors concluded that CRO presence predicts holding of new derivatives. The study also highlighted that banks did not hire CROs to manage future or existing risks rather to meet regulatory requirements.

Dupire and Slagmulder (2019) studied a sample of 33 insurance companies and 54 banks from Europe for two years of observations 2007 and 2014. The authors found that financial institution with powerful owners (owning > 20%) are less likely to appoint a CRO. However, the study does not address the impact of CRO presence on the firms' risk and/or performance indicators. Aljughaiman and Salama (2019) investigated risk governance mechanisms in the Middle East and North Africa (MENA) region across both Conventional Banks (CBs) and Islamic Banks (IBs). The authors used a sample of 65 listed banks for the period from 2005 till 2015 to cover pre and post crisis period. They constructed an RGI that included mainly RC and CRO characteristics. The authors included the following CRO variables: (1) CRO presence; (2) CRO status (being an executive officer in the bank); (3) CRO membership within the RC; and (4) CRO reporting directly to the board of directors. The authors found no relation between CRO average and banks' risk taking, measured by an index representing banks' credit, market, liquidity, insolvency, and operational risks, in both CBs and IBs. However, the relationship between CRO presence and bank's risk taking is not identified due to the research methodology as an index of CRO variables were used.

Lee et al. (2020) found that CRO presence reduces risk-taking in 29 Malaysian banks Malaysian banks (15 conventional and 14 Islamic) during the period 2007 to 2016. The study used four risk-taking measures: credit, insolvency (invert of z-score), portfolio risk, and assets risk and found significantly negative association between CRO presence and all four risk variables. c used a sample of 1,480 observations for Asian banks from 2010 to 2017. They found a negative association between CRO presence and both liquidity risk and operational risk. However, CRO presence was not associated with credit and insolvency risk. The study found that CRO presence has a negative, but insignificant, association with bank's risk taking, measured by the ratio of risk-weighted assets to total assets. Qureshi and Lamarque (2022) examined the impact of CRO "risk control and supervision" component (includes CRO presence and executive committee membership) on the credit risk of Significantly Supervised European Banks (SSEB). The authors investigated the period 2013 to 2017. The study

measured credit risk using a proxy of impaired loans ratio of total loans. The authors found that CRO component significantly (at 5% level) negatively associated with SSEB's credit risk. However, the effect of CRO presence on credit risk was not identified due to the research design and methodology.

CRO presence could lead to: (1) Improved risk management: The presence of a CRO may lead to more effective identification, assessment, and mitigation of risks, resulting in a better financial performance. A CRO can help in developing robust risk management frameworks, policies, and procedures that enable banks to manage their risks more efficiently and maintain a healthy balance between risk and return. (2) Enhanced regulatory compliance: A CRO can help banks navigate the complex regulatory landscape and ensure compliance with relevant regulations. By avoiding regulatory penalties and maintaining a positive relationship with regulators, banks can focus on their core business activities and achieve higher profitability. (3) Better decision-making: A CRO can provide valuable insights and expertise in risk-related matters, which can inform the bank's strategic decision-making process. This can lead to better capital allocation and risk-adjusted investment decisions, ultimately improving the bank's financial performance. (4) Increased investor confidence: The presence of a CRO may signal to investors that the bank takes risk management seriously and has the necessary infrastructure in place to manage its risks effectively. This can lead to higher investor confidence, potentially resulting in an improved financial performance. Based on the above, the hypothesis for CRO Presence are:

> *H6: Chief Risk officer presence is negatively associated with Bank's Risks.*
> *H6a: Chief Risk Officer presence is positively associated with Bank's Performance.*

4.1.1.b CRO Power (Executive/seniority) and Bank Risk and Performance

Alessandra Mongiardino and Christian Plath, (2010) argued that adequate risk governance requires a dedicated board level risk committee, of which a majority should be independent, and that the CRO should be part of the bank's executive board. Based on a survey among 20 large banks, they find that only a small number of banks followed these guidelines in 2007

Aebi, Sabato and Schmid, (2012) examined the relationship between bank ROE, ROA, and buy-and-hold returns, and CRO power indicated by CRO presence in bank's executive board and/or CRO reporting line. Using data from 573 US banks during the financial crisis period (2007-2008), the study found that banks where CRO was a member of the executive board have reported higher ROE and ROA. Further, they are significantly more likely to have standalone RC, thus, a stronger risk management function. Also, the authors found that banks where the CRO reported to the CEO performed significantly worse than banks where CRO

reported directly to the board in the financial crisis. These findings are significant as they support the importance of empowered CRO.

To investigate the impact of CRO attributes on bank risk taking, Ellul and Yerramilli, (2013) created a Risk Management Index (RMI). It included four variables: CRO existence, CRO status (executive or non-executive), CRO Top 5 (weather CRO is among top 5 highest paid executives), and CRO centrality (CRO compensation relative to CEO's). The study used data from 74 US Banking Holding Companies for the period 1995 to 2010. Authors found that banks with higher RMI in 2006 had lower ratio for Non-performing Loans (NPLs) in the 2007-2008 crisis period. Amoozegar, Pukthuanthong and Walker, (2017) constructed a RMI (fairly like Ellul and Yerramilli's) that includes an CRO index to investigate the impact of CRO attributes on banks litigation risk (measured by the number of times a bank was subject to a class action lawsuit). The study used a sample of 432 observations for sued financial institutions for the period 1996 to 2011. The CRO index included: (1) CRO risk-related experience; (2) CRO number of years in position; (3) CRO status (executive or otherwise); (4) if CRO is among top five paid executives; (5) the percentage of CRO compensation to the CEO compensation; and (6) CRO reports directly to the board of directors. The study found that banks with higher RMI are less likely to be sued. However, and due to the research design and methodology, the impact of CRO power only is not identified.

Aljughaiman and Salama, (2019) investigated risk governance mechanisms in the Middle East and North Africa (MENA) region across both Conventional Banks (CBs) and Islamic Banks (IBs). The authors used a sample of 65 listed banks for the period from 2005 till 2015 to cover pre and post crisis period. They constructed an RGI that included mainly RC and CRO characteristics. The authors included the following CRO variables: (1) CRO presence; (2) CRO status (being an executive officer in the bank); (3) CRO membership within the RC; and (4) CRO reporting directly to the board of directors. The authors found no relation between CRO average and banks' risk taking, measured by an index representing banks' credit, market, liquidity, insolvency, and operational risks, in both CBs and IBs. However, the relationship between CRO power and bank's risk taking is not identified due to the research methodology as an index of CRO variables were used. Abid *et al.*, (2021) found a negative association between CRO independence and liquidity risk, credit risk, and operational risk. However, CRO independence was not associated with insolvency risk. Mashamba and Gani, (2022) examined risk governance and risk taking in African banks. The study used a sample of 41 listed banks in 12 African countries for the period 2011 to 2020. The study found that CRO board membership has a positive association with bank's risk taking, measured by the ratio of risk-weighted assets to total assets. Qureshi and Lamarque, (2022) examined the impact of CRO "risk control and supervision" component (includes CRO presence and executive committee membership) on the credit risk of Significantly Supervised European Banks

(SSEB). The authors investigated the period 2013 to 2017. The study measured credit risk using a proxy of impaired loans ratio of total loans. The authors found that CRO component significantly (at 5% level) negatively associated with SSEB's credit risk. However, the effect of CRO membership at executive committee on credit risk was not identified due to the research design and methodology.

A powerful CRO is more equipped to enforce better risk management policies and procedures leading to lower risks for banks. However, this might limit the banks' ability to generate higher returns. Therefore, the hypothesis for the relationship between CRO Power and banks' risk and performance are:

> *H7: Chief Risk Officer power is negatively associated with Bank's Risks.*
> *H7a: Chief Risk Officer power is negatively associated with Bank's Performance.*

4.1.1.c CRO qualification and Bank Risk and Performance

There is very limited literature on the impact of CRO qualification on bank risk and performance. A working paper by Balasubramanyan *et al.* (2019) finds that CRO presence had no major impact on risk performance or financial performance of banks in the US. The study argues that the lack of impact may partly be due to the fact that CROs are not adequately qualified to assess the risks involved, rendering their presence moot. While studies on CRO qualification could not be found in literature, I looked at the literature related to CEO qualification. CEO qualification has been associated positively with bank performance (Sakilu and Kibret, 2015). Similarly, (King, Srivastav and Williams, 2016) found that CEOs with relevant business qualifications (an MBA was considered for the study) outperformed their counterparts without business education. This extensive study considered 149 US banks for the period ranging from 1991 to 2011 and found that CEOs with better education significantly improve the financial performance of banks as they are better equipped to strategies and form appropriate policies. With regards to risk assessment, CEO qualification is positively associated with better risk management. While such banks may take on larger risks overall, the innovative risk management strategies espoused by more educated CEOs lead to more innovative and successful businesses (King, Srivastav and Williams, 2016). A similar argument is presented by (Farag and Mallin, 2018) who argue that more qualified CEOs are less risk averse, increasing the bank's credit risk, but while improving performance. A study on the Canadian insurance sector (Ozdemir, 2021), finds that when CROs are not qualified to assess risk are often employed by the industry, and therefore provide little advantage to the institution in terms of risk mitigation. Overall, literature points to the possibility of a more qualified CRO minimising the bank's risk and improving bank performance. Therefore, the

hypothesis for the relationship between CRO Qualification and banks' risk and performance are:

> *H8: Chief Risk Officer qualification is negatively associated with Bank's Risks.*
> *H8a: Chief Risk Officer qualification is positively associated with Bank's Performance.*

4.1.1.d CRO Tenure and Bank Risk and Performance

The literature covering the relationship between CRO tenure and banks' risk, and performance is rare. After thoroughly reviewing the existing literature I found only one study that indirectly covers this relationship. Amoozegar, Pukthuanthong and Walker (2017) constructed a RMI that includes an CRO index to investigate the impact of CRO attributes on banks litigation risk (measured by the number of times a bank was subject to a class action lawsuit). The study used a sample of 432 observations for sued financial institutions for the period 1996 to 2011. The CRO index included: (1) CRO risk-related experience; (2) CRO number of years in position; (3) CRO status (executive or otherwise); (4) if CRO is among top five paid executives; (5) the percentage of CRO compensation to the CEO compensation; and (6) CRO reports directly to the board of directors. The study found that banks with higher RMI are less likely to be sued. However, and due to the research design and methodology, the impact of CRO experience solely is not identified.

> *H9: Chief Risk Officer tenure is negatively associated with Bank's Risks.*
> *H9a: Chief Risk Officer tenure is positively associated with Bank's Performance.*

4.1.1.E CRO Gender and Bank Risk and Performance

While there is limited literature on CRO gender, a study by Lone, Mollah and Yin (2022) on female CROs in banks specifically find that they are less risk averse than their male counterparts. This study is on 120 US banks for 2004–2018 period. Interestingly, the study finds that while female CROs are less risk averse, the presence of females in the risk committee does mitigate this tendency if the CRO reports to the committee instead of the CEO. In agreement with the same, Fajembola *et al (*2018) examined Nigerian banks for the period between 2006 and 2016 and found that the presence of female members in a risk committee improved bank stability as female members are more averse to risk than their male counterparts. While the study does not explore CROs gender, it is in agreement with the findings of Lone, Mollah and Yin (2022).

A study by Hassan, Zulkafli and Ibrahim (2019) finds that female CROs also have a positive impact on financial performance of the banks. This extensive study incorporating over 100

listed banks from Asia find that banks with female CROs have better financial performance parameters. Though the parameters considered in this study are different, it is likely that the findings on performance is valid for this research as well. It is argued that female CROs bring a diverse perspective in an industry largely dominated by men and are better at strategizing and implementing corporate policy, thereby improving bank performance. The literature therefore agrees that gender diversity, especially the presence of female CROs improve both the financial performance and the risk performance of banks. Aligned with the above results, the hypothesis for the relationship between CRO Gender and bank's risk and performance are:

> *H10: Female Chief Risk Officers negatively associate with Bank's Risks.*
> *H10a: Female Chief Risk Officers positively associate with Bank's Performance.*

4.2 Design and Methodology

4.2.1 Sample and Data Sources

Firstly, the sample starts by obtaining all listed active companies under the industrial classifications "Banks" in Europe, United States, and Canada from S&P Capital IQ platform. Then, sample filtered by SIC code to include only commercial banks: National Commercial Banks (6021), State Commercial Banks (6022), and Commercial Banks Not Elsewhere Classified (6029). By focusing on commercial banks only, the study will have a homogenous sample with banks that face similar operation and objectives. The study focuses on the banks in the USA to eliminate country-related effects or variances. Also, the USA has one of the most advanced regulatory rules and regulations. Thus, I filtered the data by country to include banks in the USA only. The study focuses on the post-regulation change period from 2016 to 2019. I choose this period as it (1) allows for sufficient period for banks to implement the relevant regulations that was introduced in 2014; (2) this period received least attention in the current literature as most researchers focused on the financial crisis period; and (3) this period ends in 2019 as 2020-2022 years were affected by the Covid-19 pandemic where banks' operations were disrupted due to series of national lockdowns. This leaves a final sample of (241) banks and (966) bank-year observations. Banks consolidated financial variables are in US Dollar and collected from Bloomberg database. Risk Committee variables are hand-collected from banks' websites, annual reports, proxy statements, and 10-K statements*.*

Table 17: Sample by SIC code and Name.

SIC Code	SIC Name	Number of Banks	%
6021	National Commercial Banks	77	31.95%
6022	State Commercial Banks	161	66.80%
6029	Not Elsewhere Classified Commercial Banks	3	1.24%
Grand Total		241	100%

Table 18: CRO Presence over the sample years

Year	NO	YES
2016	47%	53%
2017	45%	55%
2018	44%	56%
2019	40%	60%
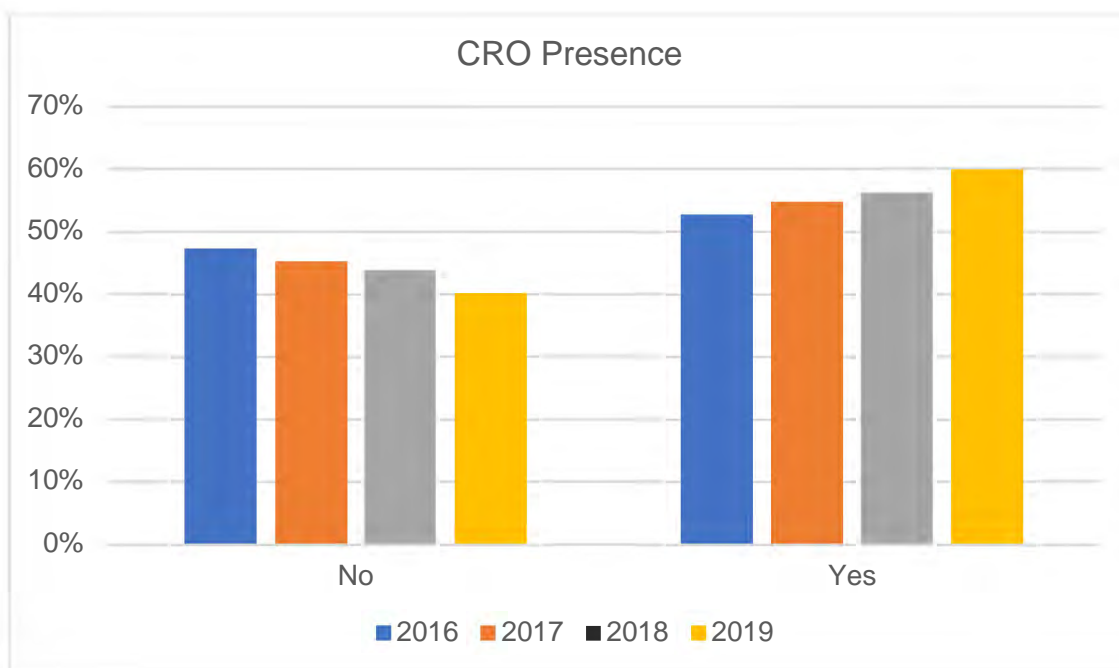
Figure 4: CRO presence in the banks' sample

4.2.2 Variables Definition and Description

Dependent Variables:

Credit Risk (CR)

While commercial banks (CBs) face operation, interest rate, financial, market, and liquidity risks, Credit Risk remains the most critical risk for CBs evident by regulators efforts to improve capital quality and credit risk management following the financial crisis. As reported by Basel Committee on Banking Supervision (BCBS), low quality credit risk management techniques remain the major cause of banking crises worldwide. Consistent with (Ellul and Yerramilli, 2013) and (Lu and Boateng, 2018), Non-Performing Loan (NPL) ratio will be deployed to

capture bank's credit risk. NPL is calculated as the amount of non-performing loans divided by total loans. Banks' NPL is collected from Bloomberg database (RX370).

Insolvency Risk (IR)

Insolvency risk captures the risk of bank's inability to meet its obligations/debt when they fall due (Lepetit and Strobel, 2015). The Z-score is used widely in the literature to measure insolvency risk and distance from default (Akbar et al., 2017; Mollah et al., 2017; Ramly and Nordin, 2018; Aljughaiman and Salama, 2019). Z-score has an inverse relationship with insolvency risk; thus, higher Z-score value indicates lower exposure to insolvency risk. Following (Aljughaiman and Salama, 2019) and (Mollah et al., 2017), I calculate the Z-score by scaling the total of average return on assets and the capital to total assets ratio to the standard deviation of return on assets; as:

Equation 4: Z-Score

$$Z - SCORE = \frac{\text{ROA} + CAR}{\sigma(ROA)}$$

Standard deviation of return on assets measures the variability in ROA which captures most of bank's interest rate risks, operating risks, and other earning-related risks (Ramly and Nordin, 2018), and that properly explains why the Z-score is a popular insolvency risk measure in the literature.

Regulatory Risk (RR) - Capital Adequacy

Regulators rely heavily on the use of Tier-1 Capital ratio as a measure of bank's capital adequacy and its overall risk of default. Basel 1 in 1988 introduced the first Tier-1 capital (core capital) requirement of a minimum of 4% of risk weighted assets. While Basel II (2007) did not change this minimum requirement, Basel III and Dodd and Frank Act (2010) introduced a new definition of capital: "common equity Tier-1" with a minimum requirement of 4.5%; and Tier-1 Capital ratio increased to 6%. While many researchers deployed the Tier-1 Capital ratio as a control variable ((Ellul and Yerramilli, 2013; Leone, Gallucci and Santulli, 2018; Aljughaiman and Salama, 2019), I, and Following (Iselin, 2020), deploy it as a dependent variable to capture the regulatory risk/impact of the CRO characteristics. I collect the Tier-1 Capital to risk weighted assets ratio from Bloomberg database (BS086).

Return On Equity (ROE)

Return on Equity (ROE) is widely used in the banking literature as a proxy to measure banks performance (Aebi, Sabato and Schmid, 2012; Battaglia and Gallo, 2015; Gontarek and Belghitar, 2018). The research employs ROE as an indicator of Bank's performance. I

measure ROE as net income available for common shareholders divided by the average book value of total common equity. ROE data are collected from Bloomberg database (RR029).

Return On Asset (ROA)

Return on Asset (ROA) is one of the mostly used profitability measures in the banking literature and as a to measure banks performance (Aebi, Sabato and Schmid, 2012; Battaglia and Gallo, 2015; Nahar, Jubb and Azim, 2016; Nahar and Jahan, 2021). ROA is employed in this research as an indicator of Bank's performance. I measure ROA as Net income before extraordinary items as a percentage of total assets. ROA data are collected from Bloomberg database (RR028).

Explanatory Variables:

Chief Risk Officer Existence (CROEX) is a dummy variable that will take a value of 1 if a bank has a chief risk officer in a specific year and zero otherwise (Aebi, Sabato and Schmid, 2012; Iselin, 2020). I determine if a bank has a CRO in a given year by searching the word "CRO" or "Chief Risk Officer" in the bank's annual report and/or proxy statement for that year and read through it to identify the existence of CRO position. Cases where the title includes other functions (like credit), in addition to risk (e.g., Chief Risk and Credit officer) where classified as non-standalone CRO and therefore assigned a zero. CRO Power (CROP) is a dummy variable that will take a value of 1 if the CRO is an executive officer in the bank (Aebi, Sabato and Schmid, 2012, Ellul and Yerramilli, 2013, Aljughaiman and Salama, 2019). CRO Qualification (CROQUAL) is a dummy variable that will take the value of 1 if the CRO has an academic (finance or accounting bachelor, master, or PhD degree) and/or professional qualification (CPA, CFA, CMA, CIMA, or ACCA) and zero otherwise. I first read through the bank's annual report to identify if CROQUAL is met; if not, I search LinkedIn profile of CRO to determine if CROQUAL condition is satisfied. CRO Experience/Tenure (CROTEN) is the total number of years of being in the role of CRO in the same bank (Amoozegar, Pukthuanthong and Walker, 2017). In most cases I identified the CRO starting year (from the bank's annual report or the CRO's LinkedIn profile) and calculated the CROTEN as the year of study minus the starting year. CRO Gender (CROGEN) is a dummy variable that will take the value of 1 if the CRO is a male and zero otherwise. The CRO gender was identified by looking at bank's websites and/or annual reports, and in some cases by screening CRO's LinkedIn profile.

Control Variables:

I control for key corporate governance variables. Board Size (BODS), measured by the number of directors serving in the board. BODS is collected from Bloomberg database (CG600) (Aljughaiman and Salama, 2019). Board Independency (BODIN), the percentage of independent members of the board (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli,

2013; Minton, Bernadette A; Taillard, Jerome; Williamson, 2014; Aljughaiman and Salama, 2019; Iselin, 2020). BODIN is collected from Bloomberg database (ES063).

The research also controls for bank-level variables. Bank Size (BSIZE), measured by the logarithm of bank's total assets (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Aljughaiman and Salama, 2019). BSIZE is collected from Bloomberg database (BS035). Bank Age (BAGE), measured by number of years since the bank was established (Akbar et al., 2017; Aljughaiman and Salama, 2019; Bhuiyan, Cheema and Man, 2020). BAGE is collected from Bloomberg database. Following previous research (Ellul and Yerramilli, 2013; Hines and Peters, 2015; Aljughaiman and Salama, 2019), I control for Bank Leverage (BLEV), calculated as the ratio of total debt to total equity. BLEV is collected from Bloomberg database (RR732). Loans to Assets (LOAS), measured by total loans value scaled by total assets is used as a control variable reflect bank's risk appetite and loan credit quality (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Gontarek and Belghitar, 2018; Aljughaiman and Salama, 2019). LOAS is collected from Bloomberg database (RR170). Additionally, and in the Risk model only, the study will control for the profitability measure Return on Assets (ROA) calculated as the return on assets scaled by total assets (Ellul and Yerramilli, 2013; Aljughaiman and Salama, 2019). Table 3 summarises all variables definitions and their data source.

4.2.3 Estimation Models

The study conducts three main tasks/tests: (1) descriptive statistics to present the nature, characteristics, and distribution of data; (2) correlation, to present evidence about the relation/association between the key variables; and (3) GLS random-effects estimator, to show the impact of CRO characteristics on Banks' risk taking and performance. GLS random-effects estimator has been used in previous studies on bank risk/performance and governance (add references). I choose the random-effects model over the fixed-effect model as the latter requires variables time variation and cross-bank variations which is not applicable to most of the risk governance variables. Also, the fixed-effects model is not suitable for this research which includes many dummy variables since the fixed-effects model eliminates the impact of dummy variables (add references). I perform subsample analysis based on bank's size to investigate the association between bank risk/performance and risk committee characteristics (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013; Aljughaiman and Salama, 2019; Nahar and Jahan, 2021).

The hypothesis H6 to H10 will be tested using the following model:

$$RISKijt = \alpha_0 + \beta1CROEXit + \beta2CROPit + \beta3CROQUALit + \beta4CROTENit + \beta5CROGENit + \beta6CONTROLSit + \varepsilon it$$

The hypothesis H6a to H10a will be tested using the following model:

Equation 6: Equation for Performance:

$$PERFORMANCEijt = \alpha_0 + \beta1CROEXit + \beta2CROPit + \beta3CROQUALit + \beta4CROTENit + \beta5CROGENit + \beta6CONTROLSit + \varepsilon it$$

Where $RISK_{ijt}$ is the proxy of either credit risk (CR), insolvency risk (IR) or regulatory risk (RR) for bank i at time t; $PERFORMANCE_{ijt}$ is the proxy of either Return on Equity (ROE) or Return on Assets (ROA) which measures the performance of bank i at time t; $CROEX_{it}$ is the dummy variable for CRO existence for bank i at time t; $CROP_{it}$ is the CRO power (executive or not) for bank i at time t; $CROQUAL_{it}$ is the CRO qualification for bank i at time t; $CROTEN_{it}$ is the CRO tenure for bank i at time t; $CROGEN_{it}$ is the CRO gender for bank i at time t; and $CONTROLS_{it}$ are vector of bank level and corporate governance variables for bank i at time t.

Table 19: Variables' definitions, and sources.

Variable	Measurement / Definition	Data Source
NPL Ratio (CR)	Non-performing loan ratio, measured by: Total non-performing loans as a percentage of total loans.	Bloomberg database (RX370)
Z-score (IR)	Bank distance to default is computed as sum of the return on assets and capital ratio, divided by the standard deviation of the return on assets. Z-score = (ROA + CAR) / σ (ROA)	Bloomberg database
Tier-1 Capital Ratio (RR)	Total Tier-1 Capital as a percentage of risk-weighted total assets.	Bloomberg database (BS086)
Return on Equity	ROE, measured as net income available to common shareholders as a percentage of total common equity	Bloomberg database (RR029)
Return on Assets	Net income before extraordinary items as a percentage of total assets.	Bloomberg database (RR028)
CRO Existence	A dummy variable that takes the value 1 if Bank has a designated CRO, 0 otherwise.	Annual Reports/Proxy Statements
CRO Power	A dummy variable that takes the value 1 if CRO is an executive officer, 0 otherwise.	Annual Reports/Proxy Statements
CRO Qualification	A dummy variable that takes the value 1 if the CRO has an academic (finance or accounting bachelor, master, or PhD degree) and/or professional qualification (CPA, CFA, CMA, CIMA, or ACCA), 0 otherwise	Annual Reports/Proxy Statements
CRO Tenure	Total number of years of being in the role of CRO in the same bank	Annual Reports/LinkedIn
CRO Gender	A dummy variable that takes the value 1 if CRO is male, 0 otherwise.	Annual Reports/Proxy Statements
Board Size	Number of members in the Board	Bloomberg database (CG600)
Board Independence	Percentage of independent members of the total number of members in the Board	Bloomberg database (ES063)
Loan to Assets	Total loans as a percentage of total assets.	Bloomberg database (RR170)
Bank Size	Natural logarithm of the book value of total assets.	Bloomberg database (BS035)
Bank Leverage	Leverage ratio measured by total debt to equity.	Bloomberg database (RR732)
Bank Age	The difference between the sample year and the year in which the bank was incorporated.	Bloomberg database

4.3 Data Analysis

4.3.1 Univariate Analysis.

The summary statistics for the dependent variables, risk committee characteristics, and control variables are provided in Table 16. The sample is segmented into large banks and small banks; based on total assets size. I used $10 billion as a cut-off point (consistent with regulatory directions), thus, banks with total assets greater than or equal to $10 billion are classified as large, otherwise small banks.

The results suggest that large banks have significantly lower credit risk than smaller banks. The average mean value for NPL is 0.536% and 0.589% for large and small banks respectively. Contradictory, smaller banks have significantly higher Tier-1 capital ratio than larger banks, the mean value for Tier-1 capital ratio for smaller banks is 13.137% compared to 11.985% for larger banks. The sample shows that both sup-sample groups to maintain sufficient Tier-1 capital ratio that is almost double the regulatory requirement of 6%. Z-Score has an inverse relationship with solvency risk. The difference between mean values for Z-score for small and large banks is insignificant. The mean values for this insolvency measure are 0.309 and 0.303 for large and small banks respectively. Large banks reported slightly better performance, with an average ROE of 10% compared to a mean value for ROE of 9.6% for small banks; and an average ROA of 1.2% and 1% for large and small banks respectively.
.
The mean value of CRO Existence (CROEX) for the entire sample is 56% for the time frame considered. There is a significant difference between the mean value of CROEX for large banks (79%) and small banks (48%). This is expected as large banks (total assets > $10 Billion) are more likely to consider having a chief risk officer given the larger quantum of decisions to be made and risks to be mitigated. However, it should be noted that overall, only less than 60% of the banks have appointed a CRO.

Both large and small banks have a relatively large board of directors. Mean value of board size (BODS) is 11.65 for the full sample, 12.84 for large banks, and 11.33 for small banks. The results suggest that banks tend to have independent boards. The mean value of board independency (BODIN) is 82%, with no significant difference between the mean value for large banks (83%) and the mean value for small banks (81%). The sample represent a very well-established banks with the average bank age (BAGE) 29 years for the full sample. Larger banks have slightly higher mean BAGE of 35 years compared with a BAGE mean value of 28 years for smaller banks. The mean value for debt-to-equity ratio, the measure of bank's

leverage (BLEV), is 74.5% for the full sample. Larger banks are more leveraged with a mean value of 84.5% compared to a mean value of 71.6% for small banks. The results show that smaller banks have higher risk appetite. The mean value for loans to assets ratio (LOAS), a measure of risk appetite, for small banks is 71% compared to a LOAS mean value of 66% for large banks. Banks' profitability, measured by ROA, is not significantly different between large and small banks.

The study emphasizes the attributes of Chief Risk Officers (CROs) in banking institutions, where there is a distinct CRO role, to avoid any bias that might emerge from considering banks that do not employ a CRO. Tabulated data pertaining to CRO attributes for both smaller and larger banks with a dedicated CRO is provided in Table 17. The mean for CRO qualification (CROQUL) shows a substantial variation between larger banks (54%) and their smaller counterparts (46%). Such a difference may be indicative of the abundant resources at the disposal of larger banks, which afford them the capability to recruit CROs with superior qualifications. Furthermore, larger banks could potentially necessitate more expertise in their CROs compared to smaller banks. However, the mean tenure of CROs presents an interesting difference, with those serving in larger banks tending to have slightly shorter tenures, averaging 4.46 years, compared to the average of 5.05 years observed for CROs at smaller banks. In the gender-related variable (CROGEN), negligible discrepancy is evident. Both larger and smaller banks exhibit a near-identical mean of 0.68 and 0.7 respectively, which implies that the overwhelming majority of CROs across bank sizes are male. The variable pertaining to the possession of executive powers by the CRO (CROSEN) demonstrates a minor difference between smaller and larger banks. While the mean value for smaller banks stands at 0.76, it is slightly lower at 0.72 for larger banks. Even though the divergence is modest, it is worth noting that proportionally fewer CROs at larger banks possess executive rights in comparison to smaller banks.

Table 20 presents a univariate comparison of several key variables between banks with and without a Chief Risk Officer (CRO) present. These variables include the ratio of non-performing loans to total loans (NPLTL), return on equity (ROE), the Tier-1 capital ratio, and the Z-Score. The NPLTL ratio shows a slight increase in banks with a CRO (0.5868) compared to those without a CRO (0.5582), however, the p-value of 0.3300 indicates that this difference is not statistically significant. The Return on Equity (ROE) is slightly lower in banks with a CRO (9.5094) as opposed to those without (9.9960). The p-value of 0.0390 suggests that this difference is statistically significant at the 5% level. Regarding the Tier-1 capital ratio, banks without a CRO possess a higher mean value (13.3264) compared to those with a CRO (12.4250). The p-value of 0.0000 indicates that this discrepancy is highly statistically

significant. Lastly, the Z-Score, which measures the risk of insolvency, is marginally higher in banks without a CRO (0.3148) than in those with a CRO (0.2966). However, the p-value of 0.4360 implies that this difference lacks statistical significance.

Table 20: Descriptive Statistics

Variables	N	Mean	Min	Max	Std. Deviation	Skewness Statistic	Std. Error	Kurtosis Statistic	Std. Error	Large Banks: Sample Mean	Small Banks: Sample Mean	p Value
Dependent Variables												
CR	938.000	0.574	0.000	3.270	0.439	1.672	0.080	4.238	0.160	0.536	0.589	0.046
IR	913.000	0.305	-0.066	3.721	0.349	3.536	0.081	20.870	0.162	0.309	0.303	0.777
RR	938.000	12.815	6.000	25.420	2.370	1.511	0.080	4.016	0.160	11.985	13.137	0.000
ROE	942.000	9.720	-31.179	30.464	3.702	-2.522	0.080	30.477	0.159	9.995	9.614	0.117
ROA	942.000	1.063	-3.145	4.453	0.409	-1.185	0.080	20.474	0.159	1.184	1.017	0.000
CRO Variables												
CROEX	966.000	0.56	0	1	0.497	-0.238	0.079	-1.947	0.157	0.79	0.48	0.000
CROSEN	962.000	0.41	0	1	0.493	0.351	0.079	-1.881	0.158	0.57	0.36	0.002
CROQUAL	962.000	0.27	0	1	0.446	1.013	0.079	-0.977	0.158	0.43	0.22	0.000
CROTEN	958.000	2.68	0	36	4.503	2.8	0.079	11.803	0.158	3.54	2.40	0.069
CROGEN	962.000	0.38	0	1	0.487	0.475	0.079	-1.778	0.158	0.54	0.33	0.000
Control Variables												
BODS	966.000	11.651	4.000	33.000	3.058	1.606	0.079	8.652	0.157	12.935	11.213	0.000
BODIN	910.000	81.90	33.333	94.118	10.072	-1.267	0.081	2.241	0.162	82.439	81.606	0.309
LOAS	946.000	70.161	20.049	89.095	10.314	-1.164	0.080	2.061	0.159	67.003	71.370	0.000
LOG_TA	946.000	22.340	19.721	28.623	1.561	1.145	0.080	2.025	0.159	24.412	21.532	0.000
BLEV (D/E)	946.000	74.578	0.000	439.732	53.734	1.247	0.080	3.109	0.159	78.439	73.099	0.141
BAGE	966.000	29.401	0.000	133.000	16.483	2.108	0.079	9.174	0.157	33.863	27.712	0.000

Table 21: Mean values of CRO characteristics for banks with CRO

Risk Committee Variables	Large Banks: Sample Mean	Small Banks: Sample Mean	p Value
CROSEN	0.720	0.760	0.317
CROQUL	0.540	0.460	0.066
CROTEN	4.460	5.050	0.191
CROGEN	0.680	0.700	0.758

Table 22: Mean values for banks with CRO based on CRO characteristics.

Variable	CROSEN		CROQUAL		CROTEN		CROGEN	
	Yes	No	Yes	No	>3YRS	<3YRS	Male	Female
CR	0.614**	0.513	0.595	0.582	0.583	0.585	0.611*	0.538
IR	0.296	0.291	0.290	0.299	0.280	0.319	0.281	0.324
RR	12.245***	12.965	12.314	12.543	12.587**	12.129	12.272**	12.778
ROE	9.449	9.593	9.407	9.562	9.761*	9.107	9.294**	9.911

* Significant at 1%

** Significant at 5%

*** significant at 10%

Table 23: Pearson pairwise correlation matrix for CRO characteristics and independent variables: Banks with CRO

Variable	1	2	3	4	5	6	7	8
CR	1.000							
IR	-0.047	1.000						
RR	0.052	0.023	1.000					
ROE	-.234**	.134**	0.012	1.000				
CROSEN	.103*	0.005	-.147**	-0.015	1.000			
CROQUL	0.015	-0.012	-0.054	-0.019	.119**	1.000		
CROTEN	-0.075	-0.005	.157**	.094*	.234**	0.003	1.000	
CROGEN	0.079	-0.057	-.109*	-0.070	.169**	.087*	0.062	1.000

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

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

Table 24: Univariate comparison of risk committee presence

	CRO Presence		
Variable	Yes	No	P Value
NPLTL	0.5868	0.5582	0.3300
ROE	9.5094	9.9960	0.0390
Tier-1 Capital Ratio	12.4250	13.3264	0.0000
Z-Score	0.2966	0.3148	0.4360

Table 25: Pearson pairwise correlation matrix: full sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CR	1.000															
IR	-.066*	1.000														
RR	.100**	0.042	1.000													
ROE	-.210**	.165**	-0.002	1.000												
CROEX	0.032	-0.026	-.189**	-.065*	1.000											
CROSEN	.075*	-0.019	-.206**	-0.060	.749**	1.000										
CROQUL	0.028	-0.023	-.133**	-0.051	.548**	.477**	1.000									
CROTEN	-0.031	-0.018	-0.012	0.031	.533**	.530**	.296**	1.000								
CROGEN	.064*	-0.050	-.184**	-.089**	.705**	.607**	.438**	.413**	1.000							
BODS	-0.032	0.025	-.149**	-0.024	.205**	.172**	.135**	.083**	.183**	1.000						
BODIN	0.001	0.026	-.069*	-0.007	.071*	0.006	.075*	0.009	0.062	0.001	1.000					
LOTA	-.069*	-0.037	-.418**	.085**	0.027	.079*	0.027	-0.006	.087**	-0.038	-0.001	1.000				
ROA	-.182**	.171**	.144**	.851**	-0.029	-0.008	-0.025	.077*	-0.019	0.052	-0.059	0.042	1.000			
Log TA	-.119**	.070*	-.246**	.122**	.330**	.231**	.216**	.144**	.223**	.317**	.107**	-.216**	.214**	1.000		
DE	0.008	0.051	-.223**	-0.043	0.054	0.049	0.035	-0.016	.082*	0.020	.103**	0.007	-.225**	.229**	1.000	
BAGE	-0.043	0.047	0.048	.068*	.144**	.128**	.149**	.078*	0.026	.065*	.145**	-.254**	.069*	.250**	.082*	1.000

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

4.3.2 Multivariate Analysis

This study employs four regression models (Ordinary Least Square (OLS), Fixed Effect, Generalized Method of Moments (GMM), and Generalised Least Square (GLS) regression models) to investigate the relationship between CRO characteristics (independent variables) and five dependent variables. In line with the methodology proposed by Roberts and Whited (2012), a Hausman test was carried out to determine the suitability of Random Effects (RE) versus Fixed Effects (FE), under the null hypothesis that unique errors are related to the predictors. The results of this test were statistically significant, leading to the adoption of Fixed Effects for this analysis. The dependent variables are credit risk (as measured by NPLTL), insolvency risk (as measured by Z-score), regulatory risk (as measured by Tier-1 Capital ratio), and bank performance (as measured by return on equity (ROE) and return on assets (ROA)). The statistical significance of various variables with respect to the dependent variable is indicated by the p-values. The regression coefficients as well as the standard errors are also provided for each of the regression models (tables 26-30)[15]. A negative value of the regression coefficient indicates an inverse relationship between the dependent variable and independent variable while a positive value indicates a direct relationship. The analysis is provided below as per each independent variable (CRO characteristic): CRO Presence, CRO Power, CRO Qualification, CRO Tenure, and CRO Gender.

CRO Presence

The results show that the relationship between Non-Performing Loans to Total Loans (NPLTL, a proxy for Credit Risk) and the existence of a Chief Risk Officer (CRO) is not significant. The findings are not aligned with the Agency theory, and do not support the hypothesis H6. The outcome, however, is consistent with the findings of Balasubramanyan *et al.* (2019), Abid *et al.*, (2021) and Qureshi and Lamarque (2022).

The relationship between the presence of a CRO in a bank and insolvency risk, measured by the Z-Score is not significant. The findings do not support the hypothesis (H6). However, the results are aligned with the findings of Balasubramanyan *et al.* (2019) and Abid *et al.*, (2021). Lack of statistical significance could indicate that the relationship between CRO existence and the Z-Score is not robust. Given the insignificant results, it is important to exercise caution when interpreting the relationship between CRO presence and the Z-Score.

The results indicate that there is no association between CRO Existence and regulatory risk, measured by Tier 1. This result does not support the hypothesis (H6) and consistent with the

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[15] Full tables for all models are provided in the appendices.

findings of Balasubramanyan *et al.* (2019). The lack of statistical significance indicates that there is insufficient evidence to conclude that the existence of a CRO has a significant impact on a bank's Tier 1 Capital ratio. Possible reasons for the insignificant relationship could be that the existence of a CRO alone does not ensure effective risk management or that other factors, such as the CRO's expertise, the bank's overall risk management strategy, or the regulatory environment, may have a more significant impact on the bank's Tier 1 Capital ratio. It is also possible that the relationship between CRO existence and Tier 1 Capital is non-linear.

The results reveal a negative association between CRO Presence and bank performance. The relationship is statistically significant at 1% and 5% level in the ROA and ROE respectively. The results do not support the hypothesis (H6a) and suggest that the presence of a CRO may limit managers from accepting higher risk activity which could lead to a lower bank performance.

The results could indicate that banks might not reduce their risks or improve their performance by just appointing a CRO. It could be possible that the CRO needs to have some certain characteristics to positively contribute to bank's favourable outcomes.

CRO Power

The relationship between Non-Performing Loans to Total Loans (NPLTL, a proxy for Credit Risk) and CRO Power shows a positive association. The relationship is significant at 1% in both OLS and GLS models, indicating a possible robust relationship. The findings suggest that a bank with a more senior/empowered CRO might be associated with higher credit risk. This does not support the hypothesis (H7). However, the results are consistent with the findings of Mashamba and Gani, (2022). This positive association could be due to various reasons such as the seniority of the CRO reflecting the bank's risk profile, or banks with higher credit risk appointing more senior CROs to manage their risk exposure.

The results indicate that there is a positive relationship between CRO Power and regulatory risk. The relationship is significant at 1% level in both OLS and GLS models. This does not support the hypothesis (H7). The results are aligned with the findings of Mashamba and Gani, (2022).

The results found no association between CRO power and insolvency risk. This does not support the hypothesis H7. However, the results are consistent with the conclusions of Aljughaiman and Salama, (2019). The lack of a statistically significant relationship could be explained as it is possible that CRO Power, as a standalone characteristic, may not be a strong determinant of insolvency risk. The effectiveness of a CRO in managing risk could be driven

by a combination of factors, such as qualifications, experience, and the overall risk management infrastructure within the bank. As a result, the seniority of a CRO alone may not have a substantial impact on the Z-Score or insolvency risk.

The relationship between CRO Power and a bank's performance is insignificant in both ROE and ROA models. This result does not support the hypothesis (H7a).

CRO Qualification

Interestingly, the findings suggest that CRO qualification is the least important attributes among the other CRO characteristics. CRO qualification is not significant in any of the five independent variables. This tends to suggest that CRO qualification does not affect bank's risk or performance. The results do not support the hypothesis (H8). The literature does not provide any studies related to the relationship between CRO qualifications and bank's risk, and performance.

CRO Tenure

There is a negative relationship between CRO tenure and credit risk. The relationship is statistically significant at 5% level in both OLS and GLS models, reflecting a possible robust association. This indicates that an increase in CRO tenure is associated with a decrease in credit risk, suggesting that more experienced CROs may be better at managing credit risk, leading to lower levels of non-performing loans. The findings are aligned with the Agency theory and resource dependence theory, and support the hypothesis (H9), and to the best knowledge of the author, this will be the first study to provide statistically significant results evidencing that CRO time in the same position could lead to reduced credit risk in commercial banks.

The findings show that CRO tenure is associated with higher Tier-1 Capital ratio, reflecting a lower regulatory risk. The relationship is statistically significant in the OLS and GLS models at 1% level. This outcome could indicate that longer-tenured CROs are more effective at managing regulatory risk, possibly due to their experience and better understanding of the bank's risk profile and regulatory environment. The findings support the hypothesis (H9) and to the best of the author's knowledge, this will be the first study to show significant results examining the relationship between CRO Tenure and bank's regulatory risk.

The relationship between CRO tenure and the Z-Score is insignificant, indicating that CRO tenure may not impact bank's insolvency risk. This result does not support the hypothesis (H9).

The results regarding the relationship between CRO Tenure and a bank's return on equity (ROE) and return on assets (ROA) show a positive association between CRO tenure and the two performance measures. This relationship is statistically significant in the OLS, Fixed Effects, and GLS models at 1% level. The results support the hypothesis (H9a). To the best author's knowledge, this is the first study to find a positive significant association between CRO tenure and bank's performance.

CRO Gender

The relationship between Non-Performing Loans to Total Loans (NPLTL, a proxy for Credit Risk) and CRO Gender is insignificant. This might indicate the CRO gender is irrelevant to bank's credit risk. The results do not support the hypothesis (H10). The literature does not provide any conclusions regarding the relationship between CRO gender and bank's credit risk.

The relationship between CRO gender and the Z-Score is negative and statistically significant in the OLS model at 10% level, and in the GMM model at 1% level. These results suggest that banks with male CROs tend to have a lower Z-Score, indicating higher insolvency risk, compared to banks with female CROs. Meaning that banks with female CROs are likely to have higher Z-score, indicating lower insolvency risk. The results support the hypothesis (H10) and consistent with the findings of Lone, Mollah and Yin (2022) who found that female CROs are more risk averse than their male counterpart.

The data shows that CRO Gender does not impact bank's regulatory risk as the coefficient of the Tier-1 Capital ratio is statistically insignificant. The findings do not support the hypothesis (H10). The literature does not include any evidence regarding the relationship between CRO gender and bank's credit risk.

CRO Gender may have no impact on bank's performance since the lack of significance provided by the ROE and RAO models. The results do not support the hypothesis (H10a). The outcome is not consistent with the findings of Hassan, Zulkafli and Ibrahim (2019) who concluded that female CROs have a positive impact on financial performance of banks.

Table 26: Regression results for the relationship between NPLTL and CRO characteristics

VARIABLES	OLS NPLTL	Fixed NPLTL	GMM NPLTL	GLS NPLTL
CRO Presence	-0.0231	0.0252	0.473***	-0.0251
	(0.0530)	(0.120)	(0.169)	(0.0527)
CRO Power	0.135***	-0.0130	-0.231	0.138***
	(0.0457)	(0.113)	(0.174)	(0.0454)
CRO Qualification	0.00698	-0.105	-0.209**	0.00622
	(0.0373)	(0.0729)	(0.0997)	(0.0371)
CRO Tenure	-0.00728**	-0.0140	-0.0116	-0.00774**
	(0.00368)	(0.00917)	(0.0123)	(0.00366)
CRO Gender	0.0495	0.0452	-0.0506	0.0517
	(0.0411)	(0.0767)	(0.109)	(0.0409)
Log_TA	-0.0276**	-0.0835	-0.162	-0.0286***
	(0.0110)	(0.0796)	(0.121)	(0.0109)
DE	-3.99e-05	-0.00153***	-0.00150**	4.08e-06
	(0.000278)	(0.000377)	(0.000633)	(0.000276)
ROA	-0.155***	-0.124***	0.0157	-0.165***
	(0.0390)	(0.0308)	(0.0462)	(0.0367)
Board_Size	-0.00277	0.00385	0.00609	-0.00262
	(0.00485)	(0.0106)	(0.0147)	(0.00483)
IND	0.000775	-0.00300	-0.00119	0.000673
	(0.00140)	(0.00267)	(0.00437)	(0.00139)
Bank_Age	-0.00169*	-0.0216*	-0.0124	-0.00180*
	(0.000939)	(0.0125)	(0.0171)	(0.000933)
Total_LoansTotalAssets	-0.00376***	-0.00928**	-0.0120**	-0.00409***
	(0.00145)	(0.00365)	(0.00547)	(0.00144)
Constant	1.657***	4.219**	5.312**	1.656***
	(0.277)	(1.642)	(2.544)	(0.276)
Observations	890	890	670	890
R-squared	0.080	0.120		
Number of group_id		230	230	230

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 27: Regression results for the relationship between Tier-1 Capital ratio and CRO characteristics

VARIABLES	OLS Tier_1	Fixed Tier_1	GMM Tier_1	GLS Tier_1
CRO Presence	0.229	0.284	0.490	0.216
	(0.236)	(0.496)	(0.791)	(0.234)
CRO Power	-0.734***	-0.334	-0.546	-0.732***
	(0.203)	(0.470)	(0.758)	(0.202)
CRO Qualification	-0.0955	0.240	-0.464	-0.0979
	(0.166)	(0.302)	(0.441)	(0.165)
CRO Tenure	0.0475***	0.0315	0.00631	0.0475***
	(0.0164)	(0.0381)	(0.0562)	(0.0162)
CRO Gender	-0.00371	-0.448	-0.0475	0.00313
	(0.183)	(0.318)	(0.483)	(0.181)
Log_TA	-0.500***	-1.756***	-1.742***	-0.497***
	(0.0490)	(0.330)	(0.297)	(0.0485)
DE	-0.00304**	-0.00692***	-0.00767***	-0.00306**
	(0.00124)	(0.00157)	(0.00276)	(0.00122)
ROA	1.220***	0.609***	0.855***	1.161***
	(0.174)	(0.128)	(0.220)	(0.163)
Board_Size	-0.0364*	0.0301	0.0792	-0.0367*
	(0.0216)	(0.0440)	(0.0640)	(0.0214)
IND	-0.000680	0.00567	0.00120	-0.000859
	(0.00624)	(0.0111)	(0.0189)	(0.00619)
Bank_Age	-0.00180	0.144***	0.0624	-0.00189
	(0.00418)	(0.0519)	(0.0638)	(0.00414)

	OLS	Fixed	GMM	GLS
Total_LoansTotalAssets	-0.111***	-0.122***	-0.107***	-0.111***
	(0.00647)	(0.0152)	(0.0240)	(0.00639)
Constant	31.30***	55.47***	51.50***	31.31***
	(1.234)	(6.817)	(6.905)	(1.224)
Observations	888	888	668	888
R-squared	0.367	0.160		
Number of group_id		228	228	228

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Table 28: Regression results for the relationship between Z-score and CRO characteristics

	OLS	Fixed	GMM	GLS
VARIABLES	Z-score	Z-score	Z-score	Z-score
CRO Presence	0.00423	0.139	0.186	0.00154
	(0.0423)	(0.170)	(0.244)	(0.0441)
CRO Power	0.0273	0.0877	0.166	0.0308
	(0.0364)	(0.160)	(0.237)	(0.0379)
CRO Qualification	-0.00220	-0.0701	0.00945	-0.00329
	(0.0296)	(0.103)	(0.137)	(0.0309)
CRO Tenure	-0.00112	0.00236	0.0453**	-0.00156
	(0.00294)	(0.0136)	(0.0183)	(0.00306)
CRO Gender	-0.0576*	-0.156	-0.393***	-0.0521
	(0.0327)	(0.110)	(0.148)	(0.0340)
Log_TA	-0.00404	-0.205*	-0.0371	-0.00338
	(0.00874)	(0.115)	(0.164)	(0.00909)
DE	0.000568**	-0.000120	-0.000783	0.000528**
	(0.000227)	(0.000548)	(0.000851)	(0.000236)
ROA	0.196***	0.0572	-0.0225	0.166***
	(0.0310)	(0.0438)	(0.0639)	(0.0305)
Board_Size	0.00134	0.000724	0.0133	0.00123
	(0.00383)	(0.0152)	(0.0199)	(0.00399)
IND	0.00112	0.00435	0.00603	0.00109
	(0.00112)	(0.00380)	(0.00570)	(0.00117)
Bank_Age	0.000384	0.0160	0.0336***	0.000251
	(0.000761)	(0.0181)	(0.0130)	(0.000791)
Total_LoansTotalAssets	-0.000555	-0.00676	-0.00271	-0.00107
	(0.00117)	(0.00521)	(0.00744)	(0.00121)
Constant	0.174	4.444*	-0.433	0.138
	(0.220)	(2.371)	(3.521)	(0.229)
Observations	873	873	653	873
R-squared	0.135	0.018		
Number of group_id		225	225	225

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Table 29: Regression results for the relationship between ROE and CRO characteristics

	OLS	Fixed	GMM	GLS
VARIABLES	ROE	ROE	ROE	ROE
CRO Presence	-0.826*	-0.862*	0.169	-0.826*
	(0.463)	(0.445)	(0.490)	(0.460)
CRO Power	-0.499	-0.447	0.177	-0.499
	(0.402)	(0.387)	(0.431)	(0.400)
CRO Qualification	-0.147	-0.160	-0.314	-0.147
	(0.328)	(0.315)	(0.346)	(0.326)
CRO Tenure	0.0980***	0.0825***	-0.0180	0.0980***

	(0.0321)	(0.0310)	(0.0336)	(0.0319)
CRO Gender	-0.488	-0.403	-0.450	-0.488
	(0.362)	(0.348)	(0.382)	(0.359)
Log_TA	0.537***	0.483***	-0.0669	0.537***
	(0.0916)	(0.0884)	(0.0966)	(0.0910)
D_E	-0.00639***	-0.00405*	-0.000538	-0.00639***
	(0.00233)	(0.00226)	(0.00252)	(0.00231)
Board_Size	-0.0697	-0.0697*	0.0167	-0.0697
	(0.0427)	(0.0411)	(0.0449)	(0.0425)
IND	-0.00834	-0.00937	0.0108	-0.00834
	(0.0123)	(0.0118)	(0.0129)	(0.0122)
Bank_Age	0.0207**	0.0170**	-0.00549	0.0207**
	(0.00825)	(0.00794)	(0.00860)	(0.00819)
Total_LoansTotalAssets	0.0588***	0.0491***	0.0192	0.0588***
	(0.0126)	(0.0122)	(0.0132)	(0.0125)
Constant	-4.394*	-2.473	9.148***	-4.394*
	(2.416)	(2.340)	(2.532)	(2.399)
Observations	891	891	863	891
R-squared	0.074	0.063	0.010	0.07

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 30: Regression results for the relationship between ROA and CRO characteristics

	OLS	Fixed	GMM	GLS
VARIABLES	ROA	ROA	L.ROA	ROA
CRO Presence	-0.177***	-0.181***	0.0240	-0.177***
	(0.0481)	(0.0455)	(0.0541)	(0.0477)
CRO Power	-0.00809	-0.00138	0.0280	-0.00809
	(0.0418)	(0.0396)	(0.0476)	(0.0415)
CRO Qualification	-0.0273	-0.0290	-0.0839**	-0.0273
	(0.0341)	(0.0323)	(0.0382)	(0.0339)
CRO Tenure	0.0118***	0.00988***	-0.00172	0.0118***
	(0.00334)	(0.00317)	(0.00371)	(0.00332)
CRO Gender	0.0290	0.0394	-0.00770	0.0290
	(0.0376)	(0.0356)	(0.0422)	(0.0373)
Log_TA	0.0951***	0.0881***	-0.00509	0.0951***
	(0.00952)	(0.00905)	(0.0107)	(0.00945)
D_E	-0.00225***	-0.00195***	-0.000265	-0.00225***
	(0.000242)	(0.000232)	(0.000279)	(0.000240)
Board_Size	-0.00227	-0.00219	-0.000220	-0.00227
	(0.00444)	(0.00420)	(0.00496)	(0.00441)
IND	-0.00258**	-0.00273**	-0.000299	-0.00258**
	(0.00128)	(0.00121)	(0.00142)	(0.00127)
Bank_Age	0.00156*	0.00110	-0.00121	0.00156*
	(0.000857)	(0.000813)	(0.000950)	(0.000851)
Total_LoansTotalAssets	0.00580***	0.00458***	0.00254*	0.00580***
	(0.00131)	(0.00125)	(0.00146)	(0.00130)
Constant	-1.045***	-0.798***	1.097***	-1.045***
	(0.251)	(0.239)	(0.280)	(0.249)
Observations	891	891	863	891
R-squared	0.176	0.158	0.018	0.016

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

In Summary:

Table 31: Summary of relationships among CRO characteristics and dependant variables

CRO Characteristics	Credit Risk		Regulatory Risk		Insolvency Risk		Performance	
	Association	Significance	Association	Significance	Association	Significance	Association	Significance
CRO Presence	-	No	-	No	-	No	-	Yes
CRO Power	+	Yes	+	Yes	-	No	-	No
CRO Qualification	-	No	+	No	+	No	-	No
CRO Tenure	-	Yes	-	Yes	-	No	+	Yes
Female CRO	-	No	-	No	-	Yes	+	No

Significance: Yes, if significant in OLS at least at 10% level.
Association: based on significance and/or majority of 4 models' outcome

- The table above seems to represent the findings of a study examining the relationship between Chief Risk Officer (CRO) characteristics and various forms of risk and performance. The study used Ordinary Least Squares (OLS) model, with results being deemed significant if they were at a 10% level or less. The "+" and "-" signs under "Association" likely represent positive or negative associations between the CRO characteristics and the risk/performance element, respectively.

- CRO presence has a negative and statistically significant association with bank's performance. But it has no impact on any of the bank's risk measures.

- A more senior or powerful CRO may lead banks to accept higher credit and regulatory risks, however, that may not improve the bank's performance. The results show that there is a positive and statistically significant relationship between CRO power from one side and both credit and regulatory risks from the other side.

- CRO qualification tend to be the least significant characteristics among the CRO attributes as it is the only characteristic with no impact on any of the five risk and performance measures.

- CRO Tenure is negatively and significantly associated with credit risk and regulatory risk. The results may indicate that the more time CRO spend in the role the better understanding they develop in terms of the risk policies and practices by the banks allowing them to manage risks more effectively leading to lower risk. Interestingly, the data indicates that this risk reduction does not affect bank's performance as there is a significant positive association between CRO Tenure and bank's ROE and ROA. These results show that CRO experience (tenure) is significantly more important than his/her finance and accounting qualification.

- The results indicate that banks with female CROs are likely to have lower insolvency risk, since there is a negative and statistically significant association between CRO Gender and insolvency risk. However, the results show that CRO gender is not significant in determining bank's credit risk, regulatory risk, or performance.

4.4 Findings and Results

The present research engaged in a comprehensive study of active commercial banks in the USA, from 2016 to 2019, to analyse the impact of Chief Risk Officer (CRO) characteristics on a bank's performance and associated risks. The study incorporated 241 banks and 966 bank-year observations. CRO variables were meticulously collected from various sources like banks' websites, annual reports, and 10-K statements. The study explored various dimensions such as the presence of a CRO, the power of a CRO, CRO qualification, tenure, and gender, and examined their effects on credit, regulatory, and insolvency risks and the banks' performance.

The data suggests that the inclusion of Chief Risk Officers (CROs) in banking institutions may have a detrimental effect on bank performance, as evidenced by significantly lower Return on Equity (ROE) and Return on Assets (ROA) in banks that employ CROs. These findings could be interpreted as an indication that the presence of a CRO may curtail the propensity for risk-taking by the bank's management, potentially to the detriment of the bank's performance. However, the appointment of a Chief Risk Officer (CRO) is not inherently adequate to enhance risk management procedures and practices. The analytical findings suggest that the mere presence of a CRO does not exert any discernible influence on the three critical risk indicators, namely credit risk, regulatory risk, or insolvency risk.

A CRO possessing greater authority is seemingly more inclined to accept elevated levels of credit and regulatory risk, potentially due to enhanced confidence stemming from their position of power. However, empirical evidence suggests that the influence of a CRO's power may not extend to affecting the insolvency risk of a bank or its performance.

Interestingly, CRO qualification appears to be the least consequential attribute when compared with other CRO characteristics. This insinuates that CRO qualification does not significantly influence a bank's risk or performance.

A positive correlation exists between the duration of a Chief Risk Officer's (CRO) tenure and a bank's performance, whereas a negative relationship is observed in terms of the bank's credit and regulatory risk. This suggests that longer-serving CROs can contribute to a reduction in credit and regulatory risk without undermining the bank's profitability or overall performance. However, the available data indicates that CRO tenure does not have a measurable impact on a bank's insolvency risk.

The gender of a Chief Risk Officer (CRO) generally appears to exert minimal influence on a bank's risk profile and overall performance. However, the data does indicate a likelihood of decreased insolvency risk in banks led by female CROs, lending support to scholarly literature that posits a greater risk aversion among female CROs. In the areas of credit risk, regulatory risk, and performance, CRO gender seemingly has no notable impact.

Chapter Five: Conclusions, Limitations and Future Research

5.1 Conclusions

The study found that the existence of a Risk Committee (RC) is associated with a negative impact on both the risk and performance of US commercial banks. However, this relationship varies depending on the specific type of risk being considered. More specifically, the negative relationship between RC existence and risk was significant only for credit risk, which is deemed the most consequential risk that commercial banks face. In other words, the presence of an RC was associated with a reduction in credit risk. This outcome could be attributed to the fact that due to the critical nature of credit risk; RCs might allocate more resources or give heightened attention to managing it. However, the existence of an RC didn't seem to reduce regulatory risk nor insolvency risk in a significant way. This could be due to a variety of reasons, including possible differences in how these types of risks are managed compared to credit risk, or the possibility that these risks are not as well-controlled by the risk management strategies implemented by RCs. Moreover, the study found an insignificant relationship between the existence of an RC and the Return on Equity (ROE) and Return on Assets (ROA), key measures of a bank's performance. This indicates that simply having an RC does not necessarily translate to better financial performance, at least not in a way that significantly impacts ROE and/or ROA. The explanation for this might involve the complex interplay between risk management and bank performance, which might be influenced by numerous other factors, such as overall corporate governance or the economic environment, which weren't explicitly captured in the models of this study.

The study examined the impact of RC size on risk and performance outcomes, with size referring to the number of members within a Risk Committee. Notably, the findings showed a positive and significant association between RC size and credit risk. In other words, banks with larger RCs tend to accept higher levels of credit risk. This relationship could suggest a higher level of confidence among banks with larger RCs in their ability to effectively manage and control credit risk. A larger committee may bring a broader range of perspectives and expertise, potentially enabling more comprehensive risk assessments and more effective decision-making. However, this positive association with credit risk does not appear to translate into higher risks in other areas or improved financial performance. Specifically, the size of RCs seemed to have no significant impact on regulatory risk, insolvency risk, Return on Equity (ROE), or Return on Assets (ROA). The lack of significant impact on regulatory and

insolvency risk could be due to these risks being influenced by factors beyond the RC's size, such as the overall quality and effectiveness of the risk management practices in place. For example, a smaller but highly effective committee could outperform a larger but less competent one. Similarly, the lack of significant relationship between RC size and ROE or ROA could suggest that merely having more people in an RC does not necessarily translate to better financial performance. Other factors, such as the quality of the committee members, their ability to work effectively as a team, the robustness of the bank's overall corporate governance structure, and external market conditions, among others, are likely also crucial determinants of a bank's ROE and ROA.

Independence in the context of this study refers to the degree to which RC members are free from influences that could conflict with the interest of the bank, for example, being a part of the bank's executive team or having a substantial financial interest in the bank. Interestingly, the study found that RC independence is insignificant for all risk and performance measures. The lack of significance, especially for risk measures, could be attributed to several reasons. It could be that while independence is beneficial for overall decision-making, it doesn't directly impact the management of specific types of risks. For instance, effectively managing these risks might depend more on other factors, such as the expertise of the RC members or the quality of the bank's risk management systems, rather than the independence of the committee members.

The qualifications of RC members capture their relevant education in finance and accounting domain. A significant finding of the study was the positive association between RC qualification and credit risk. This implies that banks with more qualified RC members are likely to accept a higher level of credit risk. This could be because qualified members bring a depth of knowledge and experience that allows them to understand, manage, and navigate the complexities associated with higher risk. It might also be reflective of a higher confidence in the bank's ability to manage the potential downsides of credit risk, given the expertise of their RC members. However, the impact of RC qualifications appears to be less pronounced when it comes to regulatory risk, insolvency risk, and bank's performance, with the study finding no significant association between RC qualifications and these risk and performance measures. This might be due to a variety of factors, including differences in how these risks are managed, the overall effectiveness of the bank's risk management practices, or the complexity of the regulatory environment, which were not fully captured in the models of this study.

The frequency of RC meetings is seen as a measure of the committee's activity level and its engagement in managing the bank's risk exposure. The study found that the number of RC

meetings is significantly and positively related to credit risk. Banks with more active RCs, that is, those holding meetings more frequently, appear to be willing to accept higher levels of credit risk. This might be explained by the fact that a more active RC could have a better handle on the bank's risk profile, leading to increased confidence in taking on more risk. This may also suggest a more dynamic engagement in the lending activities, which is a primary source of income for commercial banks. On the other hand, the study observed a significant negative relationship between the number of RC meetings and regulatory risk. This suggests that more active RCs might effectively contribute to reducing regulatory risk. The results find no significant relationship between RC meetings and bank's performance.

The analysis reveals that the presence of a Chief Risk Officer (CRO) in a banking institution has a noteworthy impact on the bank's overall performance. This positive and statistically significant association indicates that the role of a CRO is crucial for effective management, strategic planning, and risk mitigation. In the context of the bank's performance, the 'CRO Presence' variable appears to reflect an important mechanism for improving financial outcomes. However, the CRO presence found to be insignificant to all three risk measures. The statistical insignificance could be due to various factors such as the size of the data set, the variability of risk management practices across different banks, or other unobserved factors not considered in the model.

The power or seniority of a Chief Risk Officer (CRO) has a complex relationship with a bank's risk management and performance outcomes. The data reveals that there is a statistically significant positive relationship between the power of a CRO and both credit and regulatory risks. This finding suggests that banks with more senior or powerful CROs might be more likely to accept higher levels of credit and regulatory risks. One possible explanation for this could be that senior CROs, with their vast experience and expertise, are more confident in managing complex and high-risk portfolios. This acceptance of higher risks could also be a strategic move to chase higher returns, reflecting a more aggressive risk-appetite framework under the governance of senior CROs. However, it is essential to note that higher risk acceptance does not necessarily translate into poor risk management. Senior CROs may still be maintaining these risks within acceptable limits established by their respective institutions' risk appetite statements. The study found insignificant association between CRO power and insolvency risk, and the bank's performance. This might seem counterintuitive, as one might expect that more senior CROs, with their strategic capabilities and vast experience, would foster improved bank performance. However, this finding suggests that the increased risk-taking associated with more powerful CROs does not necessarily translate into improved financial performance. This could be due to the fact that higher levels of risk might lead to

higher instances of risk realization (such as loan defaults), thereby affecting the bank's financial performance negatively.

CRO qualifications appear to be the least consequential among the various attributes of a Chief Risk Officer. This is because, uniquely among the CRO attributes studied, qualifications were found to have no evident effect on any of the five risk and performance measures under consideration.

The tenure of a Chief Risk Officer (CRO) was found to have significant implications for a bank's risk profile and performance. More specifically, the study established that there is a negative and statistically significant relationship between CRO tenure and the credit risk and regulatory risk. The inverse relationship suggests that the longer a CRO serves in their role, the more effectively they manage risks. As CROs accumulate experience, they gain a more in-depth understanding of the bank's operations, risk profile, and the effectiveness of various risk mitigation strategies. This insight, combined with a more profound understanding of the institutional culture and risk appetite, allows them to craft more effective risk policies, resulting in lower levels of credit and regulatory. However, this effective risk reduction seems to come at the expense of the bank's performance. There is a positive association between CRO tenure and the bank's return on equity (ROE) and Return on Assets (ROA). This could suggest that more tenured CROs can reduce bank's credit and regulatory risk without compromising on bank's performance.

The gender of a Chief Risk Officer (CRO) demonstrated significant implications for insolvency risk only. The data showed a negative and statistically significant association between female CROs and insolvency risk, suggesting that banks with female CROs tend to have lower levels of insolvency risk. This could indicate that female CROs are potentially more risk-averse, or they adopt different risk management strategies that effectively mitigate insolvency risks. This observation aligns with a body of literature suggesting that female officers tend to be more conservative in their risk-taking, which in this context, results in lower insolvency risk for the banks they oversee. Furthermore, the study found insignificant associations between female CROs from one side and credit risk, regulatory risk, and bank's performance from the other side. Nevertheless, these findings contribute to the ongoing discussion around gender diversity in leadership roles, demonstrating that having a female CRO may have beneficial effects on bank's risk management.

The research outcomes and findings could have significant impact on multiple key stakeholders like regulators and standards-setters, banks, and investors.

The research findings present key implications that could significantly influence the policies and practices adopted by **standards-setters and regulators** in numerous capacities. The evidence highlighting that the existence of a Risk Committee (RC) lessens credit risk is a critical finding. This correlation suggests that regulatory bodies may want to push for the formal establishment of such committees within banks and other financial institutions. They could provide regulatory guidance or possibly mandate such bodies to ensure a robust risk management infrastructure within these entities. This measure could help to mitigate potential financial risks and ensure the stability of individual banks and the broader financial system. Further, the positive relationship between the presence of a Chief Risk Officer (CRO) and improved bank performance indicates the importance of having a designated executive in charge of risk management. Consequently, regulators may want to emphasize the need for such a role in banks, possibly through enforcement mechanisms or regulatory guidance. This could serve to enhance the resilience and performance of banks, thereby benefitting stakeholders and the larger economy.

Moreover, the research findings also suggest that regulators may want to consider guidelines around the optimal size of a Risk Committee. These guidelines could stipulate a minimum or maximum number of members, or propose a range, with the goal of ensuring an effective, manageable, and diverse committee. Further considerations could revolve around the specific qualifications desirable for RC members. This might include requisite experience in risk management, industry knowledge, or other relevant qualifications, thereby ensuring that committee members are adequately prepared to understand and address the risks inherent to their respective banks. Interestingly, the research sheds light on the potential value of gender diversity in risk management, with female CROs appearing to manage insolvency risk better. These findings could spur regulators to advocate for greater gender diversity in executive roles, particularly within the domain of risk management. They might consider policy initiatives or regulatory guidelines aimed at enhancing gender representation. This could not only lead to improved risk management but could also promote greater gender equity in the banking sector. Finally, the study suggests that CROs with longer tenures tend to manage risk more effectively. This finding could be grounds for regulatory bodies to encourage continuity in risk management leadership roles, potentially reducing frequent changes in these positions. Such continuity might offer more stable and consistent risk management strategies, benefiting banks by fostering a more predictable and well-managed risk environment. Overall, these research findings could significantly shape the future of regulatory practices and standards-setting, emphasizing the importance of robust risk management practices, gender diversity in leadership roles, and continuity in risk management.

Further, these research findings present a host of significant insights for **banks**, underscoring the role that robust risk management mechanisms, such as Risk Committees (RC) and Chief Risk Officers (CRO), can play in enhancing overall performance and reducing insolvency risks. One central finding is the critical role of a Risk Committee in managing credit risk. Given the clear correlation, U.S. commercial banks might contemplate voluntarily forming an RC, even if not mandated by regulators. Such a committee could prove instrumental in safeguarding the bank's financial health by managing and mitigating credit risk effectively.

Size of the RC also appears to be a significant factor, with larger RCs seemingly able to handle greater credit risk. Banks should, therefore, consider reviewing the size of their RCs, ensuring an optimal mix of members to cater to the credit risk environment in which they operate. This implies a thoughtful approach to RC membership, striving for a balance that can manage and absorb higher levels of credit risk effectively. Additionally, the research findings indicate a strong correlation between RC qualifications and a proactive approach to risk management, leading to an acceptance of higher credit risk. It suggests that banks should place a strong emphasis on the qualifications of RC members. Having highly skilled and experienced individuals on these committees could mean a more thorough and effective approach to risk management, facilitating the acceptance of higher credit risks without compromising stability.

Another noteworthy finding is the positive influence a CRO has on bank performance. For banks that don't currently have a CRO, this might prompt consideration of appointing such a role. The CRO could provide the necessary leadership in managing various types of risks, contributing to better financial outcomes and overall bank performance. The research also identifies a positive correlation between CRO tenure and effective risk management. As such, banks should be cognizant of the potential advantages of CRO continuity, striving to retain their CROs for extended periods. Long-standing CROs, well-acquainted with the institution's risk profile and management strategies, could potentially contribute to more effective risk management. Interestingly, the findings reveal that banks with female CROs tend to have lower insolvency risks. This may influence banks' hiring decisions, prompting them to strive for greater gender diversity, particularly for high-ranking risk management positions like the CRO. This could not only enhance risk management but also drive progress toward greater gender parity in banking leadership roles.

Finally, an intriguing insight from the study is that CROs with finance or accounting qualifications show no significant impact on the bank's risk or performance. This could inform banks' recruitment strategies for the CRO position and shape their decisions around further education opportunities for current CROs. Rather than focusing strictly on finance or

accounting backgrounds, banks might want to seek a broader set of skills and experiences in their CRO candidates, potentially bringing novel perspectives to the role and contributing to more robust risk management.

The research findings also have crucial implications for **investors** as key stakeholders, providing them with tangible parameters to evaluate the risk management capabilities and overall governance of banks. The presence of a Risk Committee (RC) and a Chief Risk Officer (CRO) are linked to lower risk and enhanced bank performance, respectively. These factors are likely to serve as valuable reference points for investors when considering investment opportunities in banks. When assessing the governance of a bank, investors could account for the presence and characteristics of the RC and CRO. For instance, the size of the RC could be indicative of the bank's capacity to handle credit risk, with larger committees being associated with the ability to manage greater credit risk. Additionally, the qualifications held by the RC members could be a pointer to their ability to proactively manage and accept higher credit risk.

The tenure of the CRO also comes out as an important consideration. The research suggests that CROs with longer tenures are more effective in managing credit and regulatory risks, likely due to their deeper understanding of the bank's risk profile and management strategies. Thus, investors could factor in the CRO's tenure when gauging a bank's potential performance and risk management capacity. Interestingly, the research shows several relationships, such as the independence of the RC and risk measures, as insignificant. This revelation could make investors more aware of a bank's practices and underlying risk factors, encouraging them to delve deeper and not rely solely on traditional measures of risk management efficacy.

Finally, the findings suggest that banks with female CROs demonstrate lower insolvency risk and superior performance. This insight could prompt investors to regard gender diversity in leadership roles as a potential contributing factor to a bank's performance and risk profile. Recognizing this correlation could lead investors to give weightage to gender diversity when making investment decisions, promoting gender equity while potentially securing better investment outcomes.

5.2 Limitations

This study provides a comprehensive investigation into the association between risk committee (RC) characteristics, Chief Risk Officer (CRO) attributes, and the risk and performance of US commercial banks. However, it is not without limitations. First, the findings are based on data from commercial banks in the US only. This restricts the generalizability of the findings to other regions or different types of financial institutions, such as investment banks, non-banking financial corporations, or credit unions.

Secondly, although the study explored various aspects of RCs and CROs, it did not capture all potential factors that could influence risk and performance outcomes. For instance, it did not account for factors such as the risk culture of the organization, the effectiveness of risk communication within the bank, the technology employed in risk management, or the individual behavioural attributes of RC or CRO members. The complex interplay between these variables could potentially have a considerable influence on the risk and performance outcomes.

Third, the study assumes linear relationships between the independent and dependent variables, which may oversimplify the actual dynamics. For instance, the relationship between the size of the risk committee and risk could be non-linear or the effectiveness of CRO could depend on the interaction of several factors such as power, tenure, and qualifications.

Fourth, the study did not consider the time-varying nature of the relationships studied. Risk management practices and their outcomes can evolve over time due to changing regulations, economic conditions, or internal organizational changes.

Fifth, the measurement of certain variables, such as CRO power and independence of RC members, might be subject to different interpretations, which might influence the robustness of the findings.

Finally, the study is correlational and thus can't establish causality. For instance, the finding of a positive association between the size of the RC and credit risk could either indicate that larger RCs lead to higher credit risk, or that banks with higher credit risk tend to have larger RCs.

These limitations do not undermine the validity or significance of the study but instead point towards avenues for further research. Each limitation, in fact, can be viewed as a

steppingstone for future investigations to build upon, refining our understanding of risk management in the banking sector. The insights provided by this study, even within its constraints, are invaluable for regulators, banks, scholars and practitioners in the field, establishing a foundation that future research can expand upon.

5.3 Future Research

Future research could address these limitations to extend the understanding of the relationships between RCs, CROs, and bank risk and performance. Here are some suggestions:

Cross-national and cross-institutional studies: Investigating these relationships in different countries and across different types of financial institutions would enhance the generalizability of the findings.

Longitudinal studies: Examining these relationships over time could provide insights into the dynamics of risk management practices and their impacts.

Inclusion of additional variables: Future studies could include other potentially relevant factors such as organizational risk culture, the role of technology in risk management, and individual behavioural attributes of RC or CRO members.

Non-linear and interaction models: Future research could explore potential non-linear relationships or interactions between different independent variables and their impacts on risk and performance outcomes.

Experimental or quasi-experimental designs: Studies that can establish causal relationships between the independent and dependent variables would significantly strengthen the understanding of these relationships.

Qualitative studies: In-depth interviews or case studies could provide nuanced insights into how RCs and CROs operate, how they interact with other elements of the organization, and how these interactions influence risk and performance outcomes.

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Appendices

Appendix 1: Banks Sample (name and ticker)

Name	Ticker
1ST SOURCE CORP	SRCE us EQUITY
ACNB CORP	ACNB us EQUITY
ALLEGIANCE BANCSHARES INC	ABTX us EQUITY
ALTABANCORP	ALTA us EQUITY
AMER NATL BNKSHS/DANVILLE VA	AMNB us EQUITY
AMERICAN RIVER BANKSHRS (CA)	AMRB us EQUITY
AMERIS BANCORP	ABCB us EQUITY
AMERISERV FINANCIAL INC	ASRV us EQUITY
AMES NATIONAL CORP	ATLO us EQUITY
ARROW FINANCIAL CORP	AROW UW EQUITY
ASSOCIATED BANC-CORP	ASB us EQUITY
ATLANTIC CAPITAL BANCSHARES	ACBI us EQUITY
ATLANTIC UNION BANKSHARES CO	AUB us EQUITY
AUBURN NATL BANCORPORATION	AUBN us EQUITY
BANC OF CALIFORNIA INC	BANC us EQUITY
BANCFIRST CORP	BANF us EQUITY
BANCORP INC/THE	TBBK us EQUITY
BANCORPSOUTH BANK	BXS us EQUITY
BANK OF AMERICA CORP	BAC us EQUITY
BANK OF COMMERCE HOLDINGS	BOCH us EQUITY
BANK OF HAWAII CORP	BOH us EQUITY
BANK OF MARIN BANCORP/CA	BMRC us EQUITY
BANK OF MONTREAL	BMO us EQUITY
BANK OF NOVA SCOTIA	BNS us EQUITY
BANK OF SOUTH CAROLINA CORP	BKSC us EQUITY
BANK OZK	OZK us EQUITY
BANKWELL FINANCIAL GROUP INC	BWFG us EQUITY
BANNER CORPORATION	BANR us EQUITY
BAR HARBOR BANKSHARES	BHB us EQUITY
BARCLAYS PLC	BARC LN EQUITY
BERKSHIRE BANCORP INC	BERK us EQUITY
BOK FINANCIAL CORPORATION	BOKF us EQUITY
BOSTON PRIVATE FINL HOLDING	BPFH us EQUITY
BRIDGE BANCORP INC	BDGE us EQUITY
BRYN MAWR BANK CORP	BMTC us EQUITY
C & F FINANCIAL CORP	CFFI us EQUITY
CADENCE BANCORP	CADE us EQUITY
CALVIN B. TAYLOR BANKSHARES	TYCB us EQUITY
CAMDEN NATIONAL CORP	CAC us EQUITY
CAN IMPERIAL BK OF COMMERCE	CM us EQUITY
CANANDAIGUA NATIONAL CORP	CNND us EQUITY
CAPITAL CITY BANK GROUP INC	CCBG us EQUITY
CAPSTAR FINANCIAL HOLDINGS I	CSTR us EQUITY
CATHAY GENERAL BANCORP	CATY us EQUITY

CCFNB BANCORP INC	CCFN us EQUITY
CENTRAL PACIFIC FINANCIAL CO	CPF us EQUITY
CENTRAL VALLEY COMM BANCORP	CVCY us EQUITY
CENTURY BANCORP INC -CL A	CNBKA UW EQUITY
CHEMUNG FINANCIAL CORP	CHMG us EQUITY
CHOICEONE FINANCIAL SVCS INC	COFS us EQUITY
CIT GROUP INC	CIT us EQUITY
CITIZENS & NORTHERN CORP	CZNC us EQUITY
CITIZENS BANCORP OF VIRGINIA	CZBT us EQUITY
CITIZENS FINANCIAL GROUP	CFG us EQUITY
CITIZENS FINANCIAL SERVICES	CZFS us EQUITY
CITIZENS HOLDING COMPANY	CIZN us EQUITY
CITY HOLDING CO	CHCO us EQUITY
CIVISTA BANCSHARES INC	CIVB us EQUITY
CNB CORP	CNBW us EQUITY
CNB FINANCIAL CORP/PA	CCNE us EQUITY
COLONY BANKCORP	CBAN us EQUITY
COLUMBIA BANKING SYSTEM INC	COLB us EQUITY
COMERICA INC	CMA us EQUITY
COMMERCE BANCSHARES INC	CBSH us EQUITY
COMMERCIAL NATL FINL CORP/PA	CNAF us EQUITY
COMMUNITY BANCORP INC/VT	CMTV us EQUITY
COMMUNITY BANK SYSTEM INC	CBU us EQUITY
COMMUNITY BANKERS TRUST CORP	ESXB us EQUITY
COMMUNITY FINANCIAL CORP/THE	TCFC us EQUITY
COMMUNITY TRUST BANCORP INC	CTBI us EQUITY
CONNECTONE BANCORP INC	CNOB us EQUITY
CONSUMERS BANCORP INC	CBKM us EQUITY
COUNTY BANCORP INC	ICBK us EQUITY
CROGHAN BANCSHARES INC	CHBH us EQUITY
CSB BANCORP INC	CSBB us EQUITY
CULLEN/FROST BANKERS INC	CFR us EQUITY
CUSTOMERS BANCORP INC	CUBI us EQUITY
CVB FINANCIAL CORP	CVBF us EQUITY
DIMECO INC	DIMC us EQUITY
EAGLE BANCORP INC	EGBN us EQUITY
EAGLE FINANCIAL SERVICES INC	EFSI us EQUITY
EAST WEST BANCORP INC	EWBC us EQUITY
EMCLAIRE FINANCIAL CORP	EMCF us EQUITY
ENB FINANCIAL CORP	ENBP us EQUITY
ENTERPRISE BANCORP INC	EBTC us EQUITY
ENTERPRISE FINANCIAL SERVICE	EFSC us EQUITY
EQUITY BANCSHARES INC - CL A	EQBK us EQUITY
EVANS BANCORP INC	EVBN us EQUITY
F & M BANK CORP	FMBM us EQUITY
FARMERS & MERCHANTS BANCO/CA	FMCB us EQUITY
FARMERS NATL BANC CORP	FMNB us EQUITY
FAUQUIER BANKSHARES INC	FBSS us EQUITY
FB FINANCIAL CORP	FBK us EQUITY
FIDELITY D&D BANCORP INC	FDBC us EQUITY
FIFTH THIRD BANCORP	FITB us EQUITY
FINANCIAL INSTITUTIONS INC	FISI us EQUITY

FIRST BANCORP INC/ME	FNLC us EQUITY
FIRST BANCORP/NC	FBNC us EQUITY
FIRST BANCSHARES INC/MS	FBMS us EQUITY
FIRST BUSEY CORP	BUSE us EQUITY
FIRST BUSINESS FINANCIAL SER	FBIZ us EQUITY
FIRST CITIZENS BCSHS -CL A	FCNCA UW EQUITY
FIRST COMMONWEALTH FINL CORP	FCF us EQUITY
FIRST COMMUNITY CORP	FCCO us EQUITY
FIRST FINANCIAL BANCORP	FFBC us EQUITY
FIRST FINANCIAL CORP/INDIANA	THFF us EQUITY
FIRST FINL BANKSHARES INC	FFIN us EQUITY
FIRST FOUNDATION INC	FFWM us EQUITY
FIRST HAWAIIAN INC	FHB us EQUITY
FIRST HORIZON CORP	FHN us EQUITY
FIRST INTERNET BANCORP	INBK us EQUITY
FIRST INTERSTATE BANCSYS-A	FIBK us EQUITY
FIRST KEYSTONE CORP	FKYS us EQUITY
FIRST MERCHANTS CORP	FRME us EQUITY
FIRST MID BANCSHARES INC	FMBH us EQUITY
FIRST MIDWEST BANCORP INC/IL	FMBI us EQUITY
FIRST OF LONG ISLAND CORP	FLIC us EQUITY
FIRST REPUBLIC BANK/CA	FRC us EQUITY
FIRST UNITED CORP	FUNC us EQUITY
FIRST US BANCSHARES INC	FUSB us EQUITY
FLUSHING FINANCIAL CORP	FFIC us EQUITY
FNB CORP	FNB us EQUITY
FNCB BANCORP INC	FNCB us EQUITY
FRANKLIN FINANCIAL SERVICES	FRAF us EQUITY
FULTON FINANCIAL CORP	FULT us EQUITY
GERMAN AMERICAN BANCORP	GABC us EQUITY
GLACIER BANCORP INC	GBCI us EQUITY
GLEN BURNIE BANCORP	GLBZ us EQUITY
GREAT SOUTHERN BANCORP INC	GSBC us EQUITY
GREAT WESTERN BANCORP INC	GWB us EQUITY
GUARANTY BANCSHARES INC	GNTY us EQUITY
HANCOCK WHITNEY CORP	HWC us EQUITY
HANMI FINANCIAL CORPORATION	HAFC us EQUITY
HAWTHORN BANCSHARES INC	HWBK us EQUITY
HEARTLAND FINANCIAL USA INC	HTLF us EQUITY
HERITAGE COMMERCE CORP	HTBK us EQUITY
HOME BANCSHARES INC	HOMB us EQUITY
HOMESTREET INC	HMST us EQUITY
HOPE BANCORP INC	HOPE us EQUITY
HORIZON BANCORP INC/IN	HBNC us EQUITY
HOWARD BANCORP INC	HBMD us EQUITY
HUNTINGTON BANCSHARES INC	HBAN us EQUITY
INDEPENDENT BANK CORP - MICH	IBCP us EQUITY
INDEPENDENT BANK CORP/MA	INDB us EQUITY
INDEPENDENT BANK GROUP INC	IBTX us EQUITY
INTERNATIONAL BANCSHARES CRP	IBOC us EQUITY
INVESTAR HOLDING CORP	ISTR us EQUITY
ISABELLA BANK CORP	ISBA us EQUITY

JEFFERSONVILLE BANCORP/N Y	JFBC us EQUITY
JPMORGAN CHASE & CO	JPM us EQUITY
JUNIATA VALLEY FINL CORP-PA	JUVF us EQUITY
KENTUCKY BANCSHARES INC	KTYB us EQUITY
KEYCORP	KEY us EQUITY
LAKELAND BANCORP INC	LBAI us EQUITY
LAKELAND FINANCIAL CORP	LKFN us EQUITY
LANDMARK BANCORP INC	LARK us EQUITY
LCNB CORPORATION	LCNB us EQUITY
LIVE OAK BANCSHARES INC	LOB us EQUITY
LLOYDS BANKING GROUP PLC	LLOY LN EQUITY
M & T BANK CORP	MTB us EQUITY
MACATAWA BANK CORP	MCBC us EQUITY
MECHANICS BANK /WALNUT CREEK	MCHB us EQUITY
MERCANTILE BANK CORP	MBWM us EQUITY
MID PENN BANCORP INC	MPB us EQUITY
MIDDLEFIELD BANC CORP	MBCN us EQUITY
MIDLAND STATES BANCORP INC	MSBI us EQUITY
MIDWESTONE FINANCIAL GROUP I	MOFG us EQUITY
MVB FINANCIAL CORP	MVBF us EQUITY
N B T BANCORP INC	NBTB us EQUITY
NATIONAL BANKSHARES INC/VA	NKSH us EQUITY
NATWEST GROUP PLC -SPON ADR	NWG us EQUITY
NICOLET BANKSHARES INC	NCBS us EQUITY
NORWOOD FINANCIAL CORP	NWFL us EQUITY
OAK VALLEY BANCORP	OVLY us EQUITY
OHIO VALLEY BANC CORP	OVBC us EQUITY
OLD NATIONAL BANCORP	ONB us EQUITY
OLD POINT FINANCIAL CORP	OPOF us EQUITY
OLD SECOND BANCORP INC	OSBC us EQUITY
ORRSTOWN FINL SERVICES INC	ORRF us EQUITY
PACIFIC FINANCIAL CORP	PFLC us EQUITY
PACIFIC MERCANTILE BANCORP	PMBC us EQUITY
PACIFIC PREMIER BANCORP INC	PPBI us EQUITY
PACWEST BANCORP	PACW us EQUITY
PARK NATIONAL CORP	PRK us EQUITY
PARKE BANCORP INC	PKBK us EQUITY
PEAPACK GLADSTONE FINL CORP	PGC us EQUITY
PENNS WOODS BANCORP INC	PWOD us EQUITY
PEOPLES BANCORP INC	PEBO us EQUITY
PEOPLES BANCORP INC/MD	PEBC us EQUITY
PEOPLES BANCORP OF NC	PEBK us EQUITY
PEOPLES FINANCIAL SERVICES	PFIS us EQUITY
PINNACLE FINANCIAL PARTNERS	PNFP us EQUITY
PNC FINANCIAL SERVICES GROUP	PNC us EQUITY
PREFERRED BANK/LOS ANGELES	PFBC us EQUITY
PREMIER FINANCIAL BANCORP	PFBI us EQUITY
PROSPERITY BANCSHARES INC	PB us EQUITY
PSB HOLDINGS INC (WI)	PSBQ us EQUITY
QCR HOLDINGS INC	QCRH us EQUITY
QNB CORP	QNBC us EQUITY
REGIONS FINANCIAL CORP	RF us EQUITY

RELIANT BANCORP INC	RBNC us EQUITY
RENASANT CORP	RNST us EQUITY
REPUBLIC BANCORP INC-CLASS A	RBCAA us EQUITY
REPUBLIC FIRST BANCORP INC	FRBK us EQUITY
ROYAL BANK OF CANADA	RY us EQUITY
S & T BANCORP INC	STBA us EQUITY
SANDY SPRING BANCORP INC	SASR us EQUITY
SB FINANCIAL GROUP INC	SBFG us EQUITY
SEACOAST BANKING CORP/FL	SBCF us EQUITY
SELECT BANCORP INC	SLCT us EQUITY
SERVISFIRST BANCSHARES INC	SFBS us EQUITY
SHORE BANCSHARES INC	SHBI us EQUITY
SIERRA BANCORP	BSRR us EQUITY
SIGNATURE BANK	SBNY us EQUITY
SIMMONS FIRST NATL CORP-CL A	SFNC us EQUITY
SMARTFINANCIAL INC	SMBK us EQUITY
SOUTH STATE CORP	SSB us EQUITY
SOUTHERN FIRST BANCSHARES	SFST us EQUITY
SOUTHERN NATL BANCORP OF VA	SONA us EQUITY
SOUTHSIDE BANCSHARES INC	SBSI us EQUITY
STERLING BANCORP/DE	STL us EQUITY
STOCK YARDS BANCORP INC	SYBT us EQUITY
SUMMIT FINANCIAL GROUP INC	SMMF us EQUITY
SURREY BANCORP	SRYB us EQUITY
SVB FINANCIAL GROUP	SIVB us EQUITY
SYNOVUS FINANCIAL CORP	SNV us EQUITY
TCF FINANCIAL CORP	TCF us EQUITY
TEXAS CAPITAL BANCSHARES INC	TCBI us EQUITY
THOMASVILLE BANCSHARES INC	THVB us EQUITY
TOMPKINS FINANCIAL CORP	TMP us EQUITY
TORONTO-DOMINION BANK	TD us EQUITY
TOWNE BANK	TOWN us EQUITY
TRI CITY BANKSHARES CORP	TRCY us EQUITY
TRICO BANCSHARES	TCBK us EQUITY
TRISTATE CAPITAL HLDGS INC	TSC us EQUITY
TRUIST FINANCIAL CORP	TFC us EQUITY
TRUSTMARK CORP	TRMK us EQUITY
UMB FINANCIAL CORP	UMBF us EQUITY
UNION BANKSHARES INC /VT	UNB us EQUITY
UNITED BANCORP INC/OHIO	UBCP us EQUITY
UNITED BANCSHARES INC/OHIO	UBOH us EQUITY
UNITED BANKSHARES INC	UBSI us EQUITY
UNITED COMMUNITY BANKS/GA	UCBI us EQUITY
UNITED SECURITY BANCSHARE/CA	UBFO us EQUITY
UNITY BANCORP INC	UNTY us EQUITY
UNIVEST FINANCIAL CORP	UVSP us EQUITY
US BANCORP	USB us EQUITY
UWHARRIE CAPITAL CORP	UWHR us EQUITY
VALLEY NATIONAL BANCORP	VLY us EQUITY
VERITEX HOLDINGS INC	VBTX us EQUITY
VIRGINIA NATIONAL BANKSHARES	VABK us EQUITY
WASHINGTON FEDERAL INC	WAFD us EQUITY

WASHINGTON TRUST BANCORP	WASH us EQUITY
WEBSTER FINANCIAL CORP	WBS us EQUITY
WELLS FARGO & CO	WFC us EQUITY
WESBANCO INC	WSBC us EQUITY
WEST BANCORPORATION	WTBA us EQUITY
WESTAMERICA BANCORPORATION	WABC us EQUITY
WESTERN ALLIANCE BANCORP	WAL us EQUITY
WINTRUST FINANCIAL CORP	WTFC us EQUITY