The Influence of Corporate Governance on Bank Risk and Performance: Evidence from the US Banking Sector

By

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Abstract

The thesis aims to contribute to the literature on bank governance by examining the influence of board characteristics on the performance, risk exposure and capital structure adjustment of the U.S. banks.

Chapter 2 sheds light on the importance of corporate governance and discusses in detail the mechanisms it offers to deal with the agency problems specific to banks. The chapter also provides a review of the extant literature on bank corporate governance and discusses how bank governance is different from the governance of non-financial firms.

More specifically, chapter 3 analyses the appointments of outside CEOs of financial and non-financial firms as independent directors on US bank boards and their implications for the banks and the outside CEO firms. The study shows that outside CEOs from financial firms match with less traditional banks, while CEOs from non-financial firms match with more lending-oriented banks. Appointing outside CEOs from financial firms generates higher abnormal returns for the appointing bank as compared to other director appointments and long-term benefits for both the appointing bank and for the outside CEO firm. In contrast, appointing CEOs from non-financial firms does not benefit the bank while it generates positive abnormal returns and longer-term benefits, especially in terms of credit access, for the firm of the outside CEO. Overall, although considered highly skilled directors, outside CEOs are not always beneficial to bank boards.

Chapter 4 investigates the impact of board independence on a bank's capital management using a sample of US-listed banks. The study shows that banks with more

independent boards privilege lower target capital ratios and adjust more slowly (quickly) towards the target ratio when they are undercapitalized (overcapitalized). Replacing independent directors without financial expertise with financial expert directors, as advocated by regulators, further lowers target ratios but accelerates the recapitalization process of undercapitalized banks by means of equity issuance. Further tests, exploiting exogenous variation in regulatory scrutiny across banks, show that a stronger regulatory oversight induces independent directors, especially when they have financial expertise, to favour a bank capital management less aligned to shareholder interests.

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List of Abbreviations

BHC	Bank Holding Company
BIS	Bank of International Settlement
CARs	Cumulative Abnormal Returns
CEO	Chief Executive Officer
CFO	Chief Financial Officer
FDIC	Federal Deposit Insurance Corporation
FED	Federal Reserve Bank
OLS	Ordinary Least Square
pp	Percentage Point
ROA	Return on Assets
ROE	Return on Equity
SEC	Security Exchange Commission
TARP	Trouble Asset Relief Program
US	United States
UK	United Kingdom

1 Introduction

1.1 Introduction

In the last decade, a new field of research has gained momentum within the corporate governance literature dedicated to the corporate governance of banks. The thesis aims to contribute to this stream of the literature by examining the influence of directors' specific characteristics and corporate board structure on performance (and risk exposure) and the capital structure adjustment of U.S. banks.

The two main reasons behind studying corporate governance specifically for banks are: first, banks are the backbone of a financial system providing financial intermediation services, thus a thriving banking sector helps grow the economy, where bank failures result in destabilisation of the economic and political situation of a country. This important role that banks play in the financial sector makes the study of their corporate governance a vital issue from both public and private perspectives. Second, the corporate governance of banks might be different than in other firms. Scholars have argued that one of the reasons behind the difficulty in examining the corporate governance impact on bank performance is the banks' special business nature which includes opaqueness and information asymmetry. In this regard, limiting the study to one specific industry would potentially facilitate the identification of the relationship between various internal governance mechanisms and banks' performance.

Moreover, the global financial crisis of 2007 – 2009 has also highlighted the integral role weak corporate governance arrangements have played in triggering systemic distress in the financial sector. Consequently, in an interest to safeguard the financial stability of financial institutions, numerous proposals have been made by policymakers and scholars to

provide a tailored corporate governance framework for banks. These measures range from improving the advising and monitoring quality of corporate boards by; identifying optimal board independence for banks, having qualified directors on bank boards, designing effective executive compensation plans, and requiring systemically large banks to have stringent governance policies.

However, the existing research literature provides limited and conflicting evidence on the impact of corporate governance on the financial stability of banks. Thus, it remains a matter of discussion how banks' corporate boards can contribute to safeguarding banks' financial solidity (Kirkpatrick, 2009; Mehran et al., 2011; Erkens et al., 2012). Along these lines, the debate has attempted to understand which board structures and directors' specific skills and experiences might be more effective in monitoring and advising bank managers (Andres and Vallelado, 2008; Erkens et al., 2012; Anginer et al., 2016).

The thesis examines two themes of banks' stability, that is, bank performance and capital dynamics, which relate to an ongoing corporate governance debate on identifying directors that suit the complex business nature of banking sector. The focus of the empirical chapters is on the U.S. banking market for the period between 2001 and 2014.

1.2 Contributions of the Thesis

After the financial crisis, a consensus has developed among policymakers and researchers that the corporate governance policies of the pre-crisis era failed to safeguard against the excessive risk-taking in the banking sector. Consequently, significant attention has been drawn to restructuring the governance arrangements in banking. These reforms and restructuring processes favoured the research on the analysis of the implications of the board structures on bank risk exposure and performance. The studies on bank governance

presented here contribute to the extant literature by examining the impact of an appropriate board size and board independence (Adams and Mehran, 2008; Pathan, 2009; Aebi et al., 2012; Vallascas et al., 2017), directors' qualifications and skills (Kirkpatrick, 2009; Mehran et al., 2011; Aebi et al., 2012), and executive compensation plans (Hagendorff and Vallascas, 2011; Belkhir and Boubaker, 2013; Srivastav et al., 2014) on various aspects of bank stability and performance.

Building on these studies, this thesis presents two empirical chapters that extend the literature on banks' corporate governance. The following section offers detail on the research questions, findings and contribution each empirical chapter makes to the extant literature.

1.2.1 Outside CEOs of Financial and Non-Financial Firms as Independent Directors on Bank Boards

This chapter contributes to the stream of literature on director-board matching in the banking sector and the post-appointment effect of directors with extensive human and social capital, that is CEO directors, on the monitoring and advising quality of appointing bank boards. Recent regulatory guidelines (BIS, 2010; 2015; OCC, 2016) and initiatives implemented post the global crisis for the banking industry stress that banks should appoint independent directors with appropriate knowledge and skills to advise and monitor bank executives.[1] A large number of finance and management studies support this request by

[1] For instance, the Dodd Frank Act (2010) requires that banks with a volume total assets above 10 billion US dollars appoint at least one expert in risk-management in risk committees consisting of all independent directors. In Europe, the IV Capital Requirement Directive (2013)

showing that the human and social capital of independent directors heavily influence their performance when they sit on the board of non-financial firms (Carpenter et al., 2001; Certo et al., 2001; Kor and Sundaramurthy, 2009). However, the evidence on whether, and which components of, the human and social capital of independent directors matter in the case of banks is surprisingly limited and confined to the period of the global financial crisis (Fernandes and Fich, 2012; Minton et al., 2014).

This chapter aims to analyse the determinants and the performance effects of appointing independent directors onto bank boards that share a similar level of managerial skill, as measured by being CEO of another firm, but differ in terms of the industry association, that is, being the CEO of a financial or, a non-financial firm.

For the empirical analysis, a data sample of 3,420 directors' appointments at 496 U.S. banks has been collected from 2001 to 2014. Appointed directors are further classified as CEO and Non-CEOs based on their current employment status at their parent companies and the sector (financial and non-financial) to which the parent company belongs.

Specifically, the first chapter aims to address five empirical questions:

The first question raised is what drives the matching between bank boards and outside CEOs? This question is important as it is a prior unclear whether the appointment of CEO directors on bank boards is always in the interests of the appointing banks. The grounds for the notion stems from the specific nature of banking business which can influence the demand and supply side of outside CEOs for bank boards and related

highlights the importance of outside director knowledge and skills to be appointed in specific board committee.

outcomes post-appointment. Specifically, from the demand side, as banks have a very diversified business model, the appointment of outside CEOs from any sector (financial or non-financial) can provide informational advantage to bank boards. Nevertheless, the magnitude of these benefits, and the related identification of which outside CEO might be preferable to appoint, depends on how much the industry knowledge of the outside CEO relates to the primary segment of banks' business model. While from the supply side of CEO directors, I investigate under what conditions this matching is beneficial for the appointing bank in the post-appointment era and/or specifically for the CEO's firm. The intuition behind studying the supply side of CEO directors stems from the fact that the incentives of CEO directors to act as a "truly independent directors" could significantly vary based on the business model of the appointing bank. For instance, the appointment of CEOs on lending focused banks may raise their expectations regarding financial advantages from the board membership and this could impair the benefits brought by the skills of the CEO director on bank board.

To answer the question on director-board matching, I start by distinguishing CEO directors based on the industries in which they are employed, that is, CEO of financial firms and CEO of non-financial firms. Second, I account for the business model of the appointing bank by broadly distinguishing lending-oriented banks from those of non-lending banks. For the empirical analysis, I employ a multinomial logit model to determine the appointment probability of each type of director. The results show that the appointment probability of CEO directors coming from financial and non-financial firms is largely driven by both endogenous and exogenous determinants. Specifically, the findings show that CEO directors from the financial firms are appointed by less traditional banks (non-lending-oriented banks), while CEO directors from non-financial firms are appointed at lending-oriented banks. Moreover, it is also revealed that banks prefer to appoint financial firm CEO directors

during periods of financial crisis and regulatory reforms. Overall, the results highlight the importance of the industry of the CEO firm when it comes to the appointment of such directors on to bank boards. Moreover, directors' working experience in the financial industry also matters in the banking sector, as it requires directors to have financial expertise and knowledge about the regulatory environment to perform board duties efficiently and effectively.

The second question raised in this chapter is how the shareholders of banks and CEO firms react to the appointment of a CEO as a bank director. Specifically, from bank shareholders' perspective, an investigation has been carried out to examine market reaction on the appointment of directors based on their managerial skills and the industry of their firm. The grounds for the notion that investors may react differently to the appointment of directors who differ in terms of managerial skills and/or industry experience, stems from the certification hypothesis suggesting that abnormal returns are expected when firms appoint a director with exceptional skills because the market anticipates financial stability and better performance of the appointing firm in the long run. To answer this question, the standard event study methodology has been employed.

Overall, the findings suggest that irrespective of directors' managerial skills investors of the appointing bank only value an on-going working experience of the appointed directors within the financial industry. Additional analysis shows that abnormal returns on the appointment of directors from non-financial industry only materialize if the appointed director has specific additional human and social capital. In summary, the results highlight the fact that in specialised industry like banking investors value the appointment of directors who are believed to hold industry expertise or knowledge about the regulatory environment.

Next, a similar analysis is conducted to capture the investors' reaction of the appointed CEO's firm. The notion that shareholders of the CEO firm may perceive the appointment of their CEO on to a bank board as a positive signal emerges from the literature suggesting that shareholders anticipate financial benefits for their firms from a board membership of financial institutions (Perry and Peyer, 2005). The findings from this analysis reveal that only the investors of non-financial firm show abnormal returns when their CEO is appointed on to the board of a lending-oriented bank.

The third question raised in this chapter examines the influence of directors' appointment on the long run performance and risk measures of banks. Following the notion that the directors' skills and expertise have an impact on the strategic advice to the appointing firm management. This question aims to analyse the impact of appointed directors on the various aspects of bank financials which includes business models, profitability, and risk measures. This question especially answers the on-going banking governance quest on identifying directors' specific characteristics that may affect the business model, improve overall performance and limit risk exposure.

The results suggest that the appointment of CEO directors managing financial and non-financial firms has a significantly different effect on the profitability and risk measures of the appointing banks. In particular, the appointment of a CEO of a non-financial firm onto a bank board, is followed by an increase in the lending activity of the bank, while the appointment of a financial firm CEO is followed by an increase in non-interest-based activities. Furthermore, increase (decrease) in the profitability (risk) measures are only evident in the post-appointment era of financial firms CEO directors onto bank boards. These results provide insight into the differential effect of directors' preference regarding

the strategic decision and firm policy stemming from their industry relevant experience and the industry of their firms.

The fourth question raised in the chapter is to examine how the appointment of CEO directors managing financial and non-financial firms affect the monitoring quality of the board of the appointing bank. The view stems from the literature suggesting that the industry-relevant experience of independent directors equips them with industry-specific knowledge and expertise that help them critically evaluate managerial decision making, consequently enhance their monitoring efficiency. While the other group of studies provides a contrary view by suggesting that directors from the appointing firm industry might be socially connected and consequently, have a sympathetic attitude towards the management which might impair their monitoring capabilities.

Building on these studies an empirical investigation has been carried out to test the potential differences in the CEO pay-performance and performance-turnover sensitivity based on CEO directors from financial and non-financial firms. The results show that the presence of an outside CEO who is managing a financial firm on to a bank board increases the monitoring quality of the board as such a director increases both measures of board monitoring that is pay-performance and performance-turnover sensitivity. While the presence of an outside CEO from the non-financial firm has a statistically insignificant impact on board monitoring efficiency.

Finally, the last question raised in the chapter is to analyse how a bank directorship effects the CEO director's parent company long-run performance. The grounds of the notion that the appointment on the bank board may affect the CEO parent company performance stems from the view that bank directorships are valuable for outside CEOs as they help to establish a network within the banking sector which leads to access to external

funding that is, bank loans. Based on these studies an empirical investigation has been carried to examine; if there is any change in bank loans, profitability, and the risk management, measured as a tail risk, of CEOs' director parent companies in the post-appointment era.

The results on the long run performance of the CEO parent company reveal an increase in bank debt, and a profitability measure of both financial and non-financial firms. The larger increase is, however, observed in the bank loans of non-financial firms. Nevertheless, an increase in tail risk only materialises in the case of non-financial firms.

Overall, the findings in this chapter reveal various aspects of bank board dynamics and the impact of directors' specific characteristics on the monitoring and advising quality of bank board. In addition, findings on CEO parent company investors' reaction and change in bank debt provide an interesting insight into the value of bank directorships and the incentives attached to sitting on a bank board. In a nutshell, the results from the analysis of the outside CEO appointment on bank boards reveal that the determinants of appointments critically depend on the appointing banks' business model and whether the outside CEO is managing a financial or a non-financial firm. In addition, findings suggest that irrespective of directors' managerial skills, investors only react positively when an appointed director possesses financial experience. The further analysis of the post-appointment effects on the bank business model, performance, and risk also exhibit significant heterogeneity between the two categories of outside CEO directors. In summary, these results provide clear evidence that the matching between boards and directors is significantly influenced by the business model of the bank and the industry of the appointed CEO director.

This chapter offers several contributions to the literature. First, it contributes to the literature on directors-board matching in banking by presenting the first analysis on independent director appointments in the banking firms. Existing studies have merely

focused on the short-term value effects of the appointment of executive directors (Nguyen et al., 2015). More generally, current study is related to the literature on the nexus between bank board composition, performance and risk-taking (see, for instance, Adams and Mehran, 2012; Berger et al, 2014; Minton et al., 2014) that is primarily based on the structural characteristics of bank boards and not on director appointments.

Second, the chapter extends and complements the existing limited number of studies on outside CEOs on corporate boards (Fahlenbrach et al., 2010; Faleye, 2011; Fich, 2005) by demonstrating the importance of the industry where CEOs come from and the business model of the bank in understanding the drivers of their appointment onto bank boards and the related effects for the appointing bank and the outside CEO firm. Third, by examining the short and long run post appointment effects of directors on the bank business model, performance and risk measures it adds to the on-going debate on identifying director specific characteristics that may improve the efficiency of bank governance(see, for instance, Adams and Mehran, 2012; Berger et al., 2014; Minton et al., 2014). Fourth, it contributes to the literature on how investors and directors value directorships based on the incentives associated with them (Perry and Peyer, 2005). Finally, the analysis extends the growing management and finance literature that sees the industry expertise of a director as an important component of his/her human and social capital (Carpenter et al., 2001; Kor and Sundaramurthy, 2009) and in particular studies on the role of industry expertise and directors skill set in related industries (Adams et al., 2018; Dass et al., 2014;).

1.2.2 A Bank's Capital Management Under Different Board Structures and the Importance of Regulatory Scrutiny

Since the 2008 global crisis capital structure and corporate governance are two widely researched areas in the banking literature. The integral role of bank capital in managing risk and providing protection against systemic shocks increases the importance of understanding its dynamics (see, for instance, Gropp et al., 2010; Berger et al., 2013). Similarly, corporate governance has become an integral factor for a stable financial system since scholars have attributed weak governance arrangements as an important determinant of the 2008 financial crisis (Kirkpatrick, 2009). While the importance of these two domains in enhancing the financial stability of banks remains clear, nevertheless, the extant literature does not document any concrete evidence on the interplay between these two critical strands.

This empirical chapter aims to investigate the influence of the corporate board structure on the dynamics of the bank's capital. In particular this chapter adds to the literature on banks' capital by answering two questions; first, what impact does the structure of bank boards have on the bank capital management? Second, does regulatory scrutiny change the degree of the nexus between the structure of the corporate board and bank capital? The first question adds to the three different but related streams of the literature on banks' capital management: first, the determinants of the target capital ratio, second, the rate of adjustment towards target capital, and third, the source of adjustment banks use to achieve target capital ratio. While the second question adds to the literature on the effectiveness of corporate governance in regulated industries, more specifically it adds to the literature which states regulation complements corporate governance mechanisms (Hagendorff et al., 2010; Becher and Frye, 2011).

For the empirical analysis, the chapter focuses on two corporate board

characteristics that have recently attracted much regulatory attention: the degree of board independence and the proportion of independent directors with financial expertise. The selection of board independence is motivated by the recent banking literature which investigates the implication of board independence on bank performance and risk-taking (Anginer et al., 2016, 2018; Ellul et al., 2013; Vallascas et al., 2017) and claims a negative relationship between the two (Aebi et al., 2012; Faleye et al., 2017; Minton et al., 2010). While the notion behind examining the impact of financial expert independent directors stems from the widespread view that bank directors should possess adequate financial skills to perform their board duties in a more effective and efficient way (Adams, 2012; Kirkpatrick, 2009).

This chapter addresses four empirical questions:

The first question raised is how board independence and the proportion of independent directors with financial expertise influence the bank's target capital ratio. A data sample of 637 U.S. banks from 2001 to 2014 has been used for the analysis. The empirical analysis is based on a dynamic speed of adjustment framework, which is recently used by several studies (see, for instance, Berger et al., 2008, 2018; De Jonghe et al., 2015). In this setting, each individual bank has its own target capital level and the speed of adjustment towards this target. This model specifically accounts for the presence of heterogeneity in the rate of adjustment and target capital across banks based on their individual characteristics.

In the first step of the analysis the study investigates the impact of corporate board characteristics, that is, board independence and the proportion of financial expert independent directors on the target capital ratio. The analysis shows that board independence and the proportion of financial expert independent directors have a significant and negative impact on the target capital ratio. More specifically, the results are consistent

with the existing literature suggesting that shareholder-friendly boards prefer high leverage which might favour risk-shifting behaviour onto government safety nets and taxpayers (Anginer et al., 2016; Anginer et al., 2018; Pathan, 2009).

In the second step of the analysis, the study investigates the influence of board independence and the proportion of financial experts among independent directors on the speed of adjustment towards the target ratio. Importantly, to conduct this analysis I distinguish between undercapitalised and overcapitalised banks. This distinction is important because of two reasons. First, in a dynamic setting, explanations on the nexus between capital and governance based on the potential risk-shifting incentives of bank shareholders, as those in Anginer et al. (2016; 2018) for bank capital ratios, have to account for the degree of capitalization of a bank. In fact, as undercapitalized institutions are more prone to risk shifting (Hovakimian and Kane, 2000), if present, the incentives to shift risk should especially influence the capital adjustment process of these banks. Second, the distinction is also important from the regulatory perspective as regulators are more concerned about the adjustment made by undercapitalised banks which are potentially detrimental for financial stability as compared to banks which are overcapitalised.

The results from the second step show that more independent boards prefer to keep banks undercapitalised for longer durations, while in the conditions of overcapitalisation such directors make downward adjustment relatively fast. These findings are consistent with the extant literature claiming that banks with highly independent boards implement funding strategies that shift risk onto government safety nets and other stakeholders (Erkens et al., 2012; Vallascas et al., 2017). However, the results for the proportion of financial expert independent directors reveal that such directors prefer to quickly recover from the undercapitalization condition and prolong the conditions of overcapitalisation. These results

indicate that compared to other directors, financial expert independent directors are more aware of the potential costs associated with holding low capital. The results remain consistent when estimated using a 2SLS approach controlling for widely recognised endogeneity issues in the corporate governance literature.

In sum, the results from the first stage of the analysis reveal that independent and financial expert independent directors do not favour the interest of regulators as they prefer to keep the target capital low. The findings from the second stage of the analysis, however, reveal a different picture by exhibiting a significant difference between the speed of adjustment preferences of the independent and financial expert independent directors for under- overcapitalised banks. Indicating financial expert directors take more financially sound decisions while making an adjustment towards target capital especially in undercapitalized banks.

The second question raised is whether the observed differences in how the board structure variables impact the target capital and its speed of adjustment extend to the financing policies that banks implement to achieve the target capital ratio. The notion that bank financing policies may vary across degrees of board independence and financial expertise of independent directors emerges from the corporate governance literature suggesting shareholders favour retaining low capital and avoiding equity issuance to keep equity capital level low to prevent the dilution of ownership rights (La Porta et al., 2002; Lepetit et al., 2015).

The analysis accounts for adjustment strategies by considering changes in the numerator (equity and retained earning adjustment) and denominator (loan portfolio and securities adjustment) of the bank capital ratio. The results from this analysis show that financial expert independent directors are more likely to correct undercapitalisation

conditions by equity issuance along with a decrease in securities holdings. In contrast, independent directors opt for a decrease in retained earnings. However, when banks face overcapitalisation conditions independent directors make downward adjustment via equity repurchases and increases in lending. Contrarily, financial expert directors correct surplus conditions by decreasing retained earnings and increasing both lending and activity and securities.

The third question raised is how an increase in the degree of regulatory scrutiny influences the impact of board variables on the target capital ratio, the speed of adjustment and (re)financing choices. Independent directors are concerned about their reputation in the directors' labour market - thus external regulatory pressures may force them to align their actions with those of the regulators (Fahlenbrach et al., 2010; Masulis et al., 2014). Moreover, the extant literature claims that regulatory pressure on the regulated firms forces them to enhance the advising and monitoring quality of the board (Hagendorff et al., 2010; Becher and Frye, 2011). Consequently, independent directors may alter their attitude towards capital management, when they are subject to external regulatory pressure. I employ a unique measure to capture degree of regulatory scrutiny at the bank level called regulatory attention (see Hirtle et al., 2016) where the Dodd-Frank Act is used as an additional scrutiny measure to capture the impact of sector-level regulatory reforms on the influence of board structure measures on bank capital management.

The analysis shows that regulatory pressure alters the directors' attitude towards the target capital ratio. In response to the Dodd-Frank Act both independent directors and financial expert independent directors tend to increase the target capital ratio. Similarly, both financial expert independent directors and other independent directors respond by accelerating the adjustment process when banks are undercapitalised/overcapitalised. The

analysis of the second measure of regulatory scrutiny "regulatory attention" reveals similar findings suggesting an increase in target capital and the speed of adjustment irrespective of independent directors' expertise for both under and over capitalised banks. Additional analysis reveals that regulatory pressure (Dodd-Frank Act and the measure of regulatory attention) also shifts the financing choices which support the regulatory objectives, that is, equity financing.

Taken together, our findings provide insight into an important phenomenon of bank's capital dynamics, namely the role of corporate governance (especially board independence and financial expertise of independent directors) in determining the level of target capital and speed of adjustment, which has not been addressed in existing banking literature.

The current study contributes to three streams of research literature. First, the literature on bank capital and corporate governance which report an influence of corporate governance, especially, board independence, shareholders' rights, and ownership structure, on banks' capital structure decisions (see, Anginer et al., 2016; Molyneux and Chunxia Jiang, 2014; Lepetit et al., 2015). Second, corporate finance literature on a relationship between corporate governance and capital structure (see, Morellec et al., 2012; Chang et al., 2014). Third, the literature on the interplay between bank governance and regulation (see, Becher and Frye, 2011; Hagendorff et al., 2010).

The following key aspects make the present study different from above mentioned literature. First, the study provides a unique insight regarding the relationship between corporate board characteristics, namely board independence and independent directors' financial expertise, and bank capital adjustment process. Second, along with governance variables (board independence and financial expert independent directors) this study exploits

the level of bank capital with respect to its target capital as a source of asymmetry in capital ratio adjustment process. Third, it highlights the fact that regulatory scrutiny and directors' attitude towards capital adjustment process has a significant positive correlation. Differently from the previous studies that examine the complementary effect of bank regulation in the context of the market for corporate control (Hagendorff et al., 2010) and the use of corporate governance in a regulated industry (Becher and Frye, 2011), this study adds to this stream of literature by examining the complementary effect of regulation in the context of bank capital dynamics.

1.3 Structure of the thesis

The rest of the thesis is structured as follows. Chapter 2 offers an overview of the literature on corporate governance of the bank. The focus of this chapter is to analyse factors that differentiate bank governance from the corporate governance of non-financial (unregulated) firms. Moreover, it provides a comprehensive review of the literature regarding the impact of each type of governance mechanism on bank performance and risk-taking.

Chapter 3 studies the impact of CEO directors from financial and non-financial firms based on their working experience on various measures of bank performance and risk-taking. This chapter in particular focuses on the demand and supply side of CEO directors. From the demand side of CEO directors, it addresses the question of what determines the appointment of CEO directors managing financial and non-financial firms. While from the supply side it investigates the benefits the parent company of CEO directors gain once their CEOs sit on bank boards.

Chapter 4 employs a dynamic speed of adjustment framework to test the impact of corporate board structure on bank capital management processes. The purpose of this

chapter is to determine the role of board independence and financial expert independent directors on the bank's target capital ratio, speed of adjustment and (re)financing choice. Moreover, this chapter analyses how additional regulatory pressure influences the impact of corporate board structure on the dynamic of bank capital and the financing choice banks use to achieve the target capital ratio.

Finally, chapter 5 offers conclusions.

2 An Overview of Corporate Governance in Banking

2.1 Introduction

The aim of this chapter is to discuss in detail the concept of corporate governance and the mechanisms it offers to deal with the agency problems in the banking sector. It also offers a detailed discussion of the corporate governance issues which are specific to the governance of financial institutions - specifically, banks in the U.S.

Scholars have been studying corporate governance since the early 1930s (Berles and Means, 1932; Coase, 1937; Dodd, 1932), however the stream of events that took place in the last two decades, such as, emergence of complex corporations, an increase in privatisation around the global, and the corporate scandals that unfolded in the early 2000s, have reignited the debate among scholars and policymakers on the importance and effectiveness of current corporate governance mechanisms. In addition, the financial crisis of 2007 – 2009 has further renewed the interest of corporate governance scholars to examine the role of corporate governance mechanisms of financial institutions in initiating the global crisis (Kirkpatrick, 2009; Renee B. Adams, 2012)

This chapter reviews the extant literature available on corporate governance and the mechanisms it offers to evade the agency problem. Secondly, it reviews the corporate governance of financial institutions and discusses in detail the factors which make the governance of financial institution different from the corporate governance of non-financial firms.

The rest of the chapter is structured as follows. The next section sheds light on the importance of corporate governance in today's world and what factors make it an important topic to study. Section 2.3 discusses the special features embedded in the banking business

which impair the standard corporate governance structures/policies. Sections 2.4 offers detailed discussion on corporate boards, and characteristics. Section 2.5 provides details on the other mechanisms of corporate governance and reviews the advantages and potential short-coming of each type of corporate governance mechanisms offers to control agency problems. Section 2.6 reviews the implications of bank governance on bank capital. Section 2.7 discusses the implication of regulations on banking governance. Finally, section 2.8 concludes the chapter.

2.2 Why Corporate Governance Has Gained So Much Attention

In today's markets corporate governance is of enormous practical importance. The role corporate governance plays in formalizing the functions to be performed by various actors within a corporation make it an important area in the mainstream finance literature. Corporate governance is a varied field that deals with issues related to monitoring and advising managers, ownership control, the board of directors, and executive compensation.

It is a valid question to ask what has made corporate governance such an important topic over the past three decades among academic scholars, regulators, and governments. Becht et al. (2003) identify six main reasons for the prominence of corporate governance in today's corporate world. i. Increase in privatisation around the world, ii. Pension fund reform and an increase in private savings, iii. A surge in takeovers during 1980s (Shleifer and Vishny, 1988), iv. Deregulation, v. The 1998 East Asia crisis, which highlights the importance of corporate governance in emerging markets, vi. A succession of corporate scandals and failures in the U.S.

In a similar context, Yoshikawa and Phan (2001) report that globalisation and rapid technological advancements result in thin profit margins which force firms to increase their

profit maximization through the efficient utilization of assets. They argue that shrinking profits required corporations to use stringent monitoring mechanisms to increase shareholder value by preventing managers from expropriating their wealth.

From the perspective of the corporate governance of banks, weak corporate governance arrangements are identified as an important determinant of the global financial crisis (Kirkpatrick, 2009). Thus, the financial crisis of 2007 – 2009 played an important role in reigniting the debate on the role corporate governance can play in providing financial stability in the banking sector. In the aftermath of the financial crisis several countries have introduced corporate governance codes of conduct for banks. For instance, The UK government commissioned Sir David Walker to propose measures to improve the internal corporate governance of banks. The report serves as the basis for the 2012 U.K. Governance Code (Walker and Walker, 2009). In the United States, regulators introduced the Dodd-Frank Act which specifically targeted the board level governance mechanisms of large banks, containing several guidelines regarding the skills and knowledge of the directors and the requirement for the establishment of risk committees (Dodd-Frank Act, 2010). Moreover, two additional factors which are specific to banks further incite research on the corporate governance of banks. First, the special nature of bank business which requires a better understanding of the implications of the existing governance mechanisms on the bank's performance (Adams, 2011; Kirkpatrick, 2009). Second, unlike non-bank firms, where corporate governance mechanisms are largely designed to focus on shareholders' value maximization, financial institutions in addition to conflicts of interests between managers and shareholders suffer from conflicts of interests between shareholders and depositors which make the agency theory more complex. Therefore, corporate governance research on non-financial firms has limited generalisability to research on the corporate governance of banks (Laeven, 2013)

2.3 Corporate Governance of Banks: Where is the Difference?

Banks are the backbone of any modern economy as they play an integral role in economic growth and mobilising funds. The global financial crisis has demonstrated the extent to which the failure of banks has devastating effects on the wider economy. Scholars have explicitly attributed corporate governance as one of the major causes of the financial crisis of 2007 – 2008 (Kirkpatrick, 2009). Recent, academic and regulatory debate targets the interaction between bank sector specific characteristics and various aspects of banks performance and risk taking with an aim to improve the stability and sustainability of financial institutions.

One important question, raised by corporate governance and banking scholars, is: what role does corporate governance play in achieving financial stability in banks? The answer to this question is not straightforward as the identification of a relationship between governance and bank failures is difficult due to the interaction of bank specificities (such as impact of leverage, government safety nets, opacity of banks business nature) with the corporate governance framework.

The literature on bank governance claims that the special nature of the business of bank influences the efficiency and effectiveness of the standard governance policies. In this regard, a large number of studies on bank governance has identified various bank-specific characteristics which can potentially impair the effectiveness of the standard corporate governance policies (Abhishek and Jens, 2015; Adams and Mehran, 2003; Levine, 2004; Laeven, 2013). These special features of bank business include; a) capital structure of banks (funding through deposits and high leverage), b) the complexity and opacity of their business and structure, and c) government safety nets (deposit insurance).

This section aims to review the extant literature on an interaction between bank specificities and corporate governance framework.

2.3.1 High Leverage

To device an optimal corporate governance framework for banks it is important to distinguish and value the interests of both shareholders and external stakeholders (which includes creditors, tax-payers, governments, and regulators). The major difference between the corporate governance of banks and non-bank firms is that governance policies for non-bank firms are centred on the agency-theory framework where conflicts of interests arises between risk averse managers and value-maximizing shareholders (Jensen and Meckling, 1976). In agency framework governance policies are primarily designed to protect and promote the interests of the shareholders (Smith and Stulz, 1985; Weisbach, 1988).

Unlike non-bank firms which only consider the agency problem from the shareholders-managers perspective, banks face additional agency conflicts arising from wider stakeholders namely, depositors and tax-payers. This additional conflict of interests arises due to the core nature of banks capital structure, that is, high leverage. It is normal for banks to have 90% (or above) leverage ratio as they are mostly capitalised by funds from the depositors and bondholders (Adams and Mehran, 2003; Macey et al., 2003). Nevertheless, most of a bank's strategic decisions are taken by the managers, shareholders and board of directors. This separation of financiers/stakeholders (depositors, tax-payers) and decision makers in banking organisations complicates the standard agency theory.

Like shareholders of any other corporation, bank equity owners have wealth maximizing interests which may significantly differ from those of the depositors. Bank depositors receive fixed return, while shareholders returns are directly proportional to the bank risk thus they provoke management to undertake risky projects. However, if a project

fails a major part of the cost will be borne by the depositors as shareholders are protected under limited liability. Thus, bank shareholders have high incentives to take excessive risk while shifting them to bank depositors in the case of failure.

This risk-shifting problem in banking is widely recognised. For instance, studies have shown that in the case of banks if managers' interests are perfectly aligned with those of shareholders it provokes them to take higher risk at the expense of the creditors (Anginer et al., 2016; Anginer et al., 2018; Adams, 2012; John et al., 2010; Laeven, 2013; Srivastav et al., 2014; Vallascas et al., 2014). The aforementioned studies have theoretically shown that shareholders have less incentives attached to prevent banks from taking excessive risk in order to take advantage of government guarantees and less informed/dispersed stakeholders. In a similar domain in their study (John and Qian, 2003) argue that in highly leveraged firms (e.g. banks), if managers have a high proportion of high equity based compensation they will have strong incentive to take risky investments. Thus, standard governance tools i.e. equity based compensation managerial compensation that align shareholders and managers interests increases the conflicts of interests between shareholders and depositors.

To overcome the risk-shifting problem in banking scholars and policy makers have suggested a tailored corporate governance framework for banks that explicitly protect the interest of both the shareholders and external stakeholders (Adams and Mehran, 2003; Macey et al., 2003; Berger et al., 2014; Bhagat et al., 2015). This group of studies have established that banks which take higher risk are subject to higher interest rates in the interbank borrowing market (Furfine, 2001; King, 2008) and subordinate debt market (Flannery and Sorescu, 1996). Another group of studies examines the role depositors in controlling the risk taking in banks by demanding higher interest rates on their deposits (see

(Martinez Peria and Schmukler, 2001; Berger and Turk-Ariss, 2015). (Abhishek and Jens, 2015) show that internal governance mechanisms such as executive pay structure is likely to be more effective in balancing the interests of shareholders and external stakeholders. It is also proposed that shareholder-depositor conflicts can also be resolved by passive monitoring techniques (e.g. third party monitors) which represent the interest of depositors and discourage the risk-shifting attitude of shareholders (Adams and Ferreira, 2012; Becher and Frye, 2011) . A third party could be regulators who act on behalf of depositors and wider stakeholders that is taxpayers, by enacting regulations to restrict banks from excessive risk-taking.

2.3.2 Opacity and Complexity of the Banking Business

Another feature that makes bank governance different from non-bank firms is the opacity and complexity of the bank business model which exacerbate the problem of information asymmetry. Primarily, banks are involved in lending business. They generate revenue by accepting deposits and transform them into loans.[2] Banks have an information advantage as they can privately monitor the quality of their loan portfolio. The banking scholars have argued that this information asymmetry makes it difficult for the external stakeholders to observe the quality of bank assets' directly or immediately thus leave them unaware of the true extent of risk hidden in bank activities and allow managers to purse a risky strategy without the consent of the external stakeholders (Diamond, 1984; Diamond, 1989; Mehran et al., 2011; Laeven, 2013).

[2] Deposits are liquid as they could be short-term. Where, loans are considered as long-term and illiquid.

Additionally, the core nature of bank business allows it to quickly change the composition of risk, that is, banks can take and/or off-load risky assets swiftly. These scenarios increase the information asymmetry between managers, the board of directors, and external stakeholders which include, shareholders and debtholders (Levine, 2004; Cohen et al., 2008). Recent research aims to bridge the gap on the nexus between information asymmetry arising from weak corporate governance arrangements and bank risk taking. For instance, (DeAngelo and Stulz, 2015; De Haan and Vlahu, 2016) study the interaction between risk management framework and corporate governance policies. They argue that corporate governance plays an important role in helping managers to fulfil the interests of both the shareholders and the creditors/tax-payers however the optimal risk taking is subject to the placement of an effective risk management framework. A group of corporate governance scholars suggest that, banks require directors with specific expertise and appropriate knowledge about complex trading activities to spot the potential risk and design an optimal risk framework that benefits the shareholders as well as the wider stakeholders of the bank (Andres and Vallelado, 2008; Adams, 2012; Ciancanelli et al., 2000).

2.3.3 Deposit Insurance

The collapse of a financial institutions can be costly due to their systematic importance in the economy. Consequently, large *too-big-to-fail* banks are de facto protected by government guarantees and bailout programs. Government guarantees act as a put option whose value increases with an increase in bank risk. Therefore, government guarantees encourage banks to increase the value of the put option by investing in high-risk projects which increases the overall risk of the bank. In this regard, the extant literature has shown that government guarantees, have a positive relationship with bank risk exposure (Gropp et al., 2014). Another feature unique to banks that exacerbates risk-taking in banks is deposit

insurance. This feature act as depositor's insurance and is designed to keep the agency cost of debt low and most importantly to avoid bank runs during panic situations.[3] One of the drawbacks of deposit insurance is that it reduces the incentive of depositors to monitor bank risk which lead to excessive risk taking. Moreover, deposit insurance also increase moral hazard problem by motivating shareholders and bank managers to pursue risky strategies (Becht et al., 2011; Laeven 2013). Consequently, bank corporate governance policies should be framed in a way that account for such bank specificities. For instance, bank should hire independent directors that not only represent the interests of shareholders but also safeguard the interests of the wider stakeholders, that is, depositors and taxpayers (Acharya and Richardson, 2009).

In sum, all these bank-specific issues make the governance of banks complex and require custom-made governance structures and policies that account for governance issues related to banks. Rest of the sections of this chapter discuss in detail how governance mechanisms differ in the context of the banking sector.

2.4 Corporate Governance Mechanisms

This section aims to shed light on corporate governance mechanisms in more detail and assess to what extent they are different for banks. This section takes the corporate governance literature on non-financial firms and the management literature to highlight the

[3] Depositors are generally dispersed and have no interest in monitoring the banks risk taking behaviour because of high information asymmetry and huge costs (Demirgüç-Kunt and Detragiache, 2002). This indifferent behaviour of depositors is the result of government safety nets which is an insurance policy for depositors in case of bank failure.

difference in the effectiveness of each governance measures in banks and non-financial firms.

2.4.1 Corporate Board of Directors

This section aims to discuss in detail one of the most important components of the internal corporate governance mechanisms, which is the Board of Directors. The board of directors can be defined as a group of skilled individuals – who do not have any direct interests associated with the corporation. Directors are elected by shareholders to monitor executives and oversee the activities and performance of the corporation on behalf of dispersed shareholders. The power and duties of the board of directors are heterogeneous across corporations and countries of incorporation as they are determined by both firm level and country level corporate governance laws and legislation. For instance, at the country level, government regulations specify the elementary criteria for directors' selection and their duties. For instance, in the case of regulated industries, e.g. banks, supervisors outline the eligibility criteria for the bank directors (directors' education, financial knowledge and skills etc.). While at the firm level the internal corporate governance structure of the firm allocates the roles and duties to each director based on their experience and expertise, which includes the chairman of the board or the chairman of a particular committee e.g. compensation committee, audit committee etc.

The board of directors consists of two types of directors namely; executive directors, and non-executive directors. Executive directors (also known as *Inside Directors*) are those who are employees of the corporation or have any personal benefit attached to the firm. For instance, the Chief Executive Officer (CEO), and the Chief Financial Officer (CFO). Inside directors sit on the board as they are directly involved in the operations of the firm and have special knowledge about the inner-working, market position and potential growth

opportunities available to the firm. Non-Executive Directors (also known as *Independent Directors)* are those who are neither an employee of the firm nor do they have any business connections or personal benefits associated with the firm. Rather, shareholders elect them solely for the purpose of representing the interests of dispersed shareholders on the board. Apart from monitoring and protecting shareholders' interests on the board, one key aspect of hiring outside directors is that they bring a variety of expertise and outside knowledge to the board which can prove to be beneficial for firm performance.

2.4.2 Features of Corporate Boards

This section aims to discuss the characteristics of corporate boards, which include, board composition, power distribution, and diversity. In the corporate governance literature, the impact of various features of the corporate board on firm performance and overall board quality has been studied extensively. The following sections will review the literature on each feature.

2.4.2.1 Board Independence/Outside Directors

Board independence is an important internal corporate governance mechanism that is believed to increase the monitoring and advising quality of corporate boards. In response to the corporate scandals and frauds that unfolded in 2002, regulators introduced the Sarbanes Oxley Act (SOX) with an aim to improving the efficiency of corporate governance mechanisms and to restore the confidence of investors in the equity market. Among several rules that the Sarbanes Oxley Act 2002 imposed on listed firms in the U.S., it required corporations to increase board independence, that is, more than fifty percent of directors on the board should be outsiders and directors serving on various corporate board committees such as the audit, remuneration, and nomination committees should be completely independent. Banks are heavily regulated organisations. Therefore, their board composition

is largely determined by country level policies and regulations (Ferreira, Ferreira, and Mariano, 2012). Since the introduction of the SOX Act 2002 board independence of the US banking sector has hovered around 75% - 80%.

The role of independent directors is to ensure shareholders' wealth maximization. However, unlike non-financial firms, in the banking industry the fiduciary duties of independent directors are not limited to shareholder value maximization; rather bank directors are responsible for safeguarding the interests of wider stakeholders - most importantly uninsured depositors and governments (Macey and Hara, 2016; Macey, Maureen, and Macey, and H'Hara, 2003). Therefore, bank board independence cannot be seen just from the perspective of agency conflicts between shareholders and managers as it is in non-financial firms.

One of the widely researched questions in the governance literature is whether board independence has any impact on bank performance and risk-taking. In this regard governance scholars have studied the efficiency of independent boards in different governance settings to examine how well they contribute to the overall performance of the bank (Adams and Mehran, 2012; Aebi et al., 2012; Hagendorff et al., 2010; Pathan and Faff, 2013; Pathan and Skully, 2010; Vallascas, Mollah, and Keasey, 2017). Despite being extensively researched, studies do not reach a consensus regarding the direction of the impact of board independence on bank performance and risk-taking.

Erkens et al. (2012) study the influence of board independence on the stock market returns of 296 banks in 30 countries during the global financial crisis era 2007 – 2008. Their analysis shows that banks with highly independent boards experienced worse stock returns during the financial crisis. Moreover, they claim that such banks encountered larger losses because they took an extensive risk in the pre-crisis era. Beltratti and Stulz (2012) reach the

same conclusion when they analyse a sample of 1648 financial institutions to examine the bank risk attitudes during the financial crisis in relation to board independence.

In contrast, there are studies which claim a mixed relationship between board independence and bank risk and performance. For instance, using a sample of 212 large bank holding companies in the US over the 1997 – 2004 period, Pathan (2009) studied the influence of board composition on bank performance and risk-taking. His analysis shows that banks with more independent boards (measured as the percentage of independent directors on bank boards) take less risk as they find that board independence has a negative and statistically significant relationship with all measures of bank risk. He attributed the negative relationship to the well-balanced role of independent directors in safeguarding the interests of both shareholders and depositors. Similarly, Minton et al. (2014) report a negative relationship between board independence and several measures of bank risk in the post and pre-financial crisis era. Cornett et al. (2010) analyse a sample of 300 publicly traded banks to examine the relationship between bank performance and several corporate governance measures and find that during the financial crisis banks with highly independent boards outperformed their counterparts. In contrast to these authors, Aebi et al. (2012) report a negative impact of board independence on bank performance during the financial crisis era. They claim that the negative relationship indicates that independent directors provoke bank management to take excessive risk in the pre-crisis era with an intention to maximize shareholder wealth.

Adams and Mehran (2012) investigate the relationship between board structure and bank performance for data spanning around four decades. They find no statistically significant relationship between board independence and bank performance measured by a proxy for Tobin's Q. Anginer et al. (2016) use a sample of international banks over the

period 2003 – 2011 to study the impact of various measures of corporate governance on regulatory capital ratios. Their analysis shows that banks with shareholder-friendly governance structures are more likely to hold less capital compared to their counterparts. However, the coefficient on their board independence variable is negative and insignificant.

A few scholars claim that the impact of board independence on bank performance and risk-taking is, however, determined by various factors such as government bailout programs, independent directors' skills, etc. For instance, Vallascas et al. (2017) use a cross-country sample of 500 of the largest listed banks and BHCs to examine the influence of board independence on bank risk exposure in the post-global crisis era. They document that board independence has a negative impact on bank risk-taking in the post-crisis era. However, they conclude that, in general, board independence does not help the bank to be involved in risky business, rather the negative relationship between board independence and bank risk only materializes for those banks which are bailed out by governments during the crisis era.

Fernandes and Fich, (2012) on the other hand report that independent directors with longer tenures are the most valuable directors as they have extensive knowledge about the financial position of the bank. They examine the performance and risk exposure of 479 US banks and BHCs around the global financial crisis era in accordance with the board composition. They find that banks with independent directors with longer tenure limit their risk exposure before the crisis experience better stock returns, and outperform during the crisis era.

The mixed findings from the above review of the literature suggest that the more appropriate approach is to account for the director specific characteristics that is independent directors' skills and expertise, and corporate board structure measures while

estimating the impact of board independence on bank performance. As the board independence ratio, in general, produces inconclusive results.

2.4.2.2 CEO Power (CEO Chairman Duality)

CEO duality – is the case when the CEO of the firm also acts as the chairman of the corporate board. An extensive literature studies the influence of CEO duality on-board monitoring and advising quality as well as the overall performance of the firm. The literature on agency theory highlights both the negative and positive aspects of having the CEO as chairman of the board. The negative aspects include; CEO duality impairs directors' monitoring and advising quality due to the excessive power of the CEO (Jensen and Meckling, 1976). Moreover, the dual role of the CEO gives him an edge over the selection of the board of directors. Consequently, under such circumstances, it is more likely that the CEO appoints directors who are in his network to gain personal benefits (Larcker et al., 2005; Coles et al., 2014). CEO duality also has a potential to exacerbate the issue of information asymmetry between the board of directors and the CEO (Rutherford and Buchholtz, 2007). While the positive aspect of having the CEO as the board chairman is that due to the wealth concentration of the CEO of their employment they take a risk-averse approach in order to safeguard their jobs and positions. Given this, if a risk-averse CEO becomes board chairman he will have greater control over directing the board towards risk-averse strategies which clearly enhances stability. In addition, the dual role of CEO could potentially mitigate the conflicts between management and the outside directors which results in a positive impact on firm performance (Stoeberl and Sherony, 1985)

The governance literature on the relationship between bank risk taking (and performance) and CEO duality, however, reports inconsistent results. For instance, Pathan (2009) reports a negative relationship between bank risk taking and CEO duality. The

coefficient on CEO duality for all measures of risk turns out to be negative and statistically significant. They claim that CEO wealth and human capital is largely concentrated in the bank of their employment and thus they avoid taking an excessive risk which results in a bank failure. Similarly, Anginer et al. (2016) study the influence of CEO-chairman role separation on accounting-based bank capital levels. They use an index called *CEO-Chairman Separation* which ranges between 1 and 3 where a higher value suggests better separation. They find that banks, where the CEO has a dual role (chairman of the board), are more likely to hold more capital than their counterparts. They use a similar argument as of Pathan (2009) to justify the low risk-taking in banks where CEO has more control over the board strategic decisions. Berger et al. (2016) use a sample of US and international banks to examine the impact of various governance variables on bank performance during the financial crisis of 2007 – 2008. They report that when the CEO chairs the board they reduce the probability of default two years prior to default. However, they document that CEO compensation had a positive relationship with the probability of bank default. Similarly, Simpson and Gleason (1999) use a sample of 287 banks over the period 1989 – 1993 to analyse the role of corporate governance in a bank failure. They report that CEO duality significantly decreases the probability of bank default.

In contrast, the literature also documents a negative impact of CEO duality on bank performance. For instance, Grove et al. (2011) conduct an empirical analysis on a sample of 236 US commercial banks over the period 2005 -2008 to understand the role of corporate governance mechanisms on banks' performance during the global financial crisis. They find a negative relationship between CEO duality and bank performance; however, CEO duality does not have a negative impact on bank loan quality. While Vallascas et al. (2017) state that unlike board independence, CEO duality has no significant impact on banks shifting risk onto debtholders. Similarly, Aebi et al. (2012) report that in their sample of 372 US banks

CEO duality has no effect on buy and hold returns during the crisis period. Philip et al. (2011) take a different perspective by claiming that the impact of CEO duality on bank performance and risk measures should be examined jointly with other governance mechanisms. In their regression analysis, they interact CEO duality with an audit committee dummy variable (which takes the value of one if the audit committee is present and zero otherwise) and board independence. Based on a sample of U.K. based life insurance companies their analysis shows that CEO duality does affect profitability. However, they show that CEO duality has a positive impact on the profitability in the absence of an audit committee and a higher degree of board independence.

Other studies argue that CEO duality has a positive impact on bank stability as CEOs shows a risk-averse attitude and their ability to decrease the probability of bank default indicates that CEO duality is, in fact a, benefit that reduces the conflicts of interest between shareholders and debtholders (Berger et al., 2016).

2.4.2.3 Board Size

Board size – the total number of directors on a corporate board, is an extensively researched corporate governance mechanism. Despite the extensive literature, there is no conclusive evidence available on the direction of the impact of board size on firm performance, and on the monitoring and the advising quality of the board of directors.

A significant number of studies on bank corporate governance mechanisms compare and contrast the board size of financial firms with those of non-financial firms. Studies in this group report that the boards of US Bank Holding Companies (BHCs) and commercial banks are bigger than non-financial firms (Adams and Mehran, 2003; Adams, 2012). The difference in board size between financial and non-financial firms is not only observed in the US banking sector, rather it extends to banks in the international markets (Andres and

Vallelado, 2008). A few factors provide a valid justification for the difference in the board size. First, it is a widely held view that board size is positively correlated with firm size, and banks are larger than non-financial firms in terms of total assets and consequently, they have bigger boards (Coles et al., 2008; Graham et al., 2011). Second, a possible explanation of banks having bigger boards is the opacity and complexity of banking organisation which requires more board committees and directors with diverse skills to overlook the strategy development (Adams and Mehran, 2012). However, studies on the evolution of corporate boards show that bank boards are shrinking over time (Adams and Mehran, 2012).

Another research question that scholars ask is how board size affects bank performance, and the monitoring/advising quality of the directors. The research literature highlights both the pros and cons of bigger boards. The resource dependence view suggests that bigger boards include more directors with a diverse skill set, thus they are more effective in devising and monitoring the corporate policies of big and complex organisations, such as banks (Raheja, 2005; Boone et al., 2007). In contrast, scholars also claim that big boards suffer from a free-riding problem among directors which decreases the monitoring and advising quality of the board and increases both the cost of monitoring and decision-making time (Jensen, 1993). Moreover, having a large number of directors on a board also increases the probability of conflicts among directors which may leave the firm directionless and consequently, deteriorate the firm performance (Eisenberg et al., 1998).

In contrast to the studies on non-financial firms, the bank governance literature on the relationship between board size and firm performance mainly suggests that due to the complex and opaque nature of bank business, bigger boards are better for banking (Adams and Mehran, 2012) organisations. Scholars have identified a positive impact of board size on various measures of bank performance (i.e. Tobin's q, Return on Assets (ROA), Return on

Equity (ROE)). Adams and Mehran (2012) examine the relationship between corporate board structure and bank performance using a sample of randomly selected 35 large U.S. banks over the period 1986 – 1999. They report a positive correlation between board size (and the logarithm of board size) and bank performance (measured as Tobin's q). They claim in large banks that the free-riding cost associated with bigger boards does not seem to outweigh the beneficial effects, that is, advising and monitoring, of large boards in BHCs. However, their results (for log board size) indicate that the beneficial effect of a large board decreases as the board gets larger in size. A similar positive relationship between board size and bank performance (measured as buy-and-hold returns and Return on Equity) is reported by Aebi et al. (2012) for the sample of 372 US banks during the financial crisis period (2007 – 2008).

Another group of studies report a negative and/or nonlinear relationship between board size and bank performance (and risk). Using a sample of financial firms in S&P's 1500 index over the period 1996 – 2010, Wang and Hsu (2013) examine the impact of various board characteristics on the operational risk of financial institutions. Their analysis shows that board size is negatively and nonlinearly related to the likelihood of the operational risk events of financial firms. They report that an incremental increase in board size after 14 board members increases the likelihood of operational risk events. Andres and Vallelado (2008) use cross-country data on 69 banks to find the optimal board size for banks. They reveal an inverted U -shape relationship between board size and bank performance. They report that an incremental increase in board size after 19 board members decreases bank value.

Interestingly, the literature regarding board size also examines its relationship with bank risk taking. Pathan (2009) uses a sample of 212 large US banks over the period 1997 –

2004 to examine the relationship between various components of board structure and bank risk-taking. They report that banks with smaller boards take more risk. Similar results are reported by Fernandes and Fich (2012) and Minton et al. (2010) regarding the influence of big boards on bank risk. Moreover, Adams (2012) for a sample of 89 banks reports that banks with bigger boards are more likely to receive TARP funding. Studying the relationship between lending quality and bank corporate governance, Faleye and Krishnan (2017) report that banks (sample of 51 banks over the period 1994 – 2006) with smaller boards are less likely to issue junk boards and underwrite speculative loans.

In contrast to the above-reviewed studies another group of studies report no significant relationship between board size and bank performance. For instance, Adams and Mehran (2008) report no significant effect of board size on bank performance. Similarly, Philip et al. (2011) also could not find a significant relationship between board size and bank performance (measured as profit efficiency).

2.4.2.4 Directors Financial Expertise

The literature on directors' advising quality shows that there exists a performance variation within different types of independent directors in the boardroom (Byrd and Mizruchi, 2005; Huang, 2014; White et al., 2014; Wang et al., 2015). Specifically, the appointment of the industry expert independent director not only increases advising and monitoring quality but also proves to be beneficial for overall firm performance (Fahlenbrach et al., 2011; Dass et al., 2014; Wang et al., 2015). For instance, Burak Güner et al. (2008) show that the appointment of a financial expert independent director improves non-financial firm performance, where the appointment of banking sector independent director decreases the cash flow sensitivity of the firm (Kroszner and Strahan, 2001).

In the context of the banking industry, however, there exists a limited number of studies which examine how financial expert independent directors influence bank performance and risk-taking. Moreover, the results from these studies are not conclusive. As one group of studies claim that the presence of financial expert independent directors on bank boards increases risk-taking (Aebi et al., 2012; Minton et al., 2014). While few studies report a negative or even no correlation between the financial expertise of independent directors and bank performance (Hau and Thum, 2009; Cunat and Garicano, 2010; Fernandes and Fich, 2012; Erkens et al., 2012)

Minton et al. (2014) employ a sample of US publicly traded banks with total assets greater than $1 billion over the global financial crisis period 2007 – 2008. Using this sample, they conduct an empirical analysis regarding the impact of having financial expert independent directors on bank performance and risk-taking post and during the financial crisis period. They define financial expert directors as those who; have current/past working experience in the banking and/or financial sector, hold financial positions in the non-financial sector, have financial qualifications, hold a finance related academic position (e.g. professor of finance, accounting or economics), and work as a professional investor (work in hedge fund, private equity). In their study they show that banks with financial expert directors on their boards were amongst the worst performers in terms of stock returns during the financial crisis. They claim that such banks took an extensive risk in the pre-financial crisis era which affected their performance during the crisis. Moreover, they show that there exists no significant relationship between the presence of financial expert directors on board and the likelihood of receiving TARP funds. They argue that directors with financial expertise hold specialised knowledge and skills which enable them to understand the complex business nature of banks and potential risk opportunities with high returns. Consequently, such independent directors favour shareholders' interests by investing in

high-risk high return investment to increases shareholders' wealth. Consistent with the findings of Minton et al. (2014), Aebi et al. (2012) report a negative impact of percentage of the financial expert directors (they define financial expert directors as those directors who have past or present experience as executives of banks or insurance companies) on buying and hold returns around the global financial crisis period.

In contrast, another group of scholars reports a negative correlation between financial expert directors and bank performance (and risk-taking). For instance, Fernandes and Fich (2012) use a sample of 398 US banks for the period 2007 – 2008 to examine how the financial expertise of directors on bank boards influence bank performance around the global financial crisis period. However, their definition of financial expert directors is unlike Minton et al. (2014). They define a director as a financial expert based on his/her tenure on the board. They claim that directors with a longer tenure on board is more likely to better understand the financial position of the bank which gives them an edge over other directors. Therefore, the presence of such directors on a board increases the advising and monitoring quality of the board. Their empirical analysis shows that the presence of financial expert directors on a board is positively related to bank performance during the crisis period and also decreases the number of bailout funds that banks received. Cuñat and Garicano (2010) use a sample of Spanish Cajas and report that banks in which the chairman had no financial education or past working experience performed worse during the financial crisis. Similarly, Hau and Thum (2009) conduct an empirical analysis on a sample of the 29 largest German banks and report that the absence of previous banking industry experience by board members led to worse losses during the global crisis of 2007 – 2008.

A potential explanation for the mixed results on board financial expertise and bank performance is that the above-reviewed studies use different criteria to define directors as

financial experts. For instance, Minton et al. (2014) classify a director as a financial expert based on their current and past financial position (experience) in banking/financial firms or non-financial firms. While Fernandes and Fich (2012) define financial expertise based on director tenure. Moreover, these studies provide results from different countries. These factors may contribute to the variation in results across these studies (De Haan and Vlahu, 2016).

2.5 Other Corporate Governance Mechanisms

This section aims to shed light on extended corporate governance mechanisms in more detail and assess to what extent they are different for banks. This section takes the support of corporate governance literature on non-financial firms and the management literature to highlight the difference in the effectiveness of each governance measure in banks and non-financial firms. The research literature has identified three major factors which cause a significant difference in the effectiveness of corporate governance mechanisms between banks and non-financial firms i. regulation, ii. bank capital structure, and iii. complexity and opacity of banks business nature (Laeven, 2013).

2.5.1 Incentive-based Compensation / Incentive Contracts

It was mentioned earlier that incomplete contracts, which give managers discretionary powers, are one of the major sources of agency problems. A contract between managers and shareholders cannot list all the possible actions expected from managers on every possible future eventuality, this incompleteness of the contract results in residual control rights. These rights are allocated to managers which give them enormous rights that they can exercise in their self-interest. Managers can exploit their discretionary power by investing in inefficient projects (pet-projects) for their own-benefits (Shleifer et al., 1997).

A potential solution corporate governance provides to prevent managers from using their discretionary power against shareholder interests is to design efficient incentive-based compensation contracts which are based on the managers' performance. A good example of such incentive-based contracts is the stock option-based compensation which gives managers high returns on investing in risky projects but also limits their downside risk exposure. These contracts are believed to align managers' and shareholders' interests by reducing managers' conservative/ risk-averse investment attitude.

However, using incentive-based compensation schemes in the banking sector is not very straightforward. From a regulatory perspective, one important concern about bank manager's compensation is that compensation schemes can potentially influence a bank's risk-taking and financial stability. Scholars and regulators have attributed bank manager's compensation schemes as a main contributing factor to the global financial crisis (Bebchuk and Spamann, 2010; Mehran et al., 2011). Therefore, in the banking sector, relying on incentive-based compensation is not very effective and efficient.

Compensation schemes which are based on achieving short-term performance goals are more likely to provoke managers to pursue risky investment activities that increase share prices and give managers huge returns (De Haan and Vlahu, 2016). It is well documented that stock-based compensation structures in the banking industry encourages managers to take excessive risk. In the case of banks which are highly leveraged organisations, when managers' compensation is tied to the performance of the bank (in the form of stock grants) it provokes them to take excessive risk at the expense of debtholders and also causes conflict of interest between managers and debtholder (Becht et al., 2012). Similarly, Peng et al., (2008) concluded that managers with option-based compensation structures are more likely to manipulate the short-term share price which leads to class action litigation. Moreover,

they also find that managers who hold stock options take advantage of insiders' information and off-load the securities before the price drops. John et al. (2010) use data on 143 Bank Holding Companies for the period 1993 – 2007 to analyse the bank CEO pay-performance sensitivity with respect to various aspects of bank performance measure, that is, banks subordinate debt ratings, BOPEC rating for the overall financial health of the bank (non-preforming loan ratio). They conclude that banks' CEO pay-performance sensitivity is negatively related to the leverage ratio and positively related to the degree of outsiders' monitoring which includes bank supervisory bodies and subordinated debt holders.

Moreover, in the banking sector CEO compensation that favours shareholders' interests is not always appreciated by the regulatory bodies as such compensation structures may not always be in the interest of stability and sustainability of the financial system (Bebchuk and Spamann, 2010). The literature supports this claim by showing that aligning the interests of shareholders and managers in the banking sector increases banks' risk exposure (Gropp and Köhler, 2010). There also exists some evidence of a positive relationship between the level of CEO compensation and bank risk exposure. For instance, Cheng et al. (2015) use financial firms' data from 1992 – 2008 and show a positive correlation between risk and CEO compensation. While, Bebchuk et al. (2010) document that during the 2000 – 2008 period it was the compensation structure of the top executives of Bear Stearns and Lehman that induced excessive risk-taking. Consistently, in a more recent study, Gande et al., (2017) also report a positive relationship between CEO equity-based compensation and bank risk-taking during the global financial crisis.

In contrast, some studies also report that the relationship between bank risk and CEO compensation is ambiguous and not statistically significant. Grove et al. (2011) use a sample of 236 US banks and found a mixed relationship between CEO compensation and

bank performance. In particular, they report that executive compensation has a positive (negative) relation with short-term (long-term) bank performance.

2.5.2 Legal Protection

Legal protection comes under the external component of corporate governance that provides financiers legal rights over their capital ownership in the firm. Legal protection is referred to the security provided to outside investors, whether by courts, government agencies, or market participants. In the past decade the regulatory aspect of corporate governance has gained increased attention which includes regulatory reforms that took place with an intent to improve corporate governance practices at country-level across public traded companies. The research literature shows that country-level legal protection provides an additional layer of corporate governance which proves to be useful in preventing agency problems between controlling shareholders and outside investors (Shleifer and Vishny, 1997). For instance, La Porta et al. (1999) studied the legal protection rights available to investors in 49 countries. They document that corporations in countries with stronger investors' rights and stringent corporate regulations have less concentrated ownership, enjoy better corporate governance, higher firm valuation and experience an efficient capital allocation across markets. Studying the influence of security laws and disclosure requirements on stock market development in 49 countries Porta et al. (2006) report that market forces alone are not sufficient for development of the stock markets - rather additional security laws such as mandatory disclosure and private enforcement through liability rules have proved to be an important determinant of stock market development. Consistently, Hail and Leuz (2006) document that firms in countries that provide better protection to investors which includes extensive disclosure requirements, stringent security laws and strict enforcement regulations are more likely to enjoy a significantly lower cost of

capital. The research literature overall shows a consensus on the positive impact of legal protection on corporate governance mechanisms.

Differently, from non-financial-firms, banks are subject to stringent external monitoring by regulatory agencies (for instance, in the US banks are subject to several regulatory bodies of which FED, FDIC, and SEC are the main regulatory bodies). The literature reports a positive impact of country-level regulations on bank performance and soundness of the financial system. For instance, Brewer et al. (2008) examine bank capital as a function of country-level regulatory policies, macroeconomic conditions and financial characteristics. They report that in addition to bank-specific characteristics, country-level characteristics and policy variables also have a significant impact on bank capital ratios. For instance, banks prefer to maintain higher capital if their home country does not have a large banking sector, and in countries which have stringent regulatory policies and better corporate governance arrangements.

In contrast to this, there is a large body of literature which claims that country-level legal protection such as deposit insurance provided by FDIC to bank depositors also lead banks to take excessive risk at the expense of tax-payers (Demirgüç-Kunt and Detragiache, 2002; R.Gropp and Heider, 2010; John, John, and Senbet, 1991).

Overall, the external monitoring mechanism offered by country-level legal protection systems and regulators help secure the interest of not only the shareholders but the wider stakeholders of the corporation. For instance, in the case of banking country level regulatory policies help improve the financial stability and sustainability of the financial system by preventing banks from being involved in excessive risk activities. But at the same time, the deposit insurance schemes may incite banks managers and shareholders to take excessive risk at the expense of tax-payers.

2.5.3 Ownership Concentration/Institutional Ownership

Ownership concentration is one of the corporate governance mechanisms that provide a direct way to align the interests of managers with those of shareholders. It alleviates issues related to dispersed ownership, which leads to agency problems, such as, information asymmetry which exists between managers and shareholders; it also gives opportunity and power to shareholders to closely monitor management while suppressing the issue of the conventional free-rider problem. Another benefit concentrated owners enjoy is the voting rights which they can use to pressure management for interest alignment (Shleifer and Vishny 1986). In the U.S., however, concentrated ownership is legally restricted (Roe 1994) but in some extreme cases ownership concentration can reach up to 51 per cent in which case shareholders have outright control of firms' strategic decision making and management.

In the banking industry, however, ownership structure is largely determined by country level legal protection laws. In a cross-country study, Caprio et al. (2007) show that in the US more than 90% of banks are widely held. In contrast, most banks in other countries, for example, Sweden, Austria, and the Netherlands are controlled by blockholders. Moreover, literature also reports that compared to the European banking sector, banks in the US have higher ownership concertation but are less likely to have large shareholders (Erkens et al. 2012). While, Adams and Mehran (2003) report that the ownership concentration in the US banking sector is, however, reportedly less than the non-financial sector.

The literature on the influence of concentrated ownership on bank performance (and risk-taking) is, however, controversial as it does not reach any consensus. There exists indirect evidence that institutional ownership does not oppose excessive risk-taking. For

instance, Beltratti and Stulz (2012) use a sample of 164 large banks (assets greater than $50 billion) operating in 32 countries to examine the determinants which play an important role in the bad performance of banks during the financial crisis of 2007 – 2008. The analysis reveals that banks with a greater percentage of institutional ownership earned higher returns in the pre-financial crisis era; however, such banks show worse performance during the crisis. Similarly, Erkens et al. (2012) study the performance of 296 US banks in the pre and post financial crisis era. They concluded that banks with greater institutional ownership performed worse during the financial crisis because such banks took an extensive risk in the pre-financial crisis era. The results from these studies are consistent with the theory which claims that because institutional owners have a high degree of control of firm management they may incite managers to take the excessive risk as shareholders enjoy limited downside risk at the expense of debtholders (Johnson et al., 2000).

Another group of studies report that the country level regulations and shareholder protection laws influence the impact of concentrated ownership on banks performance. Laeven and Levine (2009) report that concentrated ownership does not negatively affect the bank performance if they are operating in countries with better shareholder protection laws. Moreover, they also report that the impact of regulation on bank risk-taking is based on the degree of controlling shareholders. In particular, regulation plays little role in preventing banks from excessive risk-taking if the bank is mainly controlled by the shareholders. Using a cross-country sample of 500 commercial banks from 2005 – 2007, Shehzad et al. (2010) report that ownership concentration reduces non-performing loans conditional on the supervisory control and bank regulations. They also report that given the level of shareholder protection, ownership concentration also improves the bank capital adequacy ratio.

Another type of ownership that has gained much attention in banking literature is the equity owned by the insiders, that is, executives and directors of the banks. The degree of insider ownership in the banking industry is important from the regulatory perspective as if insiders own extensive equity they may act more like owners than agents, that is, their interests will get aligned with those of shareholders. This scenario does not suit banks as it worsens the conflicts of interest between shareholders and depositors. To alleviate this problem regulators step in and place certain restrictions on the degree of insider ownership (Cornett, McNutt, and Tehranian, 2009). For instance, Adams and Mehran (2003) report that equity ownership by insiders (executives) in the banking sector is less compared to non-financial firms. Booth et al. (2002) report similar findings and suggest that the difference in the equity ownership of executives in the banking and the non-financial sectors is due to the regulation and difference in investment opportunities.

The findings on the relationship between insider ownership and bank performance are diverse. On the one hand, studies show that owning large amounts of equity by insiders reduces bank risk exposure and increases bank value as it equally benefits the managers. A group of studies report a negative impact of insider ownership and bank risk taking (see, Aebi et al., 2012; Chen et al., 1998; Lee, 2002). In contrast, a research literature also criticizes insiders ownership. Berger et al. (2012) report that greater ownership by managers, other than the CEO, increases the probability of default risk. While Fahlenbrach and Stulz (2011) document that banks that provided greater incentives to their CEOs performed worse during the crisis period.

Although literature criticises insider owners by claiming that they might take an informational advantage and be involved in speculative trade because they are able to off-load shares in highly liquid secondary markets close to crisis periods. Nevertheless, the

banking literature does not show a sign of share off-loading by the CEOs in the pre-crisis era which suggests that CEOs were not aware of the oncoming crisis (Fahlenbrach and Stulz 2011). These contradictory studies weaken the argument of strong monitoring in the presence of large shareholders.

2.5.4 Hostile Takeovers/ Market for Corporate Control

Hostile takeovers (Market for Corporate Control) are considered as an external corporate governance mechanism. It was introduced as an alternative to shareholder activism by some commentators in 1960s with an assumption that it might be a more effective way to reduce managerial entrenchment (Becht et al. 2012). Although hostile takeovers are very rare and costly, they are, however, believed to be an effective measure in countries where large shareholders are less common, for instance, the United States and the United Kingdom. In a hostile takeover deal, the acquirer/bidder makes an offer to buy all or a certain percentage of a firm's outstanding shares at a tender price. The deal is successful if the bidder gains more than 50 per cent of the voting rights and hence gains effective control of the firm management. However, in extreme cases where bidder buys more than 50 per cent of the firm's outstanding shares, they get complete control of the firm and corporate board and, thereby the acquirer is able to replace the existing CEO. The intuition behind unfriendly takeovers is that unlike shareholders who have a diverse portfolios, managers' wealth, such as their human capital and equity incentives, is concentrated in a firm they are managing. Hence, managers want their firms to perform above a certain threshold to avoid giving potential acquirers (who believe that they can improve the firm performance if they take control of it and manage in a certain way) an opportunity for an unfriendly takeover. However, the modern corporate governance literature has sceptical views on the efficiency of hostile takeovers - one of the key reasons is that there has been a decline in

hostile takeover activities since 1989. Becht et al. (2003) suggest that top managers lobbying to get protection against unfriendly acquisitions is one of the reasons there has been a decline in hostile takeover activities.

In the banking sector, however a hostile takeovers are very rare due to several restrictions being placed by the supervisors from the regulatory and capital structure perspective (Prowse, 1997; Adams and Mehran, 2003). For instance, (Adams and Mehran, 2003) report a few major reasons for the absence of hostile takeovers in the banking industry. First, bank regulators place significant delays on takeover bids. These delays give target banks enough time to seek to guard against the takeover or find alternative bidders. Second, in hostile takeovers raider firms need large sums of cash for acquisition on very short notice. However, if the acquirer is a BHC, it needs to borrow a large amount of funds to acquire the target bank (as acquisitions are mostly cash-based and the successful bidder requires funds instantly to close the deal). Consequently, being already highly leveraged organisations, BHCs avoid borrowing huge amounts. Third, the large block ownership of holding companies reduces the probability of takeovers. Moreover, it is reported that in other countries, bank incumbent management gets indirect protection from the strict regulations regarding the entry requirements, takeovers and mergers which make hostile takeovers nearly impossible in the banking sector (Cheng, Gup, and Wall, 1989). Another potential reason for unsuccessful takeovers is that it offers the managers of the bidder firm an opportunity to increase their control rights and private benefits by taking over firms which are of interest or closely related to their human capital (Bliss, 2001). Another drawback of takeovers in the banking sector (which is disliked by the regulators) is that managers can exploit takeovers for personal benefits as it makes banks extremely large in size and gives them a too-big-to-fail status (Penas and Unal, 2004). Collectively, this makes bank

management entrenched which has negative consequences on bank performance in the post-acquisition era (Hughes et al., 2003).

However, there is some evidence available regarding a positive impact of hostile takeovers on the banking industry in the United States during the 1980s takeover wave (Berger et al., 1999). For instance, a recent study on bank mergers and acquisitions by DeYoung et al. (2009) reports that poor performing banks are most likely to be acquired. Consequently, they claim that the market for corporate control plays an effective role in cleansing the market by getting rid of poor performers. In contrast, Laeven (2013) reports that hostile takeovers are only successful in the United States and the United Kingdom as they do not exist in the rest of the world.

2.6 Banks Capital and Corporate Governance

The existing literature on bank capital focuses on two main streams of literature, that is, target capital and the speed of adjustment towards a target capital level. Studies on target capital examine the factors which determine the bank capital. For instance, Gropp and Heider (2010) examine the determinants of bank capital structure. They reveal that a bank regulatory capital requirement plays only a secondary role in the determination of bank capital structure. Bank capital is in fact determined by individual bank-specific characteristics which remain fixed during long periods of time. Consistently, Berger et al. (2008) report that large banks set target capital levels well above the regulatory minima and the target capital level increases with an increase in risk exposure but decreases with bank size. In sum, these studies claim that regulatory capital can only be considered as a secondary determinant of capital structure. While, Brewer et al. (2008) report that in addition to bank-specific characteristics, country-level characteristics and policy variables also have a significant impact on bank capital ratios. For instance, banks prefer to maintain high capital if their

home country does not have a large banking sector, and in countries which have stringent regulatory policies and better corporate governance arrangements. Similarly, Marcus (1983) documents that the declining trend in capital to asset ratio of banks in the U.S. between 1961 and 1978 is driven by a change in macroeconomic environment - specifically it is a response of profit-maximizing banks to an increase in the nominal interest rates.

Another mainstream literature on bank capital focuses on the speed of the capital ratio adjustment towards the target capital. Although the literature is not extensive, there exists evidence of the presence of heterogeneity in the rate of adjustment at which the banks close the gap between their actual and target capital ratios. Studies report various sources of heterogeneity. For instance, Berger et al. (2008) document that banks actively manage their capital ratio and the speed of adjustment towards a target level of capital is determined by the current level of bank capital and the regulatory pressure. De Jonghe and Öztekin (2015) use a sample of international banks to study the determinants of the capital ratio speed of adjustment. Their analysis reveals that the capital ratio rate of adjustment in the banking sector varies with country-level characteristics. Specifically, banks operating in countries with a more stringent regulatory environment, better governance mechanisms, developed capital markets and high inflation are more likely to achieve target capital at a much faster rate. Memmel and Raupach (2010) use a sample of German banks to examine the driving forces of the speed of capital ratio adjustment towards a target level of capital. Consistent with the existing literature, they report that the rate of adjustment towards target level of capital varies across banks and over time. They conclude that in addition to bank-specific characteristics, regulatory pressure plays a significant role in determining the capital ratio and the speed of adjustment towards a target level of capital. In a more recent study by Berger et al. (2017) report that market competition induced from deregulation has a significant positive impact on banks target capital ratio and the speed of adjustment towards the target capital ratio.

Recently, in the banking governance literature there is an increasing trend of studying a relationship between internal corporate governance mechanisms and bank capital. This strand of the literature provides evidence on how corporate governance structure influences bank capital levels and its dynamics (Anginer et al., 2018; Anginer et al., 2016; Beltratti and Stulz, 2012; Erkens et al., 2012; Pathan, 2009; Vallascas et al., 2017). For instance, Molyneux and Chunxia Jiang (2014) use a sample of Chinese banks to examine bank ownership structure and its impact on capital structure dynamics. They report that private banks hold more capital and are more likely to make a quick adjustment towards target capital levels compared to public banks. Similarly, Anginer et al. (2016) studies board structure as a determinant of bank capital. They claim that banks with good governance (shareholder-friendly governance) prefer low capital levels which provide evidence that shareholders aim to transfer risk onto financial safety nets. In a more recent cross-country study Anginer et al., (2018) examines the nexus between shareholder friendly boards and bank risks. They employ various measures to capture bank risk one of which is the bank leverage ratio (calculated by dividing the sum of the market value of equity and the book value of liabilities by the market value of equity). They find that banks with shareholder friendly governance, measured as bank board independence and a governance index, take more risk as they have more incentives to shift risk onto creditors and taxpayers.

Nevertheless, the potential relationship between bank capital dynamics and board structure (i.e. board independence and independent directors financial expertise) has been surprisingly overlooked by the extant studies.

The banking literature does not study the direct impact of corporate board structures (board independence and independent directors financial expertise) on the dynamics of bank capital. The nexus between capital dynamics and governance is more explored by studies on

non-financial firms. For instance, Berger et al. (1997) report that managerial entrenched firms avoid debt financing and Friend and Lang (1988) show that firms with highly independent boards prefer to have a higher leverage ratio, where an inverse relationship is documented by Jiraporn and Gleason (2007) between the degree of shareholder rights and firm leverage. In a more conclusive study, Morellec et al. (2012) establish both theoretically and empirically that agency conflicts are the first order determinants of leverage choice and capital adjustment process. Their hypothesis is further validated by several empirical studies. For instance, from the capital structure speed of adjustment perspective, Liao et al. (2015) document that firms with a greater percentage of independent directors on the board adjust to managers' desired capital ratio more slowly. While Chang et al. (2014) report that the quality of corporate governance mechanisms has a significant impact on the rate at which a firms adjust their capital towards target capital levels.

Based on the above-reviewed studies the fourth chapter aims to fill the gap in the literature by studying the nexus between bank corporate board structure and capital dynamics.

2.7 Regulation and Bank Governance (Substitution or Complement?)

The extant literature suggests that regulation can substitute or complement the internal corporate governance mechanism of regulated firms. The studies which take the substitution view claim that the benefits of internal monitoring are limited in a regulated industry where management actions are transparent or are subject to regulators. For instance, Joskow et al. (1993) use a sample of 800 large U.S. firms for the period 1970 – 1990 to study the impact of regulation on CEO compensation. They compare the change in CEO compensation in firms which experienced deregulation during their sample period. Their analysis shows that heavily regulated industry offers low compensation to its executives as

compared to its counterparts. In a similar context, a study on banks by Becher et al. (2005) use the deregulation wave in the US banking sector during the 1990s as a natural experiment to examine the effect of regulations on the compensation of bank directors. They report that bank directors in the early 1990s used to receive significantly less equity-based compensation compared to non-bank firms (unregulated industries). Nevertheless, they find that after deregulation (the late 1990s) banks increased the equity-based compensation component in directors' incentive schemes which closely resembles the equity-based compensation of non-bank firms. In sum, these studies are of the view that regulation can substitute for the traditional governance mechanism by reducing the effect of managerial control on shareholders wealth. Nevertheless, the substitution aspect attracted criticism as a group of studies claim that the accountability of CEOs in a regulated industry is not significantly different from the non-regulated industry (Hadlock et al., 2002). Moreover, the low incentives of bank CEOs are attributed to the difference in investment opportunities rather than because of a regulatory effect (Houston and James, 1995).

Another group of studies takes a different perspective, claiming that regulation can complement internal governance mechanisms but cannot totally substitute for them. The intuition behind this notion is that when regulated firms experience external regulatory pressure, such as the threat of corrective action, it forces them to enhance the quality of board monitoring (Joskow et al., 1993; Booth et al., 2002). The potential interplay between bank internal governance and regulation has been investigated empirically by a number of studies that highlight the fact that regulations complement the internal corporate governance mechanism (Becher et al., 2011; Hagendorff et al., 2010; Li et al., 2013). For instance, Hagendorff et al. (2010) examine the influence of industry regulations on board monitoring. They show that board independence has a positive impact on acquisition performance only if the bank operates in a country which has a strict regulatory environment. While they find

no evidence of a positive impact of board independence on acquisition performance for banks operating in the less strict regulatory environment. They conclude that bank regulation complements internal corporate governance mechanisms. In a similar context, the Becher et al., (2011) study reveals that regulatory pressure forces regulated firms (including banks) to have better monitoring mechanisms. Their findings support the Hagendorff et al. (2011) study that regulation complements the corporate governance mechanism. Using a sample of 277 banks across 55 countries Li et al. (2013) study the influence of regulation on banks' internal corporate governance mechanisms. They report that banks operating in a strict regulatory environment are more likely to reduce their board independence. They argue that strict regulations compromise shareholders' value enhancing goals.

Additionally, the banking literature also provides evidence on the effect of country-level regulation on corporate governance mechanisms. Using data on 279 banks across 48 countries. Laeven et al. (2009) study the effect of country-level regulations on bank risk-taking. They find a significant difference in risk-taking in banks with similar ownership structures but operating in different regulatory environments. More specifically, they report that banks' strict regulatory environment increases risk-taking in banks with large shareholder ownership and lowers risk exposure in widely held banks. Klomp et al. (2012) on the other hand report that regulation decreases the bank risk only for those banks which are high-risk banks. Nevertheless, they find no significant impact of regulation on banks' risk profile which is already risk-averse. These results hold for the sample of 200 banks across 21 OECD countries for the period 2002- 2008.

Despite the extant literature which provides evidence that bank regulation can potentially complement corporate governance mechanisms, no study has examined this complementary effect in the context of capital structure dynamics. Chapter 4 of this thesis

fill this gap in the literature by examining the complementary effect of regulation on internal governance mechanisms from the context of bank capital.

2.8 Conclusion

The global crisis has stimulated the debate on the role of corporate governance in triggering financial distress in the financial sector. This chapter has summarised the key concepts of corporate governance, how it is different for banking organisations, and it has reviewed the extant literature on banking governance to give an overview of governance mechanism and their implications on the financial stability of individual financial institutions and the overall banking sector.

The rest of the thesis comprises empirical chapters which examine the implication of directors' specific characteristics and the structure of the corporate board on bank performance (and risk-taking) and capital structure management. In specific, chapter 3 extends the literature on CEO directors by examining the directors-board matching phenomenon in the banking sector and the implication of appointing CEO directors from financial and non-financial firms on bank performance and risk exposure. Furthermore, the chapter also extends the analysis to the effect of bank board membership on the performance of CEO firms. Chapter 4 employs a dynamic speed of adjustment model to study the impact of board independence and financial expert independent directors on bank capital management. Moreover, the chapter examines the complementary effect of bank regulation on the nexus between the internal governance structure and capital management. Finally, chapter 5 concludes the study.

3 Outside CEOs of Financial and Non-Financial Firms as Independent Directors on Bank Boards

3.1 Introduction

Outside CEOs, namely CEOs of other firms, are often members of bank boards. For instance, in the unique dataset I employ in this chapter, consisting of 496 U.S. banks from 2001 to 2014 and 3420 director appointments, I observe that 57% of banks have at least one outside CEO on the board, and approximately 14% of independent director appointments refer to outside CEOs. Over the sample period, outside CEOs are present on the boards of large and small banks; for example, CitiGroup appointed Andrew N. Liveris, the CEO of the DOW Chemical Company, onto its board, in 2006, and Iberiabank appointed John N. Casbon, the CEO of First American Transportation Title Insurance Company, in 2001.

In spite of the broad presence of outside CEO on bank boards, the growing literature on independent directors in banking (Minton et al., 2014; Anginer et al., 2016; Vallascas et al., 2017) has so far ignored their role. This chapter contributes to filling this gap by answering two questions: What drives the matching between bank boards and outside CEOs? And is this matching beneficial for the appointing bank and/or the outside CEO firm?

Giving answers to the above questions is important for the banking industry. In theory, outside CEOs are an important addition to bank boards as they possess a unique and extensive human and social capital (Booth and Deli, 1996; Perry and Peyer, 2005; Fahlenbrach, Low and René M Stulz, 2010; Horner, 2015; Kang et al., 2018).

Banks are, however, complex organisations (Philippon et al., 2012) and the specificities of the banking industry make it a priori unclear whether the matching between outside CEOs and bank boards is always in the interest of the appointing bank. In particular, the specific nature of the banking business can influence the demand and the supply of outside CEOs for bank boards and the related outcomes post-appointment. From the demand side, as banks normally run a very diversified business model, any outside CEOs might provide some informational advantages to bank boards, as those typically associated with directors employed in "related industries" (Dass et al., 2014), thus indicating benefits from their addition to bank boards. Nevertheless, the magnitude of these benefits, and the related identification of which outside CEO might be preferable to appoint depends on how much the industry knowledge of the outside CEO relates to the primary segments of a bank's business model.

When I account for the supply side, however, it becomes questionable whether the potential benefits brought by the skills of the outside CEOs to bank boards materialize post-appointment. This is because a bank business model also impacts on the potential benefits of the board membership for the outside CEO firm and this may affect how the CEO behaves as an independent director on the bank board. For instance, a firm's expectations of financial advantages from the appointment (Perry and Peyer, 2005) might become more relevant when it is heavily dependent on bank debt and this may undermine the incentives of the outside CEO to act as a "truly independent director" (Adams and Mehran, 2012; Minton et al., 2014).

To elaborate on the above points, I construct an empirical setting, based on US bank director appointments from 2001 to 2014, on two elements. First, I identify the industries in which the outside CEOs are employed, differentiating outside CEOs of

financial firms from outside CEOs of non-financial firms. Second, I account for the investment policies of the appointing banks by broadly distinguishing lending-focused institutions from other, more innovative, banks.[45] Essentially, I postulate that the interplay between the industry of the primary firm of the appointed CEO directors and the investment policy of the bank should reflect the potential benefits of the directorship for the appointing bank and for the outside CEO firm, thus affecting i) the matching between bank boards and outside CEOs and ii) the implications of the board membership for the appointing bank and the outside CEO firm.

I start the analysis by documenting that, in line with my prior, outside CEOs from financial firms are primarily appointed by "less traditional" banks, whereas outside CEOs from non-financial firms gain primarily board memberships in lending-focused banks. This conclusion holds when I control for the characteristics of the outside CEO. Furthermore,

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[4] Firms are classified as financial and non-financial on the basis of their Standard Industrial Classification (SIC) code. Accordingly, the CEOs from financial firms are those whose primary firm has a SIC code from 6000 to 6799 (with the exclusion of SIC codes identifying banking firms). All other CEOs are then classified as managing non-financial firms. Additional checks show that the CEOs from non-financial firms do not have a past working experience in a bank or another financial firm.

[5] It is important to note here that I distinguish lending focused banks from non-traditional banks based on their degree of income diversification which is measured using interest income to total income ratio. These banks can also be referred as diversified (less lending focused) and non-diversified banks (lending focused).

the findings are specific to outside CEOs and do not extend to other independent directors coming from a similar industry but lacking (observable) managerial leadership skills.

To understand if shareholders anticipate benefits for the demand side (the appointing bank) or the supply side (the outside CEO firm) from the appointment, I next examine the short-term wealth effect of the appointment for the appointing bank and the outside CEO firm.

Studies on non-financial firms suggest I should observe higher abnormal returns for the appointing firm if shareholders anticipate better performance and/or a certification of the market value of the bank from the appointment (Fahlenbrach et al., 2010). I find the highest abnormal returns when an outside CEO from a financial-firm is appointed onto a bank board. The appointment of CEO directors from non-financial firms does not produce higher abnormal returns than insider appointments and is associated with lower abnormal returns when compared to the appointment of non-CEO directors currently employed in financial firms. In essence, in my sample, bank shareholders value an on-going working experience within the financial industry, especially if associated with a CEO role, significantly more than a managerial leadership experience in non-financial firms.

The analysis of the market reaction of the outside CEO firm provides, however, a substantially different picture. Only the shareholders of non-financial firms assign a value to the appointment of their CEO onto a bank board, especially if the appointing bank is heavily involved in lending. All in all, I find evidence that shareholders of non-financial firms anticipate significant financial benefits for their firm from the board membership (Perry and Peyer, 2005). Overall, the distribution of the expected gains from the bank board membership between the appointing bank and the outside CEO firm vary significantly across different matchings.

I further progress the analysis by evaluating whether the differences in the short-term wealth effects highlighted above translate to meaningful long-term differences for the board of the appointing bank and, consequently, for bank shareholders. To this end, I initially assess the implications of the appointment on a bank's business choices. My prior is that differences in the industry of provenance of outside CEOs, and in the related expertise, should be at minimum reflected in how a bank's business model evolves after the outside CEO's appointment (Burak Güner et al., 2008; Dass et al., 2014; Huang, 2014; Wang et al., 2015).

As compared to other director appointments on bank boards, I find that banks significantly increase their non-interest-based activity after the appointment of an outside CEO from a financial firm, while they further increase the importance of the lending business after the appointment of an outside CEO from a non-financial firm. However, I next show that only in the case of the appointment of CEOs from financial firms do the observed business changes reflect an improvement in a bank board's advising quality, as they are accompanied by an increase in a bank's profitability and a decline in tail risk.

In summary, differently, from recent evidence reported for non-financial firms (Fahlenbrach et al., 2010), I find a performance effect following the appointment of outside CEOs onto bank boards, though this effect materializes only when the appointed outside CEO is managing a financial firm. The conclusions hold in a number of alternative empirical settings, including when I account for the endogeneity of director appointments using instrumental variables based on the demand and supply theory of director appointments (Knyazeva et al., 2013).

I achieve similar conclusions on the benefits of appointing outside CEOs from financial firms onto bank boards when I extend the analysis to the quality of board

monitoring that I measure in terms of the performance sensitivity of bank CEO compensation (as in Aggarwal and Sammick (1999) and Gao and Li (2015)) and turnover likelihood (as in Fahlenbrach et al. (2010), Gao and Li (2015) and Goyal and Park (2002)). The results indicate that the presence of CEO directors from financial firms on bank boards increases the performance sensitivity of bank CEO compensation and turnover. In contrast, I do not find any significant effects associated with the presence of outside CEOs from non-financial firms.

Overall, the analysis suggests that the matching between bank-boards and outside CEOs from non-financial firms is not beneficial for the appointing bank. As indicated by the market reaction of the shareholders of the outside CEO non-financial firm, the matching could then primarily reflect supply-side factors – namely, the appointment of outside CEOs onto bank boards is beneficial to the 'supplying' firm. In an attempt to validate this argument, I conclude by examining whether the outside CEO's firm obtains more bank debt and improves performance after the appointment. I find evidence of an increase in the industry-adjusted bank exposure for all firms of the outside CEOs, but this increase is significantly larger in the case of non-financial firms. Furthermore, these firms realize larger gains in profitability and increase in their risk exposure post-appointment.

The study offers several contributions to the literature. First, the chapter contributes to the literature on directors-board matching in banking via the first analysis of independent director appointments in banking firms. Existing studies have merely focused on the short-term value effects of the appointment of executive directors (Nguyen et al., 2015). More generally, the study is related to the literature on the nexus between bank board composition, performance and risk-taking (see, for instance, Adams and Mehran, 2012;

Berger et al., 2014; Minton et al., 2014). This literature is primarily based on the structural characteristics of bank boards and not on director appointments.

Second, the work extends and complements studies of outside CEOs on corporate boards (Fich, 2005; Fahlenbrach, Low and René M Stulz, 2010) by demonstrating the importance of the industry where CEOs come from and the business model of the bank in understanding the drivers of their appointment onto bank boards and the related effects for the appointing bank and the outside CEO firm. Finally, the analysis extends the management and finance literature that sees the industry expertise of a director as an important component of his/her human and social capital (Carpenter et al., 2001; Kor and Sundaramurthy, 2009) and, in particular, studies on director expertise in related industries (Dass et al., 2014).

Third, by studying the impact of directors skills and expertise on bank performance and risk taking the chapter also contributes to the more recent literature on directors' skill set which suggest that directors with appropriate and industry relevant skills outperform other directors (Adams et al., 2018).

The chapter proceeds as follows. Section 3.2 discusses the main literature, while section 3.3 focuses on the sample selection and composition. Section 3.4 presents the empirical results for the matching analysis, section 3.5 focuses on the market reaction on the appointment of CEO director on bank board. Section 3.6 and 3.7 discusses results on the advising and monitoring quality of CEO directors. Section 3.8 focuses on the appointment implications for outside CEO firm. Finally, section 3.9 concludes.

3.2 Related Literature

3.2.1 Outside CEOs and Board Matching

The director-board matching theory suggest that matching between directors and firms is not a random process rather matching takes place in a more controlled two-way fashion. Many directors will choose to be director of a firm based on the benefits they get from the appointing firm. These benefits may include compensation, a workload, and other non-monetary benefits e.g. reputation (Fahlenbrach et al., 2010; Masulis and Mobbs, 2014). (Masulis and Mobbs, 2014; 2015) show that directors are more inclined to sit on board of large and financially strong firms which increase their reputation in directors' labour market and also the probability of appointment as a director in the future. (Fahlenbrach et al., 2010) study the appointment of CEO director on boards of non-financial firms and established that CEOs are time constrained thus outside CEO directors prefer firms that are close to their primary firms as it minimise the time they allocate to the directorship. Similarly, firms on the other hand would like to appoint directors with certain skill set i.e. directors with industry relevant experience and knowledge. For instance, (Hillman et al., 2009) use resource dependence theory to justify that firms appoint directors based on the current requirement of their board or future plans, such as expanding business into new market or sector. Moreover, recent studies also claim that director-firm matching is also subject to the business similarities of the appointing firm and the primary firm of the outside director (Stuart and Yim, 2010).[6] Thus it can be argued that the matching between outside CEOs

[6] The two way matching between directors and firms also give rise to a well-known endogeneity problem in the corporate governance literature (Roberts and Whited, 2013; Wintoki et al., 2012). The endogeneity arises when directors have a choice to choose the firm that provide

and bank boards is the result of the intersection between demand and supply factors (Fahlenbrach et al., 2010).

From the demand side, the extensive human and social capital, and the related set of skills, of active CEOs make them potentially the most desirable candidates among independent directors to improve the monitoring and advising quality of a board (Booth and Deli, 1996; Perry and Peyer, 2005; Horner, 2015). Human capital identifies the knowledge and expertise directors gain through their education, training and experience working in particular firms and industries (Becker, 1993). Social capital refers to a director's access, through their personal contacts, to resources and valuable professionals in their networks (Burt, 1992).

Evidence on how the human and social capital of independent directors influences the activity of bank boards is, however, limited to forms of financial expertise (Minton et al., 2014) or banking experience (Cunat and Garicano, 2010; Fernandes et al., 2017; Hau and M. Thum, 2009) and to the global crisis period. Studies on non-bank firms however show that the presence of directors with extensive human and social capital on corporate boards not only improves the overall monitoring and advising quality of the board but also the firm performance (see Baran and Forst, 2015; Bodnaruk and Simonov, 2014; Hillman, 2005; Strahan and Kroszner, 2001; White et al., 2014). By studying the presence of CEO

maximum benefits to them. For instance, directors choose to sit on boards of financial sound firms to guard their reputation stake. This self-selection produce biased results and make it uncertain to identify if the causation is actually reversed (e.g., performance drives governance) or if governance is merely a symptom of an underlying unobservable factor, which also affects performance (Wintoki et al., 2012).

directors on bank boards, Specifically this chapter might then contribute to the regulatory quest for an improvement in the quality of bank boards by ensuring that independent directors have an adequate skill set (Basel Committee on Banking Supervision, 2010, 2015; OCC, 2016)

From the supply side, is highly sought-after independent directors, outside CEOs can select the best directorship opportunities available in the market and cluster in firms that provide them with reputational security (Fahlenbrach et al., 2010). Hence, their presence on boards might reassure investors about the quality and the strength of the appointing firm, independently of their actual contribution to the board monitoring and advise quality. Furthermore, by choosing a directorship, outside CEOs can have opportunities to enhance the value of their primary firm as they might learn about different management styles and/or strategies used in other firms (Booth and Deli, 1996; Carpenter and Westphal, 2001; Perry and Peyer, 2005), establish networks and/or monitor business relationships (Mace, 1986; Rosenstein and Wyatt, 1994; Loderer and Peyer, 2002).

However, the particular business model of the bank, and its synergies with the current industry where the outside CEO is employed can influence the demand and supply factors that drive the matching with outside CEOs. More precisely, banks engage in lending activities with different industries and diversify their business into numerous segments of the financial industry. From the bank perspective, and differently from non-financial firms, all the appointed outside CEOs are potentially a source of relevant industry knowledge and a way to access to industry contacts to enhance a bank's understanding of the business environment (Dass et al., 2014). Nonetheless, the relevance of this knowledge for the appointing banks should depend on their primary business focus. Specifically, the boards of non-lending (lending) oriented banks might find the expertise of outside CEOs of

financial firms (non-financial firms) to be more beneficial, their industry knowledge being more closely linked to the key business lines of the bank.

Furthermore, from the perspective of the outside CEO firms (supply side), the business model of the bank might signal the potential benefits that can be obtained from the directorship in terms of shareholder value (see Perry and Peyer (2005) for a related argument). For instance, those corporations that aim primarily at facilitating their lending relationships by building their network with bank executives might see as more beneficial the directorships of their CEOs in a lending oriented bank. Being in a bank's board is then attractive for these CEOs to gain potential access to credit market expertise, knowledge, and networking opportunities with banks' executives (Booth and Deli, 1999; Perry and Peyer, 2005).

Overall, the matching of outside CEOs for bank boards, and the consequent appointment likelihood should then depend on the interaction between the industry of the outside CEO and the business model of the appointing banks. This interaction reflects the potential benefits of the appointment not only for the bank but also for the outside CEO firm.

3.2.2 The Consequences of Outside CEO Appointments onto Bank Boards

Who realizes larger benefits from the outside CEO-bank board matching is ex-ante unclear. The existing literature on non-financial firms has normally taken the perspective of the appointing firm with a focus on how the board monitoring and advising quality change post the outside CEO appointment. However, the conclusions are mixed (Perry and Peyer, 2005; Fich, 2005; Fahlenbrach, Low and René M Stulz, 2010) (Fich, 2005; Perry and Peyer, 2005; Fahlenbrach et al., 2010).

Kang et al. (2018) offer a potential explanation for the mixed findings by documenting that not all outside CEOs have the same implications for a firm's board activity. Companies with a larger fraction of independent directors with CEO experience in the firm's industry enhance value-added growth especially if these directors are current CEOs. In the case of banks, while these findings are not directly applicable (as banks cannot appoint current CEO of other banks as independent directors - see Adams and Mehran, 2012), they might indicate that the potential synergies between a bank's business models and the industry of the outside CEOs not only influence the matching likelihood but also the post-appointment effects.

The potential effects for the appointing banks become, however, even more, problematic to predict when I account for the fact that outside CEOs manage firms that tend to have lending relationships with banks. The interest in developing/maintaining lending relationships and networking with bank executives might imply that outside CEOs do not necessarily act as "truly independent directors" and see as their primary objectives the interests of bank shareholders (Adams and Mehran, 2012).[7] This is likely to occur especially when the primary firm of the outside CEO depends heavily on bank lending and when the directorship offers larger opportunities to improve the credit access to the outside CEO primary firm.

In this respect, a related group of studies document that the presence of commercial bank executives on the boards of non-financial firm facilitates firms in accessing bank loans

[7] Along these lines the Federal Reserve Bank of Atlanta's *The Director's Primer* noted that bank directors often represent some of the best customers of the banks (Federal Reserve Bank of Atlanta, 2002, p. 47).

(Booth and Deli, 1999; Burak Güner et al., 2008; Elif, 2012). Similarly, studies taking the perspective of outside CEO firms, generally based on the short-term wealth effects of the appointment, highlight that shareholders particularly value board memberships in financial firms due to the potential financial benefits for their firm (Perry and Peyer, 2005).

All in all, the intersection between the business model of the bank and the industry of the outside CEO firm has the potential to influence who gains from the bank board membership. On the one hand, closer links between the industry knowledge of the outside CEO and the bank business model should be beneficial to the appointing bank. On the other hand, when outside CEOs have a stronger interest in extracting/maintaining lending benefits for their primary firms from the directorships, as could be the case when they manage firms funded with bank debt and have the opportunity to sit on the board of lending-oriented banks, they might show a lower effectiveness in executing their advising and monitoring roles in the interest of bank shareholders.

3.3 Sample Selection

3.3.1 Identifying Director Appointments in US Banks

The analysis is based on director appointments that occur from 2001 to 2014 in a sample of US banks. I collect accounting and market data for the sampled banks for the period 1998-2015 to reduce the number of missing observations in the post-appointment analysis presented in section 3.6. I use three different databases to construct the final sample.

Board level information is taken from BoardEx that contains items such as board size, director age, and directors' employment (see Cohen et al., 2008; Minton et al., 2014). COMPUSTAT and CRSP are the sources used for accounting data and market data,

respectively. To identify the final sample, I match the population of banks in BoardEx with COMPUSTAT and CRSP and retain only banks that are available in all three databases. Furthermore, to limit survivorship bias I retain inactive and/or acquired banks in the sample.

To ascertain if the director is an active CEO of his/her firm I match the BoardEx board summary data with the BoardEx director's primary employment database by director ID and date of appointment. As in Fahlenbrach et al. (2010), Faleye (2011) and Fich (2005), I define CEO directors as those directors currently holding a CEO position at their primary firm and identified as independent directors in BoardEx. Following Minton et al. (2014) I do not classify directors as independent at the bank holding company level if they are executives in a subsidiary of the bank and as in Fich (2005), I exclude reappointed directors from the sample.

Finally, BoardEx holds limited data before 2004. To reduce missing data, I hand-collected information on directors and bank board structures from DEF-14A reports for all the banks that are present in the dataset from 2004 but missing in the initial part of the sample period. This exercise makes the dataset unique and more extensive, both in terms of the number of banks and the study period than existing US bank governance studies (see, for instance, Minton et al., 2014). The final sample comprises 496 unique banks for which I identify 3,420 director appointments announced over the period 2001 – 2014 and for which I obtain bank accounting and market data for the period 1998-2015.

3.3.2 The Distribution of Director Appointments

I classify appointed directors in several categories. I start by distinguishing outside CEO directors on the basis of the industry of their current company; namely, I separate CEOs from financial firms from CEOs whose current firm is a non-financial firm. Similarly,

I distinguish the remaining independent directors on the basis of where they are working at the time of the appointment.[8] More generally, I classify the remaining appointed directors into i) independent directors employed in a financial firm; ii) independent directors working in a non-financial firm; iii) non-industry directors (academics and directors working in NGOs or other non-business organisations); iv) inside directors - namely, executive directors as classified in BoardEx.

The identification of the current employment of other independent directors is critical to the analysis. For instance, such identification allows us to understand whether any possible differential effect I attribute to outside CEO directors from a given industry extends to other independent directors employed in the same industry or whether it reflects peculiarities due to the fact that the CEO position is held in a specific industry. In fact, a number of studies highlight the importance of industry experience of non-CEO independent directors for the advising and monitoring quality of boards (Kroll et al., 2008; Tian et al., 2011) and for firm performance (Fahlenbrach et al., 2011; Wang et al., 2015).

Table 3-1 reports the yearly distribution of director appointments by director

[8] To categorize the directors, I identify financial and non-financial firms on the basis of Standard Industrial Classification (SIC) codes and flag firms as non-bank financial firms if their SIC code falls within the range 6000-6799. Notably, the group of financial firms excludes banks as the CEO of a bank is not permitted to sit on other bank boards. Firms with a SIC code outside the 6000-6799 range are defined as non-financial firms. CEO directors working in the financial industry are associated with insurance, and investment companies, and diversified financial services. Most of the CEO directors from non-financial firms work in real estate, pharmaceutical companies, business services, construction and building firms, health and information technology companies.

category. Of the 3,420 independent director appointments, 374 are current CEOs, of which 223 are from financial firms and 151 from non-financial firms. 2,322 appointed directors are independent non-CEO directors (with 1,325 employed in financial firms, 898 in non-financial firms and 99 in academia, an NGO or other non-corporations) and the remaining 724 directors are insiders.

Insert Table 3-1 here

The distribution of independent directors by category shows that banks primarily appoint directors working in financial firms. Furthermore, the share of directors acting as CEOs in financial firms ranges from a minimum of 1.56% to a maximum of 8.90% of the yearly number of appointed directors and tends to be generally higher than the share of directors acting as CEOs in non-financial firms. This latter share shows a general decline after the global financial crisis and the related adoption of the Dodd-Frank Act. A similar decrease is seen in the share of independent directors that are not employed in a financial firm when they are appointed.

Finally, there are two key differences between the financial and non-financial firms where the outside CEOs come from. First, as shown in Figure 1, constructed using a sub-sample of 128 companies with financial data and whose CEOs are appointed on bank boards, the average bank debt to total assets ratio is equal to 21% for non-financial firms and only 11% for financial firms. Second, as indicated in Figure 2, a larger proportion of non-financial firms are private. Taken together, these two results indicate that non-financial firms are likely to be highly dependent on bank relationships for their funding choices.

3.4 Modelling Outside CEO-Bank Matching

In this section, I analyse the determinants of outside CEO-bank matching via a multinomial logit model. Essentially, this model estimates the probability of occurrence of an event when the dependent variable is categorical and has more than two categories. The dependent variable (**Director Appointment)** takes the following values: 0 for the appointment of an insider; 1 for the appointment of an outside CEO director from financial firms; 2 for the appointment of an outside CEO director from non-financial firms; 3 for the appointment of a non-CEO independent director from financial firms; 4 for the appointment a non-CEO independent director from a non-financial firm; 5 for the appointment of non-industry directors. Multinomial logit models produce valid estimates only under the assumption of *Independent Irrelevant Alternatives (IIA)*. I verify the IIA assumption holds using the *"mlogtest"* command in STATA.

I estimate the model by controlling for a number of (lagged) potential drivers (described in Table 3-2) of the appointment probability, including bank variables describing business choices.

Insert Table 3-2 here

More precisely, the two key explanatory variables refer to a bank's investment choices and the related need for industry expertise in the board. The first is the ratio between net loans and total assets (**Net Loans**) and indicates the lending focus of a bank. More lending-oriented banks could be more inclined to appoint CEOs from non-financial firms. Similarly, these outside CEOs might be attracted by banks with a stronger lending focus if it is seen as being beneficial to gaining better access conditions in the credit market. The second variable is non-interest income divided by non-interest income plus net interest income

(**Non-Interest Income Share**). Larger values indicate a less traditional bank business model (Saunders et al., 2014) that might benefit from the monitoring and advising skills of directors working in financial firms. One concern with using both net loans and non-interest income in a single model is that they may cause spurious estimates as they might be highly correlated. However, in my sample the correlation between the two variables is only 23%, showing that they capture clearly different aspects of a bank's business policy.

In terms of governance controls, I include the ratio between independent directors and total board members (**Board Independence**). More independent boards should already have better advisory and monitoring skills (see Ryan and Wiggins, 2004; Wagner, 2011; Armstrong et al., 2014), being then less likely to add directors with better-expected monitoring and advising quality. The ratio between the number of outside CEO directors on the board and the total number of board members (**CEO Directors on the Board**) controls for the possibility that CEO directors cluster on bank boards (Fich, 2005; Fahlenbrach et al., 2010). Additionally, similarly to Minton et al., (2014), I account for the influence of financial-expert directors on the appointment choice via the ratio between the number of financial experts and the total number of independent directors on the board (**Board Financial Expertise**).[9] I then control for the average board age, via the log average age of the directors on the board (**Board Age**), and for the log transformation of the total number of board members (**Board Size**). Firms with younger and smaller boards, due to their limited experience, social capital and monitoring quality, may prefer to appoint outside CEO directors to improve the advising and monitoring quality of the board (Hermalin and

[9] I use the SEC definition to identify financial experts on the basis of their current and past working experience and education. https://www.sec.gov/news/press/2003-6.htm.

Weisbach, 1988; Fahlenbrach et al., 2011; Adams and Mehran, 2012).

Two other governance variables are a dummy equal to one if the CEO is also the chairman of the board (**CEO Duality**) and the log of bank's CEO age (**CEO Age**). When a bank's CEO is also the chairman of the board, directors with potentially strong monitoring and advising abilities are more likely to be appointed as shareholders and the board intend to diminish the power of the incumbent CEO (Hermalin and Weisbach, 1998; Shivdasani and Yermack, 1999; Fahlenbrach et al., 2010). Similarly, banks with younger CEOs are expected to hire more knowledgeable and competent directors to benefit from their human and social capital (Worthy et al., 2011). In contrast to this argument, however, the proportion of independent directors on the board increases when a CEO is near retirement age (Hermalin and Weisbach, 1988).

I next control for the potential reputational effects of the board membership. I account for growth opportunities via the log transformation of the market to book value of equity (**Growth Opportunities**), for bank profitability (**Profitability**), that is, bank earnings before interest and tax divided by total assets- and bank size (the log transformation of bank total assets (**Size**)). All these variables should be positively associated with the likelihood to appoint an outside CEO director if reputational security and job opportunities in the director labour market matter (Yermack, 2004; Fahlenbrach et al., 2010; Masulis and Mobbs, 2014; Masulis et al., 2016).

Reputational concerns also arise from banks being undercapitalized as this amplifies the risk of regulatory corrective actions. To account for this, I include the Tier 1 capital ratio (**Tier I Ratio**) in the regression. The existing literature also provides evidence that independent directors avoid risky firms (Fich and Shivdasani, 2006; Masulis and Mobbs, 2014; De Maere et al., 2014). Following Acharya et al. (2017) and Ellul and Yerramilli (2013),

I control for bank tail risk (**Tail Risk**); namely, a bank's average daily return in the lowest 5th of the daily stock return distribution. I also use a dummy variable (**TARP**) that equals one for all the years during which banks remained on the TARP program.[10] These banks may be more willing to appoint directors that are supposed to enhance board monitoring and advising quality.

The final group of controls consists of a dummy equal to one for the period 2007-2009 (**Financial Crisis**) and a dummy equal to one for the years following the adoption of the Dodd-Frank Act in 2010 (**Post Dodd-Frank Act)**. Both the crisis and the Dodd-Frank act might have modified the director skills preferred by banks thus affecting the appointment decision.

3.4.1 Bank Business Models and Outside CEO Appointments

Table 3-3 reports estimates from the multinomial logit regressions described earlier. The model uses as a base category the appointment of inside directors.

Insert Table 3-3 here

The analysis shows that a director's employment makes a significant difference to the determinants of the appointment likelihood on bank boards and more importantly offers evidence that the matching between banks and outside CEOs is driven by a bank's business choices. More precisely, columns (1) and (2) show that CEOs from financial firms are more

[10] The list of banks that have received TARP funding retrieved from https://projects.propublica.org/bailout/list.

likely to sit on the board of banks with a larger non-interest income share, while CEOs from non-financial firms are more likely to sit on the board of more lending focused banks.

There are, however, other differences in what drives the appointment likelihood of the two types of CEO directors. Outside CEOs from financial firms are more likely to be appointed when the incumbent bank CEO is the chairman of the board, as suggested by Hermalin and Weisbach (1998) and Shivdasani and Yermack (1999) but are less likely to sit on bank boards with a higher proportion of outside CEO directors. Furthermore, the likelihood of an appointment of CEO directors from financial firms is higher in less profitable banks and after the adoption of the Dodd-Frank Act. In contrast, outside CEOs from non-financial firms cluster in boards that are larger and with a lower financial expertise and in banks with lower tail risk and higher growth opportunities but also lower capital strength.

Some common determinants between the two groups of outside CEO directors emerge in terms of bank governance. In both cases, the appointment is less likely when banks boards are already more independent, and when the incumbent bank CEO is older. This is consistent with the extant literature (Hermalin and Weisbach, 1988; Worthy et al., 2011). I also find that both types of directors were more likely to join bank boards during the global financial crisis.

The determinants of the appointment of outside CEO directors show also some similarities with the determinants of the appointments of other independent directors that are employed in the same industry. For instance, similarly to outside CEO directors, I find that the likelihood to appoint an independent director employed in a financial firm is higher after the adoption of the Dodd-Frank Act, while the likelihood to appoint an independent director from a non-financial firm is larger when a bank is less risky or more lending focused.

In both categories of non-CEO independent directors, the appointment is more likely in older boards and when banks are larger. In contrast, board size negatively affects the appointment probability (only) for non-CEO directors that are not currently working in financial firms. Where CEO duality increases the probability of appointment of non-CEO directors working in both sectors. Finally, non-industry directors cluster in larger, more profitable and more capitalized banks and in boards that are older.

In general, I find evidence that the matching between outside CEOs and banks is driven by the business choices of the bank. Interestingly, I do not find instead evidence that outside CEOs are more concerned of their reputation than other independent directors when they match with bank boards as suggested by previous studies on non-financial firms (see Fahlenbrach et al., 2011). Furthermore, only for CEOs from financial firms do a number of the conditions that are expected to be associated with the pressure to enhance board expertise and monitoring (CEO duality, the low degree of bank profitability, the adoption of the Dodd-Frank Act) significantly influence the appointment likelihood.

3.4.2 Appointment Model: Additional Controls

As the baseline specification does not account for any dimensions of a director's human and social capital that might be expected to influence the demand for directors by bank boards, the results may be affected by omitted variables. To assess this possibility, I extend the analysis to control for director specific characteristics that might have an impact on the appointment decision. I focus on four director characteristics that capture relevant aspects of a director's human and social capital.

The first variable is the total number of board memberships a director had prior to the appointment onto a bank's board (**Outside Directorships)**. This variable captures a director's popularity in the directorship market and a potential network effect generated by

the appointment (Ferris et al., 2003). The second variable is the total number of years a director has served on the boards of other firms before the appointment (**Directorship Experience**). This variable controls for the fact that more experienced directors may have more extensive human and social capital (Hillman et al., 2011; Worthy et al., 2011). The variable **Financial Qualification** takes a value of one if the appointed director has a financial qualification as indicated by a degree related to accounting and finance. I employ this variable as previous studies show that directors' and executives' performance also depends on their qualifications (see Berger et al., 2014; King et al., 2016; Nguyen et al., 2015). The last variable (**Director Network Size)** controls for the fact that directors with greater social capital are more likely to gain outside directorships. [11]

I repeat the appointment analysis reported in Table 3-3 by adding these variables as additional controls and present the results in the Appendix (Table 3-11). I still find that non-financial firm CEOs are more likely to match with lending-oriented banks and financial firm CEOs with high non-interest income banks. The analysis also shows that, with the exception of CEO directors from financial firms, at least one of the additional variables enters the model with a significant coefficient in the appointment regression.[12] Overall, the results in this section are in line with the main findings.

[11] The variable *Director Network Size* is taken from BoardEx and is defined as the number of individuals with whom the director overlaps while employed in a corporation, involved in other activities or in education roles.

[12] For instance, CEOs from non-financial firms are more likely to be appointed by banks when they have a larger number of outside directorships. Other independent directors coming from financial firms are more likely to be appointed when they hold a financial qualification and have

3.5 Who Benefits from Outside CEO-Bank Board Matching?

This section investigates who benefits from the outside-CEO-board matching. I initially focus on the short-term effect of the appointment for the appointing bank and the outside CEO firm. I next focus on the implications for the advising and monitoring quality of bank boards, to conclude with an investigation of the changes in the access to credit, profitability and risk of the outside CEO firm post-appointment.

3.5.1 CEO Director Appointments and Investor Reaction in the Appointing Bank

The appointment of an outside CEO in the boardroom of non-financial firms is normally associated with larger abnormal returns on the announcement day as compared to those observed for the appointment of other independent directors (Fahlenbrach et al., 2010; Fich, 2005). This can be explained by a certification effect; namely, CEO directors have more reputational capital at stake and this should induce them to join the board of a firm only when they have an extremely positive opinion of the firm (Fich, 2005; Fahlenbrach et al. 2010; Faleye, 2011). However, the positive market reaction might also capture a performance effect related to CEO directors being perceived as improving the monitoring and advising quality of boards (Fahlenbrach et al., 2010).

I extend the existing studies on non-financial firms by examining whether a differential effect in terms of market reaction emerges when a bank appoints a CEO director working in a specific industry as compared to other types of independent directors employed in a similar industry. This analysis is also related to studies showing that the

greater network size. This latter variable positively influences the appointment probability of the remaining two categories of independent directors

market reaction and the related abnormal returns also differ when (non-CEO) independent directors with specific characteristics are appointed (Defond et al., 2005; Francis et al., 2015).

I conduct the analysis by using a standard event study methodology (Brown and Warner, 1985; Dodd and Warner, 1983). From the sample of 3420 appointments, I identify the appointment date for 1,987 events from BoardEx and DEF 14-A reports.[13] Following the extant literature (Fich, 2005; Fahlenbrach et al., 2010) I exclude appointments whose announcement dates occur at the same time as the announcement of other company events (such as mergers and acquisitions), dates with multiple directors appointment announcements and other bank restructuring events. This filter leaves us with a sample of 1,503 total appointments.[14]

I use the equal-weighted CRSP market index in the market model to estimate abnormal returns (see Brown and Warner, 1985; Fich, 2005; Huang, 2014). The market model is estimated over an estimation window of 300 days to 61 days prior to the event date and I compute cumulative abnormal returns for a three-day event window [-1 +1 day].[15]

[13] BoardEx *"Company News"* dataset is used to identify announcement dates and confounding events.

[14] More precisely, this sample includes 230 CEO director appointments (172 referring to CEOs from financial firms and 58 to CEOs from non-financial firms) and 1,273 other director appointment announcements of which 377 appointed directors are inside directors, and 896 are independent directors of which 536 are working in financial firms and 360 in non-financial firms.

[15] The results remain similar if I calculate abnormal returns for the event window [-3 days, +3 days].

Insert Table 3-4 here

I report the univariate results from Panel A to Panel D in Table 3-4. The results, reported in Panel A, show there is a significant difference between the mean and median CARs generated by the appointment of CEO directors from financial firms and from non-financial firms. In essence, bank shareholders value the appointment of CEO directors from financial firms significantly more than the appointment of other CEO directors. In the case of banks, therefore, investors not only value the executive position of the appointed outside directors but also the financial industry experience of the directors.

I next report in Panel B the difference in the mean and median of CARs for CEO directors from financial firms and non-CEO independent directors working in financial firms. This test is important to understanding whether the industry experience is valued more when combined with a CEO position. The univariate analysis provides support for this latter argument. I find that bank shareholders value the appointment of CEO directors from financial firms more than the appointment of independent directors working in financial firms who lack a leadership position at the time of the appointment. Interestingly, by comparing the results in Panels A and B, I observe that the CARs associated with the appointment of non-CEO independent directors from financial firms are on average higher than the CARs due the appointment of CEO directors from non-financial firms. Panel C reports a similar test, as that shown in Panel B, by comparing CEO directors from non-financial firms and non-CEO independent directors working in non-financial firms. I do not find any significant difference between these two groups of directors. In Panel D I report the difference in abnormal returns around the appointment of a financial firm other independent directors and non-financial firm CEO directors. I find a significant difference

between the two groups of directors with the appointment of other independent directors from financial firms resulting in higher abnormal returns.

In Panel E I achieve similar conclusions when I use a multivariate setting to examine cross-sectional differences in the CARs produced by the appointment of directors onto bank boards. I estimate multivariate regressions that include a set of dummy variables that identify the different types of director appointments, defined as in the multinomial regression analysis, and a number of control variables (similar to what I have included in the appointment model). These controls aim at capturing factors other than directors' appointments that might affect the cross-sectional variation in the estimated CARs.

Finally, to add confidence to the fact that the results discussed above are not spurious but reflect the market reaction related to independent director skills, in the Appendix (Table 3-12) I conduct a placebo test where I use the abnormal returns (for a 3-day window) computed 30 days before the appointment as the dependent variable in the cross-sectional tests. This analysis does not show any significant relationship between director appointments and the anticipated CARs.

Taken together the results of this section document that the appointment of an outside CEO onto a bank board is perceived as being more beneficial by bank shareholders when the CEO comes from a financial firm. Furthermore, non-CEO independent directors working in financial firms at the time of the appointment are perceived by bank shareholders as being more valuable than outside CEO directors from non-financial firms.

3.5.2 The Reaction of the Shareholders of the Outside CEO Firm

I next examine the value implications for the firm of the outside CEO. A bank directorship should benefit outside CEOs with access to credit market expertise, knowledge

and networking opportunities with the financial institutions' executives (Perry and Peyer, 2005). Consequently, the appointment of a CEO onto a bank's board generally sends a positive signal to the shareholders about the financial prospects of the firm. This should be especially the case for non-financial firms as they tend to be more funded with bank debt, as shown in section 3.3.

I conduct the analysis using the appointment of outside CEOs from public firms. After filtering for appointments with multiple announcements, I have 128 events: 86 are financial firm CEO director appointments and 42 are non-financial firm CEO director appointments.

Panel A of Table 3-5 shows the abnormal returns of the company of the outside CEO directors around his/her appointment onto a bank board. As shown in columns (1) and (2), respectively, the abnormal returns produced by the appointment of CEOs from non-financial firms are positive and highly significant. Column (3) reports the differences between the financial and non-financial sector CEO directors' parent company returns. I find that shareholders value significantly more the appointment of a non-financial sector CEO director onto bank boards than the appointment of a financial sector CEO director.

Insert Table 3-5 here

As mentioned earlier, a possible interpretation of the results is that the shareholders of non-financial firms anticipate larger benefits in the credit market when their CEOs are appointed onto bank boards. I provide some evidence consistent with this interpretation in Panels B and C where I report abnormal returns of the CEO primary company based on the business model (lending activity and non-interest income) of the bank where their CEOs are appointed. Essentially, in Panel B I repeat the event study analysis for appointing banks with a loan-to-asset ratio larger (lower) than the sample median. I find that shareholders of

non-financial firms' value more the appointment of their CEOs in more lending-oriented banks. In contrast, for the shareholders of financial firms the lending orientation of the appointing banks does not matter.

It might be suggested that the shareholders of financial firms may see as more beneficial directorships obtained by their CEOs in less traditional banks because of potential business synergies with their firm. In Panel C, however, where I repeat the analysis separately for banks with non-interest income greater (less) than the sample median, I do not find support for this argument.

All in all, the analysis in this section indicates significant value benefits for the company of the outside CEO when the company is a non-financial firm. In contrast, shareholders of financial firms do not assign value benefits to their CEOs being appointed to a bank board.

3.6 Bank Board Advising Quality post Outside CEO Appointment

I proceed by testing how the bank advising quality changes after the appointment of an outside CEO director. Initially, I focus on the evolution of business choices, profitability and risk post-appointment. As in section 3.4, I employ two variables to describe a bank's business choices: Net Loans and the Non-interest income share. My conjecture, motivated by the outside CEO-bank matching results, is that if the industry expertise of outside CEOs matters for the appointing banks, I should observe changes in a bank's investment policies after the director appointment towards bank activities in line with this expertise.

In a second step, I then evaluate the changes in bank profitability and risk following an outside CEO director appointment. These additional tests give us an understanding of whether the different skills brought by CEOs directors from financial firms and non-

financial firms translate into differential effects in terms of a bank's profitability and risk exposure. I measure bank profitability via the Return on Assets and risk using Tail Risk as in section 3.4.

To control for industry and time-invariant fixed effects that influence bank business models, profitability and risk I industry-adjusted the variables as in Fahlenbrach et al. (2010) by subtracting the industry mean in the corresponding year from each variable employed in the tests. I then compute the changes in the industry adjusted measures following the appointment as the difference between the average industry adjusted variables from t_{+1} to t_{+3} and the average over the period t_{-2}, t_{-3} (where t_0 is the appointment year). I use the resulting changes in a number of different tests to assess how the appointment is associated with bank business choices, profitability, and risk. I describe these tests and the related results in the following sections.

3.6.1 Univariate Analysis

Measuring changes in bank characteristics around the appointment of a director gives estimates of the effect of the director appointment on the dependent variables that are not influenced by firm fixed effects. However, it does not account for a change in the business variables due to different types of director appointments. To put it differently, it may be the case that any effect I observe on business choices, profitability and risk is related to other director appointments and not to an outside CEO director appointment.

Insert Table 3-6 here

To overcome the issue mentioned above, I initially employ a univariate analysis. I define CEO appointments from financial firms as the "treatment group" and use other types of director appointments as alternative "control groups". This approach provides us

with an opportunity to compare the change in business choices, profitability and risk after the appointment of directors in the "treatment" and "control" groups.

Panel A of Table 3-6 reports the results of the changes in the business model variables to post the director appointment. When compared to the appointment of non-CEO independent directors, as shown in column (1), the appointment of financial firm CEO directors is associated with a decrease in lending and an increase in the non-interest income ratio. I achieve a similar conclusion when the control group consists of non-CEO directors working in financial firms or when the control group includes CEO directors from non-financial firms. The last column of Panel A shows that the appointment of this latter group of directors favours lending activities when compared to the group of non-CEO directors.

In Panel B of Table 3-6, I focus on the changes in bank profitability and risk post the director appointment. Independently of the control group I use, the results reported in the first three columns of Panel B show that the appointment of CEO directors from financial firms leads to an increase in profitability and a lower bank tail risk. The last column shows that the appointment of CEO directors from non-financial firms is not associated with any significant change in bank profitability while it leads to an increase in tail risk.

In summary, differently, from the evidence for non-financial firms, the analysis shows that when CEOs come from the financial industry they do not simply play a certification role, but they contribute to improving bank profitability and risk exposure. In contrast, the appointment of CEO directors from non-financial firms tends to be followed by increases in lending without changes in bank profitability but with an increase in tail risk.

3.6.2 Multivariate Analysis: OLS Regressions and Instrumental Variable Analyses

Next, I analyse the changes in the business choices, profitability and risk of banks after outside CEO appointments in a multivariate setting. I start by estimating OLS regression models (with robust standard errors clustered at the bank level) where the dependent variables are the changes in the industry-adjusted measures I have employed in the univariate tests.

The key explanatory variables are two dummy variables. The first takes a value equal to one when a bank appoints a financial firm CEO director and the second takes a value of one when the CEO director comes from a non-financial firm. In addition, I include a number of control variables. Specifically, I account for bank size (log total assets) and for board structure by including board size, independence, financial expertise, the presence of outside CEOs on the board, bank CEO duality and age. Finally, I control for the financial crisis and the post-Dodd Frank Act period. As in Fahlenbrach et al. (2010), all controls are measured at time *t-1*.

Insert Table 3-7 here

The first four columns of Table 3-7 show results in line with the univariate analysis: the appointment of an outside CEO director from a financial firm is followed by an increase in non-interest-income and a decline in lending. These changes are accompanied by an increasing bank profitability and a lower tail risk. For non-financial firm CEO directors, I observe an increase in the lending activity and in bank tail risk post-appointment.

It might be argued that the results simply capture the trend in the evolution of a bank's business model, independently of the director appointment. To rule out this interpretation,

I conduct a falsification test where I move the appointments 3 years forwards. As shown in the Appendix, table 3-13 in this "artificial" setting the results do not hold.

Another possible concern with the OLS specifications is endogeneity. As highlighted by the appointment analysis, outside CEO directors are not randomly appointed onto boards, rather the appointment takes place with the consent of both the firm and the director. In particular, CEO directors have the opportunity to select the directorships of their choice and this might give rise to a selection bias that increases the chance of spurious results. To control for endogeneity, I repeat the multivariate analysis by employing a 2SLS approach where the dummy variables identifying CEO appointments are treated as endogenous covariates.

The 2SLS model requires us to first estimate the probability to appoint outside CEO directors from financial firms and from non-financial firms by using as key predictors of instrumental variables.[16] The predicted values from the first stage regression are then used as explanatory variables in the second stage regressions on how CEO director appointments influence business choices, profitability and risk. I use two instruments in the analysis. The first is the ratio between the number of financial firms in the state where a bank's headquarters is located scaled by the total employed population in the state *(Financial Firms to Total Employees)*. The second is the ratio between the number of non-financial firms in the

[16] Although the endogenous variables are dummy variables, I use a simple OLS regression in the first stage of the 2SLS regression (see Angrist and Krueger (2001) for the explanation of the efficiency of this approach).

state where a bank's headquarters is located scaled by the total employed population of the state (*Non-Financial Firms to Total Employees)*.

I select the two instruments following the theory of supply and demand of independent directors and recent evidence suggesting that firms recruit directors especially in the local market (Knyazeva et al., 2013) and CEO directors opt for directorships in firms that are closer to their own firms to save travel time (Fahlenbrach et al., 2010). Accordingly, I postulate that a greater ratio between the number of financial firms (non-financial firms) (which represents the supply of CEO Directors) to total employed labour (in a given state) increases the probability to appoint financial (non-financial) firm outside CEO directors. In contrast, there is no a priori theoretical motivation to suggest these two instruments are related to changes in bank characteristics that I employ as dependent variables in the second stage regression.

The validity of the instruments rests on two conditions. First, they must be correlated with the endogenous variables after all the other exogenous variables have been controlled for. As shown in column 5) of Table 3-7, the first-stage regression indicates that the first condition is satisfied: both instruments enter the models with the expected positive sign and are significant at customary levels. Second, the instruments should not be correlated with the error term of the second-stage regression. The Hansen-J test, where the joint null hypothesis is that all instruments are uncorrelated with the error term and that the instruments are correctly excluded from the estimated equation, indicates I cannot reject the hypothesis that the instruments are valid. More importantly, the second stage regressions (reported from column (6) to column (9)) documents that the key conclusions remain in line with the evidence obtained from the univariate tests and from the OLS specifications.

3.6.3 Multivariate Analysis: Alternative Specifications

The relatively low correlation between the instruments and the endogenous variables (as shown by the adjusted R-squared of the first stage regression) raises the possibility that the IV findings are biased and not entirely reliable because of "weak instruments" (Hahn and Hausman, 2003). To account for this I carried out additional robustness tests based on a Jackknife Instrumental Variable regression (proposed by Angrist, Imbens, and Krueger, 1999).

The Jackknife IV technique deals with the bias arising from weak instruments by using a "leave-one-out approach" to estimate fitted values of the instruments to employ in the analysis.[17] In other words, fitted values of the instruments are constructed for each observation *I* using all the remaining observations in the sample (Angrist, Imbens and Krueger, 1999; Staiger and Stock, 1997). I report the findings using this approach from column (1) to column (4) of Table 3-8. The results remain largely the same as of the main analysis. I show consistently that the appointment of CEO directors from financial firms is followed by an increase in bank non-interest income and profitability, and to a decline in bank lending and tail risk, the appointment of CEO directors from non-financial firms is accompanied by increases in bank lending whereas there is not a significant change in bank profitability and tail risk.

[17] I use the STATA user written program "JIVE" to perform this analysis and use the option "jive1" (see Angrist, Imbens and Krueger (1999) and Hahn and Hausman (2003) for details).

Insert Table 3-8 here

Finally, it might be argued that the results are still biased because of time-invariant bank unobserved factors that systematically affect the appointment decision and bank business choices post-appointment. To account for these factors, I estimate an alternative specification with bank fixed effects. Specifically, I employ the full population of banks that includes appointing and non-appointing banks and estimate the results using the following model:

$$Y_{i,t} = \alpha + \beta_1 Post\_FinCEO_{i,t} + \beta_2 Post\_NonFinCEO_{i,t} + \gamma Controls_{i,t} + A_i + \eta_{i,t} \quad (1)$$

The dependent variables $Y_{i,t}$ are the (non-industry adjusted) variables employed earlier observed at time *t*. The $Post\_FinCEO_{i,t}$ and $Post\_NonFinCEO_{i,t}$ are dummy variables that take a value of one for the 3 years following the appointment of financial and non-financial firm CEO directors, respectively; $Controls_{i,t}$ is the same set of controls employed in the previous specifications and A_i are bank fixed effects. The results from fixed effects regressions, reported in Panel B of Table 3-8, are consistent with earlier tests.

3.7 Bank Board Monitoring and Outside CEO Directors

I next examine how the two types of outside CEO directors are associated with the effectiveness of bank board monitoring. To this end, I focus on board monitoring in terms of a bank's CEO pay-performance sensitivity and performance-turnover sensitivity.

More effective board monitoring results in an increase in both bank CEO pay-performance sensitivity and performance-turnover sensitivity. Setting executive

compensation plans is an important duty of board members that contribute to restraining executives from extracting excess compensation (see Bebchuk and Fried, 2004; Yermack, 2004). Furthermore, the corporate directors have to evaluate the quality of a CEO from firm performance and other signals. If firm performance declines below certain a threshold, directors should dismiss the CEO (Goyal and Park, 2002; Brickley, 2003).

For the CEO pay-performance sensitivity, I follow Fahlenbrach et al. (2010), Gao and Li (2015) and Goyal and Park (2002) and estimate a fixed effect model where the dependent variable is the log of total compensation and where I control for year fixed effects. Firm fixed effects control for unobservable time-invariant firm characteristics that might drive both the presence of CEO directors onto the boards and bank CEO compensation. I use compensation data from Execucomp and the Capital IQ database.[18] For the performance turnover sensitivity analysis, I follow Gao and Li (2015) and Goyal and Park (2002) and estimate a logit model where the dependent variable is dummy variable that takes the value of one when the CEO of the bank has changed and remains zero otherwise. I identify 513 turnover events via BoardEX.

The independent variables of interest in both estimations are two dummy variables: 1) **Financial Firm CEO Directors**; 2) **Non-Financial Firm CEO Directors**. Each dummy takes a value of one if at least one director from a given category is present on the board. As I am interested in studying the pay-performance-sensitivity, I follow Aggarwal and Sammick (1999) and Gao and Li (2015) and interact the two dummy variables with two different measures of bank performance - **Profitability** and **Stock Returns** (measured

[18] I use the Execucomp database to retrieve data on bank CEO compensation and use the TDC1 variable for total compensation.

as the buy and hold returns over the fiscal year). The coefficient on the interaction terms captures the incremental difference in pay (turnover)-performance sensitivity across the two categories of CEO directors. In all models, I control for (lagged) board independence, board size, board financial expertise, bank CEO tenure and duality, bank size and risk (Core et al., 1999; Fahlenbrach et al., 2010).

Insert Table 3-9 here

Panel A of Table 3-9 reports the results. The first two columns, where the dependent variable is the log of total compensation, show a positive and statistically significant coefficient on the interaction term between Financial Firm CEO Directors and Profitability (Stock Returns), while the interaction between Non-Financial CEO Directors and Profitability (Stock Returns) is not significant at customary levels.[19]

The last two columns of Panel A Table 3-9 report the estimates from the CEO performance-turnover sensitivity analysis. Estimates for the interaction term between Financial Firm CEO Directors and Profitability is negative and significant. More importantly, given the non-linearity embedded in the logit specification (Norton et al., 2003), it is essential to conduct additional analysis based on marginal effects (reported in Panel B). I find that the probability of CEO turnover increases with a decrease in firm profitability, especially in the presence of Financial Firm CEO Directors. In contrast, this

[19] Table 4-9 also identifies other factors that are related to CEO compensation. Consistent with the extant literature (see Aggarwal and Sammick 1999; Fahlenbrach et al. 2010; Gabaix and Landier 2008) the analysis shows that CEO duality, tenure and (board independence) are positively (negatively) associated with CEO compensation, while size, stock returns and profitability are positively related to CEO total compensation.

does not occur when Non-Financial Firm CEOs sit on bank boards. Notably, in the last two columns and for both types of directors, I do not find any effect when I use stock returns as a measure of bank performance. This is not entirely surprising as the literature suggests that accounting profitability is the primary indicator used by boards to make retention decisions (Srivastav et al., 2014; Weisbach, 1988).

Overall, the presence of outside CEO directors from financial firms on bank boards increases the effectiveness of board monitoring. The results, at least for outside CEOs from financial firms, therefore, are different from Faleye (2011) who reports suboptimal CEO compensation when a CEO director is present on the board and from Fahlenbrach et al. (2010) who report no effect of outside CEOs on compensation and turnovers after controlling for firm fixed effects. Both studies do not focus on banks and, more importantly, do not account for the industry of the primary firm of the outside CEO director.

3.8 Implications of the Appointment for the Outside CEO Firm

The analysis indicates that not all outside CEO directors offer the same contribution to bank boards. In particular, it appears that the appointment of outside CEOs from non-financial firms are followed by lending practices that are not beneficial for the appointing bank. This raises the possibility that for these CEOs the bank board memberships are primarily used as a way to benefit their firm. More precisely, the appointment of a CEO onto a bank board is expected to give better access to the credit markets (Perry and Peyer, 2005) with an increase in the bank debt of the appointed CEO firm. To understand the validity of this conjecture I examine the post-appointment business implications for the

outside CEO firms, focusing on the evolution of the bank debt-to-total assets ratio of the outside CEO director firm post-appointment.[20]

More controversial is whether this potential increase in lending following the appointment is beneficial for the performance of the outside CEO firm. On the one hand, agency theory scholars take the view that outside directorships distract CEOs and this has a negative effect on firm profitability and risk (Useem, 1979; Yermack, 2004). In contrast, another group of scholars argue outside directorships give CEOs additional access to information and strategic resources which may help them to increase the long-term performance of their firms (Haunschild, 1993; Geletkanycz and Hambrick, 1997; Kor and Sundaramurthy, 2009). To understand which interpretation applies to the sample I examine the evolution of profitability and tail risk of the outside CEO firms post-appointment.

Insert Table 3-10 here

The results in panel A of Table 3-10 show that when their CEOs are appointed onto a bank board, both financial and non-financial firms experience a significant increase in bank debt. This increase is, however, larger for non-financial firms. Panel B of Table 3-10 shows that the increase in bank debt is accompanied by an improvement in (industry-adjusted) profitability for both financial and non-financial CEO firms; this increase again being larger for non-financial firms. Finally, Panel C shows an increase in the industry-

[20] Due to data limitations, the sample only includes public firms. The total number of public firm CEO director appointments, after filtering for appointments with multiple announcements is 128, of which, 86 are financial firm CEO director appointments and 42 are non-financial firm CEO directors' appointments.

adjusted tail risk of non-financial firms post-appointment of their CEOs onto bank boards, while there is no effect for financial firms.

Overall, the results in this section highlight that the benefit of sitting on bank boards materializes for CEO directors who are managing non-financial firms, whereas financial firms achieve less benefit when their CEOs are appointed onto bank boards.

3.9 Conclusions

I extend the literature on the role of outside CEOs in firm boards by showing the matching between these directors and bank boards depends on the potential synergies between a bank's business model and the industry of the outside CEO. In particular, I find that outside ceo from financial firms are more likely to match with banks with a less traditional business focus and outside CEOs from non-financial firms with lending-focused banks.

The shareholder perception of who benefits from this matching is different for the two types of outside CEOs. In the case of bank shareholders, only the appointment of CEOs from financial firms leads to larger abnormal returns around the appointment day as compared to other director appointments. In contrast, the appointment of CEO directors from non-financial firms is perceived by these shareholders as being less valuable than the appointment of non-CEO independent directors that are currently employed in financial firms. Nevertheless, for the shareholders of the outside CEO firm, the value of the board membership is larger for non-financial firms and especially when the appointment occurs in a bank with a greater focus on lending. Generally, these findings are consistent with the view that the firm of the outside CEO expects benefits in terms of credit access from the board membership.

I next show that the highlighted differences in the value assigned to the appointment are reflected in how the advising and monitoring quality of a bank board evolves post the appointment of an outside CEO. In terms of advising quality, I observe that, in contrast to recent evidence for non-financial firms (Fahlenbrach et al., 2010), a simple certification effect does not explain the more positive bank shareholder reaction when CEOs from financial firms are appointed onto the board. In fact, the appointment of these directors is followed by an increase in non-interest-based income activities, a reduction in lending and these changes benefit the appointing banks in terms of profitability and risk-exposure. In contrast, the appointment of CEO directors from non-financial firms strengthens a bank's business focus on lending but this results in an increase in risk without any significant changes in profitability.

A similar picture is offered by the analysis on the effectiveness of bank board monitoring. I consistently find that only the presence of CEO directors from financial firms increases the sensitivity of bank CEO compensation and CEO turnover to bank performance. Along these lines, additional tests highlight that the non-financial firms of the outside CEOs, and not the appointing banks, benefit from the appointment.

To sum up, two key conclusions emerge from the study. First, the appointment of CEOs of financial firms onto bank boards is explained by a performance effect that sees the appointment as being motivated by the monitoring and advising quality provided by these directors. Second, while the appointment of a CEO from a non-financial firm does not seem to provide particular benefits for the shareholders of the appointing bank, the primary firm of the outside CEO does obtain relevant benefits.

Table 3–1: Distribution of Director Appointments

The Table shows the distribution of director appointments by category. The sample period ranges from 2001 to 2014 and the total number of appointments is equal to 3420. The percentage is calculated as the ratio of the total number of appointments in each category to total appointments in a given year.

Year	Total Appointments	Independent CEO Directors		Other Independent Directors			Insiders	Total
		Financial Firm	Non-Financial Firm	Financial Firm	Non-Financial Firm	No Industry		
2001	133	4.51%	5.26%	28.57%	15.04%	3.01%	43.61%	100.00%
2002	109	3.67%	7.34%	33.94%	28.44%	0.92%	25.69%	100.00%
2003	192	1.56%	4.69%	33.85%	34.38%	2.60%	22.92%	100.00%
2004	315	8.25%	7.94%	35.87%	25.40%	3.81%	18.73%	100.00%
2005	302	5.30%	6.62%	34.77%	33.11%	1.99%	18.21%	100.00%
2006	309	6.47%	5.50%	35.60%	29.13%	4.21%	19.09%	100.00%
2007	292	8.90%	5.14%	34.25%	27.05%	0.68%	23.97%	100.00%
2008	255	8.63%	4.31%	29.80%	29.80%	3.92%	23.53%	100.00%
2009	227	5.29%	1.76%	40.53%	28.19%	1.76%	22.47%	100.00%
2010	247	6.88%	5.26%	41.70%	23.89%	4.05%	18.22%	100.00%
2011	269	5.95%	1.86%	46.84%	24.16%	4.46%	16.73%	100.00%
2012	241	6.22%	4.15%	40.25%	25.31%	1.66%	22.41%	100.00%
2013	245	7.35%	1.22%	44.08%	24.49%	3.27%	19.59%	100.00%
2014	284	7.75%	1.41%	54.58%	16.55%	2.82%	16.90%	100.00%
Total	3420	6.52%	4.42%	38.74%	26.26%	2.89%	21.17%	100.00%

Table 3–2: Summary Statistics

The Table shows the definitions of and the summary statistics for the explanatory variables employed in the analysis. Panels A and B report values for the period 2000 – 2013 (excluding the variable "TARP Bank"). Panel C reports values for the period 2001-2014.

	Description	N	Mean	Median	SD	p1	p99
Panel A: Governance Variables							
Board Independence	Total number of independent directors divided by total board members	3,420	0.741	0.750	0.132	0.037	0.933
CEO Directors on the Board	Total number of directors who are current CEOs divided by total board members	3,420	0.068	0.053	0.071	0.000	0.041
Board Financial Expertise	Ratio between the number of financial experts to number of independent directors	3,420	0.488	0.500	0.270	0.101	0.882
Board Age	Log of average board age	3,420	4.105	4.105	0.061	3.938	4.260
Board Size	The log transformation of the total number of board members	3,420	2.508	2.484	0.284	1.791	3.135
CEO Duality	Dummy variable equal to 1 if the CEO is also the chairman of the board	3,420	0.470	0.000	0.499	0.000	1.000
CEO Age	Log of bank CEO Age	3,420	4.025	4.026	0.129	3.688	4.317
Panel B: Bank Fundamentals							
Net Loans	The ratio between net loans to total assets	3,420	0.658	0.670	0.125	0.252	0.888
Non-Interest Income	The ratio of non-interest income divided by non-interest income plus net interest income.	3,420	0.264	0.243	0.143	0.021	0.673
Growth Opportunities	The log transformation of the market to book ratio	3,420	0.166	0.245	0.613	-1.826	1.355
Profitability	The ratio of earnings before interest and tax to total assets	3,420	0.006	0.008	0.013	-0.046	0.020
Size	The log transformation of total assets measured in millions of US dollars	3,420	7.503	7.216	1.517	4.846	12.637
Tier I Ratio	The ratio between Tier 1 regulatory capital and Risk Weighted Assets	3,420	0.119	0.114	0.058	0.062	0.212
Tail Risk	Average bank daily stock returns in the lowest 5% percentile of the yearly distribution	3,420	0.052	0.040	0.036	0.020	0.183
TARP Bank	Dummy variable equal to 1 for the years bank remained in the TARP program.	3,420	0.324	0.000	0.468	0.000	1.000
Panel C: Banking Environment							
Financial Crisis	Dummy variable equal to 1 for the period 2007-2009	3,420	0.210	0.000	0.407	0.000	1.000
Post Dodd-Frank Act	Dummy variable equal to 1 for the period 2011-2014	3,420	0.394	0.000	0.488	0.000	1.000

Table 3–3: Determinants of Director Appointments on Bank Boards

The Table reports estimates from multinomial logit regressions of the determinants of director appointments. Director appointments are classified into five categories. Specifically, the dependent variable is equal to 0 if an insider director is appointed onto the board: 1 in the case of a non-financial firm CEO independent director appointment: 2 if a financial firm CEO independent director is appointed; 3 in the case of a non-financial non-CEO independent director appointment; 4 if a financial firm non-CEO independent director is appointed; 5 if the appointed independent directors are from non-industrial sectors. The base outcome is 0 for an insider director appointment. **Net Loans** is the ratio between net loans to total assets. **Non-Interest Income** is the ratio of non-interest income divided by non-interest income plus net interest income. **Board Independence** is the ratio between the total number of independent directors and total board members. **CEO Directors on the Board** is the ratio between the total number of directors who are current CEOs and total board members. **Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Age** is the log of the average age of the board members. **Board Size** is the log transformation of the total number of board members. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Age** is the log age of the bank CEO. **Growth Opportunities** is the log transformation of the market to book ratio. **Profitability** is the ratio between earnings before interest and tax to total assets. **Size** is the log transformation of total assets measured in millions of US dollars. **Tier I Ratio** is the ratio between Tier 1 regulatory capital and Risk Weighted Assets. **Tail Risk** is the average bank daily stock returns in the lowest 5% percentile of the yearly distribution. **TARP Bank** is a dummy variable equal to 1 for the years bank remained in the TARP program. **Financial Crisis** is a dummy variable equal to one for the period 2007-2009. **Post-Dodd-Frank Act** is a dummy variable equal to one for the period 2011-2014. All board and accounting variables are lagged one year. All accounting variables are winsorized at the 1 – 99 level. Robust standard errors clustered at the bank level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Independent CEO Directors		**Other Independent Directors**		
	Financial Firm	**Non-Financial Firm**	**Financial Firm**	**Non-Financial Firm**	**Non-Industry**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Net Loans $_{t-1}$	0.664	2.398**	0.741	1.020*	1.695
	(1.172)	(1.021)	(0.688)	(0.593)	(1.321)
Non-Interest Income $_{t-1}$	0.730**	-0.488	-0.034	-0.032	0.067
	(0.364)	(0.455)	(0.260)	(0.283)	(0.383)
Board Independence$_{t-1}$	-0.011*	-0.005*	-0.005*	-0.006	0.007
	(0.005)	(0.002)	(0.002)	(0.006)	(0.013)
CEO Directors on the board $_{t-1}$	-1.764**	-0.621	-0.510*	-0.756*	0.379
	(0.885)	(0.856)	(0.241)	(0.320)	(1.081)
Board Financial Expertise $_{t-1}$	-0.103	-0.447**	-0.027	-0.263*	-0.205
	(0.236)	(0.222)	(0.137)	(0.147)	(0.272)
Board Age $_{t-1}$	0.021*	-0.002**	0.047***	0.035***	0.032*
	(0.013)	(0.000)	(0.008)	(0.008)	(0.017)
Board Size $_{t-1}$	-0.145	0.685***	-0.105	-0.154*	0.213
	(0.225)	(0.247)	(0.138)	(0.071)	(0.293)
CEO Duality $_{t-1}$	0.362*	0.196	0.243*	0.287**	0.223
	(0.207)	(0.238)	(0.134)	(0.139)	(0.254)
CEO Age $_{t-1}$	-0.050***	-0.067***	-0.054***	-0.059***	-0.047**
	(0.016)	(0.018)	(0.011)	(0.012)	(0.024)
Growth Opportunities $_{t-1}$	0.075	0.971***	0.264**	0.010	0.501**
	(0.209)	(0.263)	(0.128)	(0.136)	(0.250)
Profitability $_{t-1}$	-19.930**	8.617	-2.219	3.097**	17.080*
	(8.425)	(9.511)	(5.668)	(1.274)	(8.811)
Size $_{t-1}$	0.028	-0.044	0.057**	0.039*	0.009**
	(0.057)	(0.101)	(0.020)	(0.018)	(0.003)
Tier I Ratio $_{t-1}$	-0.011	-0.081***	0.017**	-0.013	0.056*
	(0.018)	(0.002)	(0.008)	(0.013)	(0.020)
Tail Risk $_{t-1}$	-5.846	-7.121*	-4.096	-7.446**	0.835
	(4.596)	(3.471)	(3.220)	(3.241)	(5.320)
TARP Bank $_{t}$	-0.283	-0.229	0.144	0.122	0.340
	(0.233)	(0.262)	(0.152)	(0.147)	(0.300)
Financial Crisis $_{t}$	1.643**	2.000***	1.415***	2.004***	1.358
	(0.753)	(0.746)	(0.449)	(0.523)	(0.875)

Table 3-3: Determinants of Director Appointments on Bank Boards (Continued)

The Table reports estimates from multinomial logit regressions of the determinants of director appointments. Director appointments are classified into five categories. Specifically, the dependent variable is equal to 0 if an insider director is appointed onto the board: 1 in the case of a non-financial firm CEO independent director appointment: 2 if a financial firm CEO independent director is appointed; 3 in the case of a non-financial non-CEO independent director appointment; 4 if a financial firm non-CEO independent director is appointed; 5 if the appointed independent directors are from non-industrial sectors. The base outcome is 0 for an insider director appointment. **Net Loans** is the ratio between net loans to total assets. **Non-Interest Income** is the ratio of non-interest income divided by non-interest income plus net interest income. **Board Independence** is the ratio between the total number of independent directors and total board members. **CEO Directors on the Board** is the ratio between the total number of directors who are current CEOs and total board members. **Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Age** is the log of the average age of the board members. **Board Size** is the log transformation of the total number of board members. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Age** is the log age of the bank CEO. **Growth Opportunities** is the log transformation of the market to book ratio. **Profitability** is the ratio between earnings before interest and tax to total assets. **Size** is the log transformation of total assets measured in millions of US dollars. **Tier I Ratio** is the ratio between Tier 1 regulatory capital and Risk Weighted Assets. **Tail Risk** is the average bank daily stock returns in the lowest 5% percentile of the yearly distribution. **TARP Bank** is a dummy variable equal to 1 for the years bank remained in the TARP program. **Financial Crisis** is a dummy variable equal to one for the period 2007-2009. **Post-Dodd-Frank Act** is a dummy variable equal to one for the period 2011-2014. All board and accounting variables are lagged one year. All accounting variables are winsorized at the 1 – 99 level. Robust standard errors clustered at the bank level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Financial Firm (1)	**Non-Financial Firm (2)**	**Financial Firm (3)**	**Non-Financial Firm (4)**	**Non-Industry (5)**
Post Dodd-Frank Act $_t$	1.542**	0.625	2.110***	1.398***	1.470*
	(0.672)	(0.918)	(0.358)	(0.484)	(0.801)
Observations	3,420				
Pseudo R^2	0.041				
Year Fixed Effects	Yes				

Table 3–4: Bank Shareholder Reaction to Outside CEO Director Appointments

The Table reports abnormal returns on the appointment of financial and non-financial CEO directors and other directors (insider and independent directors). The total number of appointments, including CEO and other directors after filtering for appointments with multiple announcements, is 1,503 of which 230 are CEO director appointments (financial firm CEO director appointments is 172 and non-financial firm CEO director appointments is 58), other independent director appointments is 896 (financial firms independent director appointments is 536 and non-financial firm independent director appointments is 360) and insider appointments is 377. I calculated abnormal returns based on a market model using an equal-weighted CRSP market portfolio, where the model parameters α and β are estimated over an estimation window of 1 year prior to the event date. I calculate abnormal returns for a 3-day event window [-1 day, 0 = Event day, +1 day] where 0 is the director's appointment announcement day. Panel A reports the difference in CARs on the appointment of CEO directors from financial and non-financial firms. Panel B shows the CAR difference between the financial firm CEO director appointments and non-financial firm CEO director appointments. Panel C, reports a similar analysis based on the difference between non-financial firm CEO director appointments and non-financial firm other independent director appointments. Panel D, reports the difference in CARs on the appointment of non-financial firm other directors and financial firm other independent directors. Finally, Panel E reports regression results from the multivariate analysis of the determinants of abnormal returns generated by directors' appointment onto bank boards. The model in panel E columns (1) is estimated via OLS and the model in panel E columns (2) via median regression. The models in column (1) and (2) includes the full set of control variables. Robust standard errors are reported in parentheses. The Significance in the difference between the mean and median values of the two groups is determined by a two-sample t-test and a Wilcoxon signed rank test respectively. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

Panel A: Financial Firm CEO Directors (172) vs. Non-Financial Firm CEO Directors (58)			
Mean CAR	0.520	0.083	0.437**
Median CAR	0.473	0.000	0.473***
Panel B: Financial Firm CEO Directors (172) vs. Financial Firm Other Independent Directors (536)			
Mean CAR	0.520	0.275	0.245**
Median CAR	0.473	0.000	0.473***
Panel C: Non-Financial Firm CEO Directors (58) vs. Non-Financial Firm Other Independent Directors (360)			
Mean CAR	0.083	0.071	0.012
Median CAR	0.000	0.000	0.000
Panel D: Financial Firm Other Independent Directors (536) vs. Non-Financial Firm CEO Directors (58)			
Mean CAR	0.275	0.083	0.192*
Median CAR	0.000	0.000	0.000

Panel E: Market Reaction and CEO Director Appointments: Multivariate Analysis

	Mean CAR (1)	**Median CAR (2)**
Financial Firm CEO Directors $_0$	0.015***	0.038***
	(0.003)	(0.010)
Non-Financial Firm CEO Directors $_0$	0.008	0.007
	(0.006)	(0.005)
Financial Firm Other Independent Directors $_0$	0.007**	0.022*
	(0.003)	(0.010)
Non-Financial Firm Other Independent Directors $_0$	0.006	0.011
	(0.004)	(0.009)
Observations	1,503	1,503
Adj-R^2	0.031	
Pseudo- R^2		0.051
Year Fixed Effects	Yes	Yes

Table 3–5: The Market Reaction of Outside CEO Shareholders

The Table reports market reaction for the parent company of financial and non-financial CEO directors on their appointment announcements. The total number of public firm CEO director appointments, after filtering for appointments with multiple announcements, is 128 of which 86 are financial firm CEO director appointments and 42 are non-financial firm CEO directors' appointments. Panel A provides results for the abnormal returns of CEO company around the appointment of CEO based on the sector of the firm. Panel B provides differences in parent company market reaction on the appointment of financial and non-financial CEO directors based on samples of banks that are above and below the sample net loans median. Out of 86 financial firm CEO directors appointments, 54 appointments were being made with banks that have below median net loans and the remaining 32 appointed financial firm CEO directors joined banks with above median net loans. Where out of 42 non-financial firm CEO directors appointments, 18 were appointed in banks with below median net loans and the remaining 24 were appointed in banks that have above median net loans. Panel C reports the abnormal returns of parent company market reaction on the appointment of financial and non-financial CEO directors based on a sample of banks' that are above and below the sample non-interest income median. Out of 42 non-financial firm CEO directors appointments, 33 were appointed in banks with below median non-interest income and the remaining 9 were appointed in banks that have above median non-interest income. Where out of 86 financial firm CEO director appointments, 59 appointments were being made in banks that have below median net loans and the remaining 27 appointed financial firm CEO directors joined banks with above median net loans. I calculated abnormal returns based on a market model using an equal-weighted CRSP market portfolio, where the model parameters α and β are estimated over an estimation window of 1 year prior to the event date. I calculate abnormal returns for a 3-day event window [-1 day, 0 = Event day, +1 day] where 0 is the director's appointment announcement day. Column (3) reports the difference between the financial (column (1)) and non-financial (column (2)) CEO parent company CARSs. Significance in the difference between the mean and median values of the two groups is determined by a two-sample t-test and a Wilcoxon signed rank test respectively. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

Panel A: CEO Parent Company Market Reaction

	Financial Sector CEO (1)	**Non-Financial Sector CEO (2)**	**Difference (3)** (2)– (1)
Mean CAR	0.001	0.073***	0.072*
Median CAR	0.000	0.037**	0.037**

Panel B: Market Reaction based on Lending Activity

	Net Loans > Median (1)	**Net Loans < Median (2)**	**Difference (3) (1) – (2)**
Financial Sector Mean CAR	0.011	0.004	0.007
Financial Sector Median CAR	0.000	0.000	0.000
Non-Financial Sector Mean CAR	0.020***	0.014***	0.006***
Non-Financial Sector Median CAR	0.020**	0.014*	0.006**

Panel C: Market Reaction based on Non-Interest Income

	Non-Interest Income > Median (1)	**Non-Interest Income < Median (2)**	**Difference (3) (1) – (2)**
Financial Sector Mean CAR	0.054	0.030	0.024
Financial Sector Median CAR	0.051	0.036	0.015
Non-Financial Sector Mean CAR	0.019	0.027	-0.008
Non-Financial Sector Median CAR	0.000	0.010	-0.010

Table 3–6: Outside CEO Director Appointment and Effects on Business Models, Performance and Risk: Univariate Analysis

Panel A presents results for the changes in a bank's business model around director appointments. The change in the business model is defined by the change in the industry adjusted ratio between total loans and total assets ratio (Δ**Loans**), and the industry adjusted non-interest income (ratio is the ratio of non-interest income divided by non-interest income plus net interest income (**Δ Non-Interest Income**). Panel B shows results for changes in bank industry adjusted performance and risk defined as (**Δ Profitability**) and (**Δ Tail Risk**), respectively. I use a univariate analysis and consider banks that appoint at least one CEO director as the treatment group, where the control group includes banks that appoint: 1) at least one non-CEO independent director (column (1)); 2) at least one financial firm non-CEO director (column (2)); 3) at least one non-financial firm CEO director (column (3)). In columns (4) and (5) the treatment group includes banks with at least one non-financial firm CEO director appointment where banks appointing at least one non-CEO independent director (column (4)) or a non-financial firm other independent directors (column (5)) are used as control groups. I calculate the variables before the appointment as the average over the years -2 and -3 before the appointment, while I calculate the values after the appointment as the average over the period ranging from t+1 to t+3. The third row of each panel reports the difference in the two values. A two-sample t-test is used to determine whether the means of different types of CEO directors are significantly different from zero. Where *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Financial Firm CEO Directors vs.			**Non-Financial Firm CEO Directors vs.**	
	Other Independent Directors	**Financial Firm Other Independent directors**	**Non-Financial Firms CEO Directors**	**Other Independent Directors**	**Non-Financial Firm Other Independent Directors**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Panel A: Business Model					
Δ Loans					
Before (Treated vs. Control)	0.039	0.077**	0.022**	0.010**	0.016
After (Treated vs. Control)	-0.018	-0.013*	0.010***	0.022*	0.020**
Difference (Treated vs. Control)	-0.057**	-0.090*	-0.012***	0.012***	0.004**
Δ Non-Interest Income					
Before (Treated vs. Control)	0.138*	0.108*	0.103***	0.070	-0.049
After (Treated vs. Control)	0.150***	0.169***	0.117***	0.076	-0.058
Difference (Treated vs. Control)	0.012***	0.061**	0.014***	0.006	-0.009
Panel B: Bank Performance and Risk					
Δ Profitability					
Before (Treated vs. Control)	0.009	0.012***	-0.052***	0.198***	-0.461**
After (Treated vs. Control)	0.023**	0.031***	0.005	0.201***	-0.006
Difference (Treated vs. Control)	0.014***	0.019***	0.057***	0.003	-0.0062
Δ Tail Risk					
Before (Treated vs. Control)	0.137***	0.144	-0.075*	-0.139*	-0.105*
After (Treated vs. Control)	0.090***	0.092***	-0.128*	-0.097*	-0.072*
Difference (Treated vs. Control)	-0.047**	-0.052***	-0.053**	0.042***	0.033**

Table 3–7: Director Appointments and Effects on Business Models, Performance and Risk (OLS, and 2SLS)

The Table reports estimates of the effect of director appointments on business models, performance and risk using OLS and 2SLS regression in Panel A columns (1) to (4) and Panel B columns (5) to (10), respectively. I compare the change in the industry adjusted total loans to total assets (**ΔLoans**) ratio, and non-interest income divided by non-interest income plus net interest income (**Δ Non-Interest Income**), industry-adjusted Profitability (**Δ Profitability**) and Tail Risk (**Δ Tail Risk**) before and after the appointment of financial and non-financial firm CEO directors onto bank boards. I treat the appointment of CEO directors as exogenous and employ two instruments. **Financial Firms to Total Employment** is the number of financial firms in the state where a bank's headquarters is located scaled by the total employed population of the state. This instrument is expected to be positively related to the probability of appointing an outside CEO from a financial firm. **Non-Financial Firms to Total Employment** is the number of non-financial firms in the state where a bank's headquarters is located scaled by the total employed population of the state. This instrument is expected to be positively related to the probability of appointing an outside CEO from a non-financial firm. **Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a financial firm at time *t*, **Non-Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a non-financial firm at time *t*. Following Fahlenbrach et al. (2010), I use the period from t-2 to t-3 to calculate the pre-appointment average value of each variable and the period from t+1 to t+3 to measure the post-appointment average values. **Board Independence** is the ratio between a total number of independent directors and total board members. **CEO Directors** on the Board is the ratio between the total number of directors who are current CEOs and total board members. **Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Size** is the log transformation of the total number of board members. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Age** is the log age of the bank CEO. **Size** is the log transformation of total assets measured in millions of US dollars. **Financial Crisis** is a dummy variable equal to 1 for the period 2007-2009. **Post-Dodd-Frank Act** is a dummy variable equal to 1 for the period 2011-2014. The control variables are measured at time *t-1*. Robust standard errors clustered at the bank level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Panel A: OLS Regression				**Panel B: 2SLS Regression**					
					First Stage Regressions		**Second Stage Regressions**			
	Business Models		**Performance**		**Financial Firm CEO Directors**	**Non-Financial Firm CEO Directors**	**Business Models**		**Performance and Risk**	
	ΔLoans	**Δ Non-Interest Income**	**ΔProfitability**	**ΔTail Risk**			**ΔLoans**	**Δ Non-Interest Income**	**ΔProfitability**	**ΔTail Risk**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Financial Firm CEO Directors $_{t}$	-0.007**	0.018***	0.083**	-0.041**			-0.124	0.017***	0.316***	-0.111***
	(0.003)	(0.003)	(0.039)	(0.019)			(0.138)	(0.003)	(0.025)	(0.040)
Non-Financial Firm CEO Directors $_{t}$	0.015**	0.019	0.036	0.044*			0.337**	0.155	0.015	0.106**
	(0.006)	(0.015)	(0.031)	(0.021)			(0.160)	(0.111)	(0.031)	(0.040)
Financial Firms to Total Employment $_{t-1}$					0.945***	-0.323				
					(0.000)	(0.353)				
Non-Financial Firms to Total Employment $_{t-1}$					-0.302	1.633***				
					(0.739)	(0.619)				
Board Independence $_{t-1}$	0.070***	-0.001**	-0.010	0.002**	0.003***	0.002***	0.078**	-0.009***	-0.014	0.001*
	(0.004)	(0.000)	(0.018)	(0.001)	(0.000)	(0.000)	(0.033)	(0.002)	(0.016)	(0.000)

Table 3-7: Director Appointments and Effects on Business Models, Performance and Risk (OLS, and 2SLS) (Continued)

	Panel A: OLS Regression				Panel B: 2SLS Regression					
					First Stage Regressions		Second Stage Regressions			
	Business Models		Performance		Financial Firm CEO Directors	Non-Financial Firm CEO Directors	Business Models		Performance and Risk	
	ΔLoans	Δ Non-Interest Income	ΔProfitability	ΔTail Risk			ΔLoans	Δ Non-Interest Income	ΔProfitability	ΔTail Risk
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CEO Directors on the board $_{t-1}$	0.183	0.577	0.578	-0.096	0.201	-0.160	0.235	0.560	0.516	-0.082***
	(0.120)	(0.545)	(1.017)	(0.123)	(0.245)	(0.171)	(0.185)	(0.645)	(0.830)	(0.030)
Board Financial Expertise $_{t-1}$	0.012**	0.053**	0.295*	0.300	-0.123***	-0.083***	0.002*	0.048***	0.221**	0.273
	(0.007)	(0.024)	(0.145)	(0.336)	(0.008)	(0.007)	(0.001)	(0.008)	(0.113)	(0.175)
Board Size $_{t-1}$	0.010	-0.016**	-0.011	-0.005**	-0.003*	0.001	0.017	-0.013***	-0.029	-0.004***
	(0.009)	(0.006)	(0.033)	(0.003)	(0.002)	(0.002)	(0.022)	(0.003)	(0.027)	(0.001)
CEO Duality $_{t-1}$	-0.001**	0.059**	0.367	-0.006**	0.004	0.024***	-0.004**	0.026***	0.785***	-0.007**
	(0.008)	(0.024)	(0.286)	(0.002)	(0.013)	(0.010)	(0.002)	(0.008)	(0.173)	(0.003)
CEO Age $_{t-1}$	-0.013	0.047*	0.085	-0.058	0.110***	0.077***	-0.022	0.033*	0.043	-0.047
	(0.009)	(0.024)	(0.079)	(0.101)	(0.004)	(0.003)	(0.017)	(0.019)	(0.031)	(0.037)
Size $_{t-1}$	0.004***	0.133***	0.061**	-0.035	0.023	0.008***	0.007***	0.147***	0.053**	-0.012
	(0.002)	(0.026)	(0.031)	(0.022)	(0.008)	(0.001)	(0.001)	(0.007)	(0.026)	(0.013)
Financial Crisis $_{t}$	-0.017**	-0.414***	0.065	-0.022	0.035**	-0.009	-0.022***	-0.187***	0.039	-0.018**
	(0.009)	(0.091)	(0.684)	(0.071)	(0.012)	(0.011)	(0.009)	(0.052)	(0.048)	(0.009)
Post Dodd-Frank Act $_{t}$	0.037**	-0.391***	0.012**	-0.016	0.004	0.013**	0.033***	-0.173***	0.089***	-0.027
	(0.013)	(0.092)	(0.006)	(0.090)	(0.011)	(0.002)	(0.013)	(0.059)	(0.008)	(0.021)
Constant	0.018**	0.486*	0.769	0.469**	0.083**	-0.073***	3.032***	0.804***	-1.014	0.015
	(0.008)	(0.275)	(1.175)	(0.194)	(0.016)	(0.018)	(0.626)	(0.080)	(0.780)	(0.028)
Observations	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared					0.036	0.031				
Adj-R^2	0.027	0.126	0.041	0.027						
Hansen J (P-Value)							0.888	0.418	0.619	0.501

Table 3–8: Director Appointments and Effects on Business Models, Performance and Risk (JIVE, and Fixed Effects)

The Table reports estimates of the effect of director appointments on business models, performance and risk using a Jackknife Instrumental Variables regression and Fixed Effects regression in Panel A columns (1) to (4) and Panel B Columns (5) to (8), respectively. For the Jackknife Instrumental Variables regression I use the STATA user-written program "JIVE" and use the option "jive1" as suggested by Angrist, Imbens, and Krueger, (1999). I compare the change in the industry adjusted total loans to total assets **(ΔLoans**) ratio, and non-interest income divided by non-interest income plus net interest income **(Δ Non-Interest Income**). Panel B compares the change in the industry adjusted Profitability (**Δ Profitability**) and Tail Risk (**Δ Tail Risk**) before and after the appointment of financial and non-financial firm CEO directors onto bank boards. In Panel A **Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a financial firm at time *t*, **Non-Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a non-financial firm at time *t*. Following Fahlenbrach et al. (2010) I use the period from t-2 to t-3 to calculate the pre-appointment average value of each variable and the period from t+1 to t+3 to measure the post-appointment average values. Panel B reports results from the Fixed Effects regressions. The dependent variables used in the fixed effects regressions are unadjusted. The $\boldsymbol{Post\_FINCEO_{i,t}}$ is the dummy variable that takes the value of one in the post appointment period (3 year) of the financial firm CEO directors, $\boldsymbol{Post\_NonFinCEO_{i,t}}$ is a dummy variable that takes a value of one for the 3 years following the appointment of non-financial firm CEO director. Board Independence is the ratio between the total number of independent directors and the total number of board members. **CEO Directors on the Board** is the ratio between the total number of directors who are current CEOs and total board members**. Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Size** is the log transformation of the total number of board members**. CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Age** is the log age of the bank CEO. **Size** is the log transformation of total assets measured in millions of US dollars. **Financial Crisis** is a dummy variable equal to 1 for the period 2007-2009. **Post Dodd-Frank Act** is a dummy variable equal to 1 for the period 2011-2014. The control variables are measured at time *t-1*. Robust standard errors clustered at the bank level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Panel A: Jackknife Instrumental Variables Regression (JIVE1)				**Panel B: Fixed Effects Regression**			
	ΔLoans	**Δ Non-Interest Income**	**ΔProfitability**	**ΔTail Risk**	**Loans**	**Non-Interest Income**	**Profitability**	**Tail Risk**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Financial Firm CEO Directors *t*	-0.027*	0.217***	0.166*	-0.054***				
	(0.013)	(0.081)	(0.988)	(0.007)				
Non-Financial Firm CEO Directors *t*	0.030***	0.361	0.633	0.060				
	(0.009)	(0.261)	(0.720)	(0.129)				
$Post\_FINCEO_{i,t}$					-0.011*	0.042**	0.002**	-0.001*
					(0.006)	(0.020)	(0.001)	(0.000)
$Post\_NONFINCEO_{i,t}$					0.002**	0.033	0.001	0.002
					(0.003)	(0.038)	(0.001)	(0.002)
Board Independence *t-1*	-0.012	0.022***	-0.000	0.002	-0.044*	0.014	-0.001	0.003
	(0.022)	(0.006)	(0.000)	(0.086)	(0.022)	(0.181)	(0.003)	(0.003)
CEO Directors on the board *t-1*	-0.006	0.036***	-0.000	-0.001	-0.018*	0.062	-0.000	-0.000
	(0.004)	(0.012)	(0.000)	(0.009)	(0.009)	(0.051)	(0.001)	(0.000)
Board Financial Expertise *t-1*	0.001	0.004***	0.000	0.063	0.001	0.001	0.000	0.001
	(0.002)	(0.000)	(0.000)	(0.064)	(0.006)	(0.005)	(0.001)	(0.001)
Board Size *t-1*	0.004	-0.051***	-0.003	-0.927***	0.001	-0.000	-0.000	-0.000
	(0.006)	(0.017)	(0.003)	(0.309)	(0.001)	(0.001)	(0.000)	(0.000)
CEO Duality *t-1*	-0.003***	0.002	0.000**	-0.035	-0.008	0.006	0.006	-0.004
	(0.001)	(0.002)	(0.000)	(0.034)	(0.006)	(0.006)	(0.006)	(0.001)

Table 3-8: Director Appointments and Effects on Business Models, Performance and Risk (JIVE, and Fixed Effects) (Continued)

The Table reports estimates of the effect of director appointments on business models, performance and risk using a Jackknife Instrumental Variables regression and Fixed Effects regression in Panel A columns (1) to (4) and Panel B Columns (5) to (8), respectively. For the Jackknife Instrumental Variables regression I use the STATA user-written program "JIVE" and use the option "jive1" as suggested by Angrist, Imbens, and Krueger, (1999). I compare the change in the industry adjusted total loans to total assets **(ΔLoans**) ratio, and non-interest income divided by non-interest income plus net interest income **(Δ Non-Interest Income**). Panel B compares the change in the industry adjusted Profitability (**Δ Profitability**) and Tail Risk (**Δ Tail Risk**) before and after the appointment of financial and non-financial firm CEO directors onto bank boards. In Panel A **Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a financial firm at time *t*, **Non-Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a non-financial firm at time *t*. Following Fahlenbrach et al. (2010) I use the period from t-2 to t-3 to calculate the pre-appointment average value of each variable and the period from t+1 to t+3 to measure the post-appointment average values. Panel B reports results from the Fixed Effects regressions. The dependent variables used in the fixed effects regressions are unadjusted. The $\boldsymbol{Post\_FINCEO_{i,t}}$ is the dummy variable that takes the value of one in the post appointment period (3 year) of the financial firm CEO directors, $\boldsymbol{Post\_NonFinCEO_{i,t}}$ is a dummy variable that takes a value of one for the 3 years following the appointment of non-financial firm CEO director. Board Independence is the ratio between the total number of independent directors and the total number of board members. **CEO Directors on the Board** is the ratio between the total number of directors who are current CEOs and total board members**. Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Size** is the log transformation of the total number of board members**. CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Age** is the log age of the bank CEO. **Size** is the log transformation of total assets measured in millions of US dollars. **Financial Crisis** is a dummy variable equal to 1 for the period 2007-2009. **Post Dodd-Frank Act** is a dummy variable equal to 1 for the period 2011-2014. The control variables are measured at time *t-1*. Robust standard errors clustered at the bank level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Panel A: Jackknife Instrumental Variables Regression (JIVE1)				**Panel B: Fixed Effects Regression**			
	ΔLoans	**Δ Non-Interest Income**	**ΔProfitability**	**ΔTail Risk**	**Loans**	**Non-Interest Income**	**Profitability**	**Tail Risk**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
CEO Age $_{t-1}$	0.001***	0.005	0.000**	0.003	-0.001	0.003	0.000	0.001
	(0.002)	(0.006)	(0.000)	(0.006)	(0.001)	(0.022)	(0.001)	(0.000)
Size $_{t-1}$	0.005*	-0.037*	-0.003***	0.027***	0.012**	-0.152**	-0.002***	0.007***
	(0.004)	(0.016)	(0.001)	(0.006)	(0.006)	(0.007)	(0.001)	(0.001)
Financial Crisis $_{t}$	0.017	0.027	-0.009***	0.028***	0.057	0.015	-0.011***	0.031***
	(0.008)	(0.021)	(0.001)	(0.002)	(0.052)	(0.000)	(0.000)	(0.000)
Post Dodd-Frank Act $_{t}$	0.089***	0.083***	0.001*	0.004	0.057	0.017*	0.000	0.001
	(0.032)	(0.018)	(0.000)	(0.003)	(0.053)	(0.009)	(0.001)	(0.001)
Observations	2,879	2,879	2,879	2,879	4,497	4,497	4,497	4,497
Bank Fixed Effects					Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.186	0.006	0.238	0.614	Yes	Yes	Yes	Yes

Table 3–9: Outside CEO Directors and Bank CEO Pay-Performance Sensitivity

The Table reports the estimates for the monitoring effect of the presence of outside CEO director on bank boards. Panel A provides estimates for the bank CEO pay-performance sensitivity from fixed effects regressions and the results from the logit regression on CEO turnover sensitivity. The dependent variable in columns (1) and (2) is the log transformation of bank CEO compensation. The dependent variable in columns (3) and (4) is a dummy variable that takes the value of 1 when the CEO of a bank is changed. Panel B shows the marginal effects. The marginal effect can be used to summarize the effect of a unit change in the variable on the probability of an outcome (CEO turnover). The key independent variables are two dummies - **Financial Firm CEO Directors** and **Non-Financial Firm CEO Directors**. Each of the variables takes a value of 1 if at least one director from a given category is present on the board. As I am interested in studying the pay-performance-sensitivity I follow the Aggarwal and Sammick (1999) and Gao and Li (2015) methodology and interact dummy variables with two separate measures of bank performance - **Profitability** and **Stock Returns**. **Board Independence** is the ratio between the total number of independent directors and total board members. **Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Size** is the log transformation of the total number of board members. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Tenure** is the total number of years the chief executive has held the position in the bank. **Tail Risk** is the average bank daily stock returns in the lowest 5% percentile of the yearly distribution. **Profitability** is the ratio between earnings before interest and tax to total assets. **Stock Returns** are (lagged) buy and hold returns measured over the fiscal year. **Size** is the log transformation of total assets measured in millions of US dollars. All variables are lagged one year. Robust standard errors are clustered at the firm level and reported in parentheses. All regressions include year fixed effects. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

Panel A: Regression analysis

	Pay-Performance Sensitivity		**CEO Turnover**	
	Profitability	Stock Returns	Profitability	Stock Returns
	(1)	(2)	(3)	(4)
Financial Firm CEO Directors $_{t-1}$	0.047	0.051	-0.898	-0.089
	(0.034)	(0.048)	(1.048)	(0.648)
Non-Financial Firm CEO Directors $_{t-1}$	0.032	0.027	-0.889	-0.107
	(0.077)	(0.025)	(1.052)	(0.921)
Financial Firm CEO Directors $_{t-1}$*Profitability $_{t-1}$	0.021***		-5.189***	
	(0.006)		(0.977)	
Non-Financial Firm CEO Directors $_{t-1}$*Profitability $_{t-1}$	0.055		3.183	
	(0.043)		(3.390)	
Financial Firm CEO Directors $_{t-1}$*Stock Returns $_{t-1}$		0.019***		-0.047
		(0.003)		(0.148)
Non-Financial Firm CEO Directors $_{t-1}$*Stock Returns $_{t-1}$		0.011		0.141
		(0.008)		(0.199)
Profitability $_{t-1}$	2.131***	1.117***	-1.314***	-2.067***
	(1.008)	(0.097)	(0.133)	(0.212)
Stock Returns $_{t-1}$	0.019*	0.012*	-0.342	-0.349
	(0.011)	(0.007)	(0.343)	(0.343)
Board Independence $_{t-1}$	-0.010*	-0.008**	3.227***	3.224***
	(0.006)	(0.004)	(1.236)	(1.235)
Board Financial Expertise $_{t-1}$	0.043**	0.039*	2.930**	3.030**
	(0.021)	(0.019)	(1.281)	(1.288)
Board size $_{t-1}$	0.033	0.025	-0.634	-0.613
	(0.021)	(0.017)	(0.389)	(0.388)
CEO Duality $_{t-1}$	0.066***	0.057***	-0.655***	-0.652***
	(0.017)	(0.025)	(0.235)	(0.234)
CEO Tenure $_{t-1}$	0.027**	0.017**	6.352***	6.417***
	(0.015)	(0.009)	(1.011)	(1.016)
Tail Risk $_{t-1}$	0.152	0.140	0.864	0.882
	(0.117)	(0.100)	(0.265)	(0.803)
Size $_{t-1}$	0.037***	0.017**	0.115	0.104
	(0.010)	(0.009)	(0.079)	(0.079)
Observations	2,810	2,810	3,578	3,578
Within R^2	0.177	0.130		
Pseudo R^2			0.104	0.109
Bank Fixed Effects	Yes	Yes		
Year Fixed Effects	Yes	Yes	Yes	Yes

Table 3-9: Outside CEO Directors and Bank CEO Pay-Performance Sensitivity (Continued)

The Table reports the estimates for the monitoring effect of the presence of outside CEO director on bank boards. Panel A provides estimates for the bank CEO pay-performance sensitivity from fixed effects regressions and the results from the logit regression on CEO turnover sensitivity. The dependent variable in columns (1) and (2) is the log transformation of bank CEO compensation. The dependent variable in columns (3) and (4) is a dummy variable that takes the value of 1 when the CEO of a bank is changed. Panel B shows the marginal effects. The marginal effect can be used to summarize the effect of a unit change in the variable on the probability of an outcome (CEO turnover). The key independent variables are two dummies - **Financial Firm CEO Directors** and **Non-Financial Firm CEO Directors**. Each of the variables takes a value of 1 if at least one director from a given category is present on the board. As I am interested in studying the pay-performance-sensitivity I follow the Aggarwal and Sammick (1999) and Gao and Li (2015) methodology and interact dummy variables with two separate measures of bank performance - **Profitability** and **Stock Returns**. **Board Independence** is the ratio between the total number of independent directors and total board members. **Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Size** is the log transformation of the total number of board members. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Tenure** is the total number of years the chief executive has held the position in the bank. **Tail Risk** is the average bank daily stock returns in the lowest 5% percentile of the yearly distribution. **Profitability** is the ratio between earnings before interest and tax to total assets. **Stock Returns** are (lagged) buy and hold returns measured over the fiscal year. **Size** is the log transformation of total assets measured in millions of US dollars. All variables are lagged one year. Robust standard errors are clustered at the firm level and reported in parentheses. All regressions include year fixed effects. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Pay-Performance Sensitivity		**CEO Turnover**	
	Profitability	**Stock Returns**	**Profitability**	**Stock Returns**
Panel B: Marginal Effects	(1)	(2)	(3)	(4)
Financial Firm CEO Directors 1			-0.031***	0.037
			(0.006)	(0.034)
Financial Firm CEO Directors 0			0.008	0.035
			(0.008)	(0.033)
Difference: Financial Firm CEO Directors 1 vs 0			**-0.039*** **	**0.002**
Non-Financial Firm CEO Directors 1			0.030	0.043
			(0.020)	(0.046)
Non-Financial Firm CEO Directors 0			0.030	0.035
			(0.033)	(0.031)
Difference: Non-Financial Firm CEO Directors 1 vs 0			**0.000**	**0.008**

Table 3–10: CEO Director Appointment Impact on Parent Company Bank Debt, Profitability and Tail Risk: Univariate Analysis

The Table report results for the business implications for the CEO firm. Panel A reports changes in CEO parent company bank debt ratio around the appointment of their CEO onto a bank board. The change in the bank debt is defined by the change between pre and post appointment CEO director parent company industry adjusted **Bank Debt** ratio calculated as (Term Loans + Revolving Credit / Total assets). Panel B reports changes in CEO parent company **Return on Assets** (Profitability) around their appointments. The change in the Profitability is defined by the change between pre and post appointment CEO director parent company industry adjusted Profitability calculated as (Net Income / Total Assets). Panel C reports changes in the T**ail Risk** of the CEO director parent company after their appointment. I calculate the variable before the appointment as the average over the years -2 and -3 before the appointment, while I calculate the values after the appointment as the average over the period ranging from t+1 to t+3 in the post-appointment era. All values presented below are the in percentage. A two-sample t-test is used to determine whether the means of different types of CEO directors are significantly different from zero. Where *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

Financial Firm CEO Directors (86) vs. Non-Financial Firm CEO Directors (42)						
	Financial Sector			**Non-Financial Sector**		
	Pre	**Post**	**Change**	**Pre**	**Post**	**Change**
	(1)	**(2)**	**(3) (2) − (1)**	**(4)**	**(5)**	**(6) (5) − (4)**
Panel A: Bank Debt						
Mean Bank Debt	0.472*	0.479*	0.007	0.170 ***	0.364***	0.194***
Median Bank Debt	0.553***	0.646**	0.093***	0.281***	0.454***	0.173**
Panel B: Return on Assets						
Mean Profitability	0.016**	0.018***	0.002***	0.047***	0.051***	0.004***
Median Profitability	0.009***	0.010***	0.001**	0.041***	0.043***	0.002***
Panel C: Tail Risk						
Mean Risk	-0.120	-0.120	0.000	-0.122***	-0.119***	0.003***
Median Risk	-0.115	-0.115	0.000	-0.116**	-0.114***	0.002***

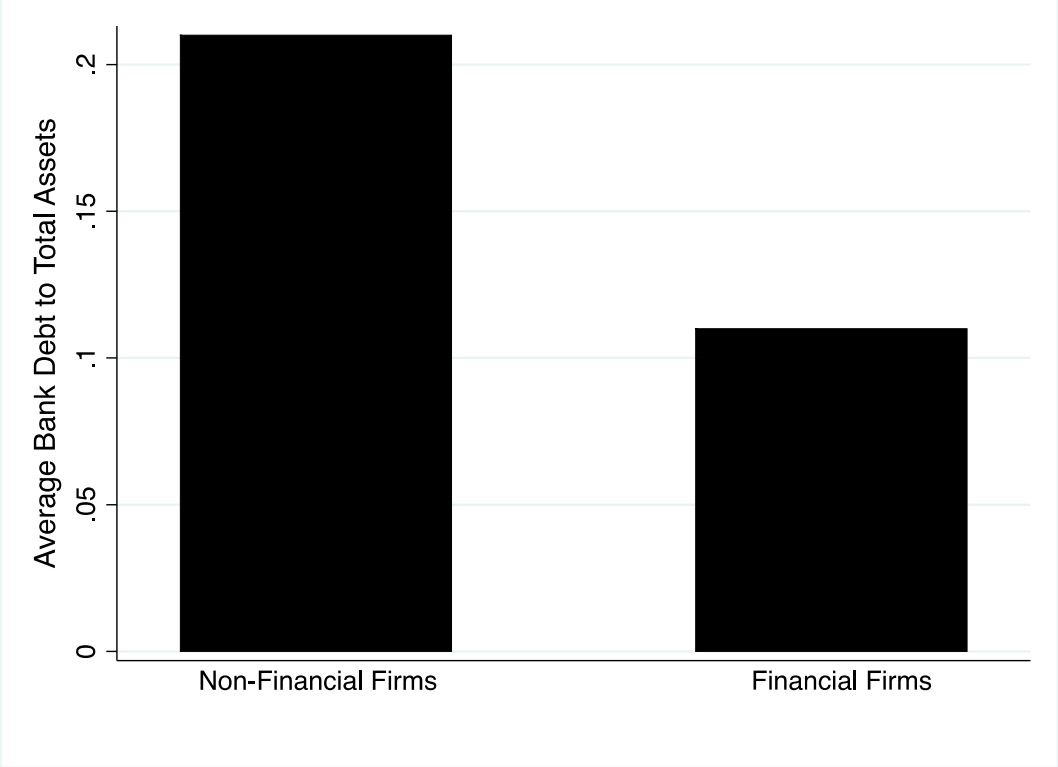

Figure 3-1:

Average total bank debt to total assets of the parent companies of CEOs appointed onto bank boards (Financial vs. Non-Financial firms)

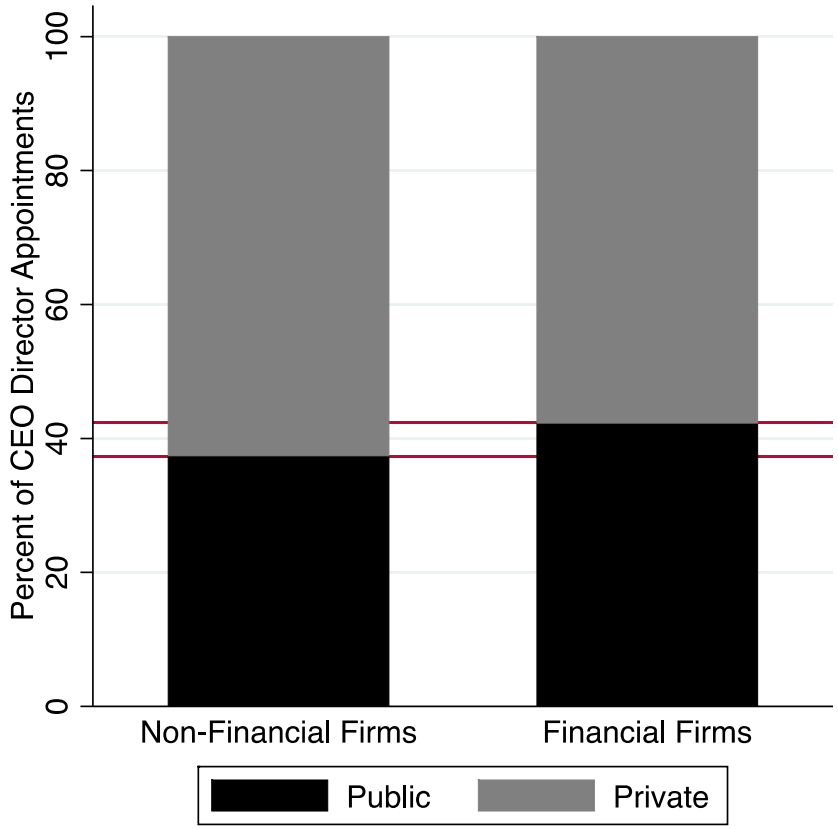

Figure 3-2:

Financial and non-financial firm CEO appointments on bank boards (Private vs public)

Appendix

Outside CEOs as Independent Directors on Bank Boards

This appendix contains the results of additional tests on abnormal returns and the post-appointment effect of CEO directors on bank performance.

Table 3–11: The Impact of Directors' Human and Social Capital

The Table reports the impact of directors' social and human capital on their appointment and abnormal returns. The results for the appointment probability are based on a multinomial logit model as in Table 3. To examine the role of directors' social and human capital on abnormal returns at the time of their appointment, I interacted the appointment dummy with director specific variables that capture aspects of their human and social capital. **Net Loans** is the ratio between net loans to total assets. **Non-Interest Income** is the ratio of non-interest income divided by non-interest income plus net interest income. **Outside Directorships** is the total number of board memberships a director had prior to the appointment on a bank's board, **Directorship Experience** is the total number of years a director has served on the boards of other firms before the appointment, **Financial Qualification** is a dummy variable that takes a value of 1 if the appointed director has a financial qualification as indicated by a degree related to accounting and finance, **Director Network Size** is the number of individuals with whom the director overlaps with while in employment, other activities, or education roles at the same company, organisation, or institution. All regressions include similar control variables as those shown in Tables 3. Robust standard errors (that are also clustered at the bank level in Panel A) are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	Independent CEO Directors		Other Independent Directors		
	Financial Firm	Non-Financial Firm	Financial Firm	Non-Financial	No industry
	(1)	(2)	(3)	(4)	(5)
Net Loans $_{t-1}$	0.207	1.905**	0.445	0.452	2.506*
	(1.068)	(0.949)	(0.658)	(0.560)	(1.380)
Non-Interest Income $_{t-1}$	0.747*	-0.598	-0.175	-0.090	-0.348
	(0.399)	(0.525)	(0.199)	(0.195)	(0.400)
Outside Directorships $_{t-1}$	0.014	0.048***	-0.005	0.016	-0.037
	(0.018)	(0.014)	(0.013)	(0.012)	(0.033)
Directorship Experience $_{t-1}$	-0.003	-0.012	0.018**	-0.008	-0.011
	(0.026)	(0.030)	(0.008)	(0.018)	(0.034)
Financial Qualification $_{t-1}$	-0.298	-0.740	0.625**	0.716***	-0.160
	(0.476)	(0.627)	(0.250)	(0.248)	(0.657)
Director Network Size $_{t-1}$	-0.011	0.023	0.014***	0.013***	0.048***
	(0.014)	(0.020)	(0.005)	(0.003)	(0.011)
Time Fixed Effects	Yes				
Controls	Yes				
Pseudo R^2	0.044				
Observations	2,838				

Table 3–12: Placebo Test for Abnormal Returns

The Table reports regression results on the determinants of abnormal returns for director appointments. The event window is moved to 30 days before the actual event. The base-outcome in all cases is the appointment of an insider director. **CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO onto the board while **Other Independent Director** is a dummy equal to 1 for the appointment of non-CEO independent directors. **Financial Firm CEO** is a dummy equal to 1 for the appointment of an outside CEO from a financial firm, **Non-Financial Firm CEO** is a dummy equal to 1 for the appointment of an outside CEO from a non-financial firm, **Financial Firm Other Independent Director** is a dummy equal to 1 for the appointment of an independent directors working in a financial firms, **Non-Financial Firm Other Independent Director** is a dummy equal to 1 for the appointment of an independent directors working in a non-financial firms. **Board Independence** is the ratio between the total number of independent directors and total board members**. CEO Directors** on the Board is the ratio between the total number of directors who are current CEOs and total board members. **Board Financial Expertise** is the ratio between the number of financial experts and the total number of independent directors on the board. **Board Age** is the log of average age of the board members. **Board Size** is the log transformation of the total number of board members. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board. **CEO Age** is the log age of the bank CEO. **Growth Opportunities** is the log transformation of the market to book ratio. **Profitability** is the ratio between earnings before interest and tax to total assets. **Size** is the log transformation of total assets measured in millions of US dollars. **Tier I Ratio** is the ratio between Tier 1 regulatory capital and Risk Weighted Assets. **Tail Risk** is the average bank daily stock returns in the lowest 5% percentile of the yearly distribution. **TARP Bank** is a dummy variable equal to 1 for the years bank remained in TARP program. **Net Loans** is the ratio between net loans to total assets. **Non-Interest Income** is the ratio of non-interest income divided by non-interest income plus net interest income. **Financial Crisis** is a dummy variable equal to 1 for the period 2007-2009. **Post Dodd-Frank Act** is a dummy variable equal to 1 for the period 2011-2014. Robust Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	CAR (1)	CAR (2)
CEO Directors $_0$	0.050	
	(0.031)	
Other Independent Director $_0$	0.045	
	(0.048)	
Financial Firm CEO $_0$		0.075
		(0.082)
Non-Financial Firm CEO $_0$		0.024
		(0.052)
Financial Firm Other Independent Director $_0$		0.055
		(0.036)
Non-Financial Firm Other Independent Director $_0$		-0.046
		(0.034)
Board Independence $_{t-1}$	0.011	0.015
	(0.009)	(0.011)
CEO Directors on the Board $_{t-1}$	0.005	0.001
	(0.002)	(0.000)
Board Financial Expertise $_{t-1}$	0.004	0.010
	(0.001)	(0.007)
Board Age $_{t-1}$	0.022	0.013
	(0.001)	(0.001)
Board Size $_{t-1}$	0.179***	0.179***
	(0.052)	(0.052)
CEO Duality $_{t-1}$	0.008	0.008
	(0.026)	(0.026)
CEO Age $_{t-1}$	0.017	0.068
	(0.002)	(0.005)
Growth Opportunities $_{t-1}$	-0.078***	-0.078***
	(0.028)	(0.028)
Profitability $_{t-1}$	1.876	1.858
	(1.017)	(1.024)
Size $_{t-1}$	1.963***	1.955***
	(0.508)	(0.507)
Tail Risk $_{t-1}$	-0.013**	-0.013**
	(0.006)	(0.006)
Tier 1 Ratio $_{t-1}$	2.449	2.433
	(0.821)	(0.821)
TARP Bank $_t$	0.001	0.001
	(0.022)	(0.022)
Net Loans $_{t-1}$	0.015	0.007
	(0.009)	(0.000)
Income Mix $_{t-1}$	0.027	0.016
	(0.018)	(0.012)
Financial Crisis $_t$	-0.117**	-0.120**
	(0.055)	(0.055)
Post Dodd-Frank Act $_t$	0.425	0.424
	(0.188)	(0.189)
Observations	1,503	1,503
Adj-R^2	0.055	0.043
Year Fixed Effects	Yes	Yes

Table 3–13: Placebo Test Director Appointments and Effects on Business Models, Performance and Risk (OLS)

The Table reports estimates of the effect of director appointments on business models, performance and risk using an OLS regression in columns (1), (2), (3), and (4). I compare the change in the industry adjusted total loans to total assets **(ΔLoans**) ratio, and non-interest income divided by non-interest income plus net interest income **(Δ Non-Interest Income**), Profitability **(Δ Profitability**) and Tail Risk **(Δ Tail Risk**) before and after the appointment of financial and non-financial firm CEO directors onto bank boards. **Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a financial firm at time *t-3*, **Non-Financial Firm CEO Directors** is a dummy equal to 1 for the appointment of an outside CEO from a non-financial firm at time *t-3*. Following Fahlenbrach et al. (2010), I use the period from t-2 to t-3 to calculate the pre-appointment average value of each variable and the period from t+1 to t+3 to measure the post-appointment average values. All models include control variables. The control variables are measured at time *t-1*. Robust standard errors clustered at the bank level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 represent statistical significance.

	OLS Regression			
	Business Models		Performance	
	ΔLoans	Δ Non-Interest Income	ΔProfitability	ΔTail Risk
	(1)	(2)	(3)	(4)
Financial Firm CEO Directors $_{t}$	-0.019	0.063	-0.032	0.018
	(0.990)	(0.055)	(0.882)	(0.017)
Non-Financial Firm CEO Directors $_{t}$	0.013	-0.085	0.096*	0.052
	(0.678)	(0.080)	(0.030)	(0.040)
Observations	2,103	2,103	2,103	2,103
Year Fixed Effects	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Adj-R^2	0.021	0.151	0.035	0.021

4 A Bank's Capital Management Under Different Board Structures and the Importance of Regulatory Scrutiny

4.1 Introduction

It is widely agreed that a bank's capital strength contributes to financial stability (Berger and Bouwman, 2013; Dinger and Vallascas, 2016). This motivates regulatory attempts to ensure that banks remain adequately capitalized and a growing body of research to investigate what induces banks to hold more capital (Berger et al., 2018; Brewer et al., 2008; Gropp and Heider, 2010; Laeven and Levine, 2009), how they manage their capital position and adjust towards a target ratio (Berger et al., 2008; Memmel and Raupach, 2010).

Nevertheless, there is little evidence on whether, and how, different board structures influence banks in choosing and managing their capital position. Enhancing the understanding on this issue is, however, important to inform the growing debate on how to structure bank boards to maintain stable banks (Adams and Mehran, 2012; Mehran et al., 2011; Vallascas et al., 2017). In this respect, the need to avoid frictions between a bank's internal governance and regulators would require boards that support the key regulatory objective of maintaining adequately capitalized banks, thus limiting costly recapitalizations via taxpayer money when a systemic shock occurs.

In this study, I extend the understanding of which board structures are more supportive of the regulatory objectives in terms of bank capital by investigating how a bank's capital management is influenced by two boards characteristics that have attracted much regulatory and academic attention post the 2007-2009 crisis: i) board independence (Adams, 2012; Anginer et al., 2018; Ellul and Yerramilli, 2013; Erkens et al., 2012; Minton et al.,

2014; Pathan, 2009; Vallascas et al., 2017) and ii) the degree of financial expertise of independent directors (Aebi et al., 2012; Fernandes and Fich, 2012; Minton et al., 2014).

Board independence has been recently linked to the *level* of bank capital ratios via a risk-shifting perspective where the purpose of independent directors is to facilitate shareholders in shifting risk towards the financial safety net (Anginer et al., 2016; 2018). The degree of financial expertise of the independent directors, while it has not yet been directly related to bank capital by the literature, has been linked to bank performance because of its potential influence on directors' understanding of the banking business (Fernandes and Fich, 2012; Minton et al., 2014).

Differently from the extant literature, however, and using a unique sample of 637 U.S. banks selected for the period 2001 – 2014, I relate the two board characteristics mentioned above to three pillars of a bank's capital management: 1) the choice of the target capital ratio; 2) the *Speed of Adjustment* (SOA) towards the target ratio; 3) the financing strategies implemented to move closer to the target. This setting should facilitate the understanding of whether explanations of the influence of boards on bank capital based on risk-shifting are indeed fully plausible.

More specifically, I base my analysis on a dynamic framework as in Berger et al. (2008; 2018) and De Jonghe and Öztekin (2015). In this setting each bank has a target capital ratio and moves towards the target with a speed of adjustment that varies with bank characteristics (including governance) and macroeconomic characteristics. These characteristics also influence the financing choices made to achieve the target. Furthermore, in modeling the adjustment process I crucially distinguish between "undercapitalized" banks (defined as banks below their target ratio) and "overcapitalized" banks (namely, banks above

their target ratio) for two reasons.[21] First, in a dynamic setting, explanations of the nexus between capital and governance based on the potential risk-shifting incentives of bank shareholders, as those in Anginer et al. (2016; 2018) for bank capital ratios, have to account for the degree of capitalization of a bank. In fact, as undercapitalized institutions are more prone to risk-shifting (Hovakimian and Kane, 2000), if present, the incentives to shift risk should especially influence the capital adjustment process of these banks. Second, from a regulatory perspective, it is more important to understand which bank boards avoid and address conditions of undercapitalization, as these are the conditions that damage bank stability and might encourage deleveraging strategies that generate systemic externalities (Anginer et al., 2016).

In a dynamic framework that accounts for the endogeneity of the determinants of bank capital, I initially document that banks with more independent boards, and with more financial experts among their independent directors, privilege significantly lower target capital ratios. Essentially, I find that board structures usually seen as preferable by bank regulators are associated with funding structures less aligned with the regulatory purpose of having adequately capitalized banks. The findings on board independence are consistent with the evidence reported by Anginer et al. (2018) using a static framework on bank capital, while the results on financial expertise support the conclusions in Minton et al. (2014) on the risk and performance effect of financial expertise during the financial crisis, but they go against the evidence in Fernandes and Fich (2012).

[21] It is important to note here that I consider under – and over-capitalised banks from the shareholders perspective and not from the regulatory perspective.

Nevertheless, the choice of the target capital ratio is only one aspect of a bank's capital management that can be influenced by bank boards. Thus, I proceed by investigating the nexus between a bank's board structure and two aspects of the adjustment process towards the target ratio: 1) the speed of adjustment towards this target – namely, how quickly banks move towards their targets; 2) the funding strategies implemented to get closer to the target - that is, whether banks change their capital ratios via an equity channel (equity issuance and changes in the retained earnings) and/or an asset channel (changes in security holding and in the size of the loan portfolio). These channels might lead to different systemic implications from the recapitalization choices of undercapitalized banks. For instance, strategies primarily based on the asset channel might lead to fire-sale effects with potential damages for other banks.

By relying on the estimation of the target capital ratio, as in Berger et al. (2008) and De Jonghe and Öztekin (2015), I derive a reduced form (linear) equation of the speed of adjustment that I estimate separately for undercapitalized and overcapitalized banks. I document that more independent boards maintain more prolonged conditions of undercapitalization, while they accelerate the adjustment process when banks are overcapitalized. However, and more importantly, I find that these results have to be primarily ascribed to independent directors with no financial expertise. I show that an increase in the proportion of financial experts among independent directors of bank boards reduces the time banks remain undercapitalized while it amplifies the period banks remain overcapitalized. In other words, while opting for capital structures with even lower capital ratios as compared to other independent directors, financial expert directors seem to assign significantly more (less) relevance than other directors to the costs that are associated with lengthy conditions of undercapitalization (overcapitalization). the results remain unchanged

when I control for the potential endogeneity of the board variables under a 2SLS setting where the demand and supply theory of independent directors is used to identify appropriate instruments (Knyazeva et al., 2013). In general, I show that the assumption that all independent directors share similar preferences in capital management, as in Anginer et al. (2018), is an over simplification.

I then evaluate whether the observed differences in how the board variables impact on the speed of adjustment reflect differences in the financing policies that banks implement to achieve the target ratio. I find this is the case. Specifically, for undercapitalized banks, I show that independent directors opt primarily for increases in retained earnings and decreases in security holdings to boost their capital ratios; namely, they use less "sophisticated" adjustment strategies. However, financial expert independent directors favour adjustment strategies that contribute to a faster recapitalization via equity issuance. For overcapitalized banks, while independent directors generally implement equity repurchases and decreases in retained earnings jointly with increases in lending activity, adding directors with financial expertise leads to further decrease retained earnings and increase both investments in securities and lending activity.

Ultimately, I do not find that a higher degree of board independence and/or more financial experts on bank boards facilitate regulators in achieving their purpose that banks avoid or promptly correct conditions of undercapitalization. In particular, financial expert directors still favour the choice of a lower target ratio when they sit on bank boards, although they contribute to minimizing the time banks are below the target capital level as compared to other independent directors and privilege a faster recapitalization process via equity issuance. Importantly, in a framework that takes into account all the dimensions of a bank's capital management, and primarily the adjustment process by undercapitalized banks,

the results on financial expert directors are difficult to reconcile with a risk-shifting interpretation of the capital management choices. Instead, they appear to be in line with theory models suggesting that a low equity ratio can be seen as preferable for running a banking business independently of any risk-shifting incentives by bank shareholders (see, for instance, DeAngelo and Stulz, 2015). More generally, only the funding choices of independent directors without financial expertise seem to indicate the intention to shift risk towards other stakeholders and the financial safety net (Erkens et al., 2012; Vallascas et al., 2017), especially when banks are undercapitalized.

To draw a comprehensive picture of the nexus between capital and boards I have, however, to take also into account that banks are also subject to regulatory oversight and this has the potential to influence how the bank internal governance operates. Along these lines the literature shows that independent directors are concerned about their reputation in the labor market (Fahlenbrach et al., 2010; Masulis and Mobbs, 2014) and with regulators when sitting on the boards of regulated firms (Baxter, 2003; Hagendorff et al., 2010; Vallascas et al., 2017). In addition, external regulatory pressure forces regulated firms to enhance the quality of board monitoring (Booth et al., 2002; Hagendorff et al., 2010; Joskow et al., 1993). A key question is, therefore, whether the results vary when independent directors are subject to a growing degree of regulatory scrutiny on their banks and whether there is any difference between financial and non-financial expert directors when they face regulatory scrutiny, possibly due to a different understanding of the implications of this scrutiny.

To explore the influence of regulatory scrutiny on the results, I initially use a difference-in-differences methodology based on the Dodd-Frank Act enacted in July 2010. The Act represents a source of exogenous variation in regulatory scrutiny (see Bindal et al.

(2017) and Bouwman et al. (2018) for a similar argument) for some banks in the sample. The Act introduces a more stringent supervisory regime (including frequent oversight measures and forced routine stress testing by the Federal Reserve Regulations) for banks with at least $10 billion of consolidated assets. Accordingly, from 2011, I should observe an increase in the degree of supervisory oversight on these "treated" banks as compared to other banks.

I show that when banks are subject to a stronger regulatory scrutiny, independent directors increase the target capital ratio and accelerate the adjustment process when banks are undercapitalized. This is especially the case for directors with financial expertise. Furthermore, in the presence of more regulatory scrutiny, more independent boards and a larger proportion of financial expert directors make more likely the use of equity issuance as an adjustment strategy for undercapitalized banks. I achieve similar conclusions when I use the setting proposed by Hirtle et al. (2016) and based on the geographic assignment of BHCs to Federal Reserve districts, to identify exogenous variation in regulatory scrutiny across the sampled banks. In general, the analysis highlights the complementarity between internal governance and regulation by suggesting that only a stronger regulatory oversight induces board structures advocated by regulators and policy makers to opt for a bank capital management more aligned with the regulatory interests, especially when banks are undercapitalized.

This study contributes to two streams of the banking literature. First, this study contributes to the literature on the nexus between bank capital and governance (Anginer et al., 2016; 2018; Lepetit et al., 2015; Molyneux and Chunxia Jiang, 2014). Previous banking studies (Anginer et al., 2016; 2018) have examined the nexus between shareholder friendly governance structures (including board independence) and one aspect of capital

management (the level of bank capital ratios), the relationships between ownership structure, target capital and the speed of adjustment (Molyneux and Chunxia Jiang, 2014), and how shareholder rights influence the adjustment strategies in European banks (Lepetit et al., 2015). The analysis provides novel evidence on the role of boards i) on different aspects of bank capital management, ii) on the importance of director financial expertise and iii) how bank governance influences the choices of undercapitalized and overcapitalized banks.

Second, the study contributes to the literature that examines potential complementarities between a bank's internal governance and regulation. Previous studies have examined these complementarities in the context of the market for corporate control (Hagendorff et al., 2010). Further, there is some evidence on the nexus between director compensation and US banking deregulation (Becher et al., 2005). However, to the best of the knowledge no study has examined these complementarities in the context of a critical aspect of the banking business from a regulatory perspective; namely, the capital structure dynamics of a bank.

The rest of the chapter proceeds as follows. The next section discusses the related literature. Section 4.3 describes the sample, the econometric setting and the variables employed in the analysis. Section 4.4 documents the empirical results on how board structure is related to the target capital ratio, the speed of adjustment and the adjustment strategies. Section 4.5 reports the results when I account for the potential influence of regulatory scrutiny. Section 4.6 concludes.

4.2 Theoretical Background

4.2.1 Board Structure and Bank Capital

The existing banking literature focuses on two main aspects of a bank's capital management: a) what drives the capital ratios, and b) the adjustment process towards the desired ratio. In terms of the first aspect, the literature has identified a wide range of drivers, including profitability and the market-to-book ratio (Gropp and Heider, 2010), risk (De Jonghe and Öztekin, 2015; Jokipii and Milne, 2008; Jokipii and Milne, 2011), market competition (Berger et al., 2018), country factors (Brewer et al., 2008), and macroeconomic conditions (Ayuso et al., 2004; Fonseca and González, 2010). The key conclusion of this literature is that capital requirements are not binding (Berger et al., 2008; Gropp and Heider, 2010).

Significantly less extensive is the evidence on the adjustment process towards a target ratio. Some studies examines the speed of the adjustment process and documents the importance of a stringent regulatory oversight (Berger et al., 2008; De Jonghe and Öztekin, 2015; Memmel and Raupach, 2010), better country governance mechanisms (De Jonghe and Öztekin, 2015) and competition in accelerating the adjustment process towards the target ratio (Berger et al. (2017). Even more limited is the evidence on the strategies that banks implement to modify their capital startucture with the purpose to achieve a target ratio (Berger et al., 2018; De Jonghe and Öztekin, 2015; Lepetit et al., 2015)

Independently of the focus taken, the bank capital literature gives little attention to the role of bank boards in bank capital management. A few execptions are in Anginer et al. (2016) and Anginer et al. (2018). In these studies, the governance structure of a bank affects the shareholder influence on managers and the related risk-shifting incentives that drive

bank choices. Accordingly, in line with studies on non-financial firms (Berger et al., 1997; Friend and Lang, 1988), Anginer et al. (2016) show that banks with more shraeholder friendly boards (that is board of intermediate size or characterized by the separation between CEO and the board Chairman) prefer low capital levels, thus providing evidence that shareholders aim to transfer risk onto financial safety nets. The argument of the risk-shifting strategies associated with shareholder friendly governance, including higher board independence, is further reiterated by Anginer et al. (2018) by showing a more risk-taking attittude, that results also in higher leverage, in banks than in non-financial firms.

The above studies emphasizes only one aspect of a bank's capital management (the capital level) and do not account for the adjustment process and for potential differences in this process among undercapitalized and overcapitalized banks.[22] This adjustment process, however, is equally relevant for financial stability as it might contribute to avoiding prolonged conditions of undercapitalization at the bank level and to the adoption of recapitalization choices that can boost bank and systemic stability. Further, there are several arguments that motivate an influence of governance on the adjsutment process due to shareholders favoring retaining less capital and prefering to avoid dilution of a firm ownership (La Porta et al., 2002; Lepetit et al., 2015). Moreover capital management posits

[22] Other studies relate the dynamics of bank capital to the ownership structure. Molyneux and Chunxia Jiang (2014) show that private Chinese banks hold more capital and are more likely to make quick adjustment towards target capital levels as compared to public Chinese banks. Lepetit et al. (2015) show that when control and cash-flow rights are identical, to boost capital ratios European banks issue equity without lowering lending. In contrast when control rights are larger than cash-flow rights European banks prefer to reduce lending rather than issuing equity.

different costs and choices for undercapitalized and overcapitalized banks. Conditions of undercapitalization are a major concern for creditors and regulators but not necessarily for shareholders. These conditions might then require equity issuance with effects on a bank's ownership structure. In contrast, being overcapitalized may be a concern for shareholders and does not require adjustments in the ownership structure.

It follows that more shareholder friendly boards (highly independent boards) may influence how a bank adjusts the capital structure in different directions for undercapitalized and overcapitalized banks. Specifcially, in the presence of more independent directrors, the adjustment process towards a chosen target ratio might become slower (quicker) when a bank is a characterized by a condition of undercapitalization (overcapitalization) and might be implemented via adjustment strategies that limit the funding contribution (maximize the payout for) of the shareholders. Along these lines, Morellec et al. (2012), although not primarily for banks, establish both theoratically and empirically that manager-shareholder conflicts are the first order determinants not only for the leverage choice of a firm but also for the capital adjustment process. Furthermore, in a sample of non-financial firms, Liao et al. (2015) document that firms with greater percentage of independent directors on board adjust to shareholders' desired capital ratio quickly.

A further simplification contained in the studies on bank capital ratios and governance is the assumption that all independent directors have similar preferences in terms of capital management. However, not all independent directors have the skills to fully understand the exploitation opportunities of the financial safety net, on the one hand, and the overall costs and benefits that characterize a certain strategy in terms of capital management, on the other hand (see Minton et al. (2014) for a related point). In this respect, their degree of financial expertise appears to be critical (Hau and Thum, 2009; Minton et al., 2014).

It is often suggested that, as compared to other independent directors, financial experts possess lower costs in acquiring information concerning financial transactions and the associated risks. This should result in a more efficient board advising (Harris and Raviv, 2008). Consequently, boards with more financial experts can promptly recognize threats to bank stability and could potentially advise the management on funding choices that might secure this stability. While the former argument is in line with the regulatory perspective on financial expertise (BIS, 2015), an alternative view postulates that financial experts possess the skills to identify risks that are primarily beneficial to shareholders and to understand the advantages of exploiting the explicit and implicit government guarantees given to banks via an increase in the residual claims of the bank's shareholders (Acharya et al., 2012; Keeley, 1990). This might consequently lead to capital management choices being mainly inspired by risk-shifting strategies and thus against the regulatory purpose of ensuring bank stability.

To date there is, however, no evidence on how financial expert directors impact on bank capital, whereas there are mixed findings on their influence on bank performance and risk. In line with the former (regulatory) interpretation, in Fernandes and Fich (2012) banks with greater financial expert directors have lower risk before the global financial crisis, better performance during the crisis, and were less likely to receive TARP funding. In contrast, in Minton et al. (2014) US bank with more financial expert independent directors show worse performance during the crisis, thus supporting instead the latter interpretation.

In general, analyzing how board structures influence a bank's capital management appears particularly important in a regulatory setting that, while stressing the need of banks being adequately capitalized, is increasingly emphasizing the role of bank boards for financial stability (BIS, 2015; Kirkpatrick, 2009).

4.2.2 Board Structure, Bank Capital, and Regulatory Scrutiny

The conventional theory setting employed in previous studies on bank capital and governance (Anginer et al., 2016; 2018) motivates the influence of independent directors with the purpose of these directors safeguarding shareholder interests.

However, banks and their directors are also subject to regulatory scrutiny and this scrutiny can significantly influence how board structure relates to capital management. In particular, a number of studies highlight that independent directors are concerned about their reputation in the labor market (Fahlenbrach et al., 2010; Masulis and Mobbs, 2014). Along these lines, when appointed to the board of regulated firms, directors wish to be perceived by regulators as effective monitors of their firm and understand the negative consequences for their current and future appointments when regulators lose trust in them (Baxter, 2003; Hagendorff et al., 2010). In a similar vein, Joskow et al. (1993) and Booth et al. (2002) claim that regulatory pressure forces regulated firms to enhance the quality of board monitoring. A similar conclusion is achieved in banking studies (see, for instance, Hagendorff et al., 2010).

A stricter regulatory scrutiny might, therefore, provide incentives to independent directors to promote capital management choices more aligned to the regulatory purpose of safeguarding the safety and soundness of banks. Consequently, independent directors might opt for larger target capital ratios and take quicker corrective actions to rebalance their capital structure, especially when a bank is undercapitalized, in response to additional regulatory scrutiny. In essence, in the attempt to avoid damage to their reputation and paying hefty penalities to regulators (American Banker's Association, 2006; Adams and Ferreira, 2012), independent directors could manage bank capital more in line with the regulatory objectives.

Further, financial expert directors' better understanding of bank management, and its financial safety net implicatiions, might also have an impact on how they react to an increase in regulatory scrutiny as compared to other independent directors. In other words, financial expert directors might be more aware of the importance of maintaining their reputation with regulators, thus being more sensitive in their capital management to a growing regulatory scrutiny.

Notably, the importance of regulatory scrutiny in shaping more conservative bank policies and risk-taking has been highlighted by several studies (Bassett et al., 2015; Hirtle et al. 2016; Krainer et al., 2009; Peek and Rosengren, 1995). A critical difference of the analysis, however, is the focus on how regulatory scrutiny interacts with internal governance in influencing a bank's capital management.

4.3 Sample, Model and Variables

4.3.1 Sample and Data Sources

The sample consists of 637 US banks selected for the period 2001 – 2014. The sample is obtained by matching the population of listed US banks in BoardEx, from where I extract governance data, with COMPUSTAT BANKS that provides accounting data. [23] Macroeconomic data are from DATASTREAM. I eliminate potential survivorship bias by

[23] BoardEx includes data on board structure and director level employment for public and private firms. Several recent corporate governance studies have used BoardEx (see Minton et al., 2014).

keeping banks that become inactive/delisted or are acquired/merged during the sample period.[24]

Insert Table 4-1 Here

BoardEx holds data on a limited number of banks pre-2004 and the sample size increases after 2004. Therefore, to reduce the impact of missing data on the analysis I hand-collected governance data from DEF-14A reports for all banks that exist in BoardEx from 2004 but missing in the initial part of the sample period. This exercise makes the dataset unique and extensive, both in regard to the number of banks and the length of the sample period. Table 4-1 shows that the yearly number of the sampled banks ranges from a minimum of 242 (in 2001) to a maximum of 412 (in 2008) with an average of 352 banks per year. The total number of observations I employ in the analysis is equal to 4,929 over a 14-year period.

4.3.2 Target Capital Ratio, Variable Speed of Adjustment and Sources of Adjustments

As in Berger et al. (2008; 2017) and De Jonghe and Öztekin (2015), in the empirical setting banks have a target capital ratio and they move towards this target with a speed of adjustment that varies with their characteristics. Therefore, the setting accounts for the

[24] Survivorship bias occurs when only survived banks are kept in the data for analysis. However, in banking sector survivorship bias may not be serious problem as FDIC do not allow large banks to fail (Adams and Mehran, 2012; Boyd et al., 1993). To examine whether survivorship bias is a concern in my sample I quantify the magnitude of the survivorship bias; I find that 8% of the banks in my sample default or merged during 2001 – 2014.

presence of sources of heterogeneity across banks in terms of how they define their target capital ratio and, more importantly, how quickly they adjust to the target. In the analysis one of the key sources of heterogeneity is governance.

The setting is motivated by bank capital adjustment decisions being the result of the trade-off between the cost of adjustment towards the target and the cost of deviation from the target capital. This trade-off implies that banks do not achieve immediately the target ratio (Flannery and Rangan, 2006). Furthermore, the differences highlighted in section 4.2 motivate the choice to model the adjustment process separately for undercapitalized and overcapitalized banks.

4.3.2.1 Estimating the target capital

Following Berger et al. (2008; 2018) and Lepetit et al. (2015) I estimate the target ratio in terms of equity capital divided by total assets (**CR**). Panel A of Table 4-2 reports summary statistics for this variable that has a sample mean (median) of 9.8% (9.4%) similarly to what is reported by previous studies (see, for instance, Acharya et al., 2015; Anginer et al., 2018; Berger et al., 2008; 2017; Flannery and Rangan, 2008).

Insert Table 4-2 Here

To estimate the target capital ratio, I adopt a partial adjustment model (Berger et al., 2008; De Jonghe and Öztekin, 2015; Lepetit et al., 2015; Memmel and Raupach, 2010). The starting point is the relationship reported below:

$$CR_{i,t} - CR_{i,t-1} = \lambda(CR^{*}_{i,t} - CR_{i,t-1}) \quad (1)$$

$CR_{i,t}$ is the observed capital ratio at time *t*, $CR_{i,t-1}$ is the bank capital ratio of the previous year and λ is an adjustment speed coefficient ranging from 0 and 1. The closer λ

is to 0, the slower the bank capital adjustment process and the longer the time a bank takes to achieve its target capital ratio. $CR^{*}_{i,t}$ is the (unobserved) target capital ratio that is a function of lagged bank governance characteristics (*BG*), other lagged bank characteristics (*X*), macroeconomic specific controls (*MEco*), time fixed effects (Year) and a bank specific effect (η_i) as follows:

$$CR^{*}_{i,t} = \vartheta BG_{i,t-1} + \delta X_{i,t-1} + \theta MEco_{t-1} + \rho Year_t + \eta_i \quad (2)$$

Substituting equation (2) into equation (1) yields the following standard partial adjustment model:

$$CR_{i,t} = \left(\vartheta BG_{i,t-1} + \delta X_{i,t-1} + \theta MEco_{t-1} + \rho Year_t + \eta_i\right) + (1-\lambda) CR_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

I estimate equation (3) using the System GMM estimator (Blundell and Bond, 1998). The System GMM estimator addresses endogeneity concerns by combining the moment conditions from the first-difference and the level equations. Bank-specific variables are endogenous covariates and I choose a set of instruments that fulfill two conditions (Wintoki et al., 2012): i) exogeneity and ii) explanatory power. Accordingly, I employ the first lag of the endogenous variables as instruments in the level equation and lag values from *t – 1* to *t – 5* of the same variables in the difference equation.

I verify that the instruments are valid using a Hansen J test of over-identifying restrictions and select the optimal lag structure of each instrumental variable using the difference in Hansen test statistics. I choose lag values for each instrument for the equations in level and difference that allow us not to reject the difference in Hansen test of exogeneity of instruments based on a chi-square statistic. Further, following Arellano and Bond (1991), I verify the absence of second order serial correlation in the first difference residual using

the m2 statistic. Finally, I use the option "collapse" in STATA to avoid the bias that arises when the number of instruments approaches the number of observations.[25]

4.3.2.2 Estimating the speed of adjustment

From equation (3) I obtain the initial estimates of the coefficients needed to calculate the target capital ratio at time *t* ($CR^*_{i,t}$). I next compute the difference between the estimated target capital ratio and the actual capital ratio in year *t-1* ($\widehat{DIFF}_{i,t-1} = CR^*_{i,t} - CR_{i,t-1}$). This allows us to identify banks that are above the target capital ratio($\widehat{DIFF}_{i,t-1} < 0$) and those that are below the target ($\widehat{DIFF}_{i,t-1} > 0$). I finally allow the speed of adjustment to vary with bank governance, bank fundamentals and macroeconomic characteristics. As a result, I define the speed of adjustment λ as a function of the set of explanatory variables employed in equation (3). The speed of adjustment equation can then be formalized as follows:

$$\lambda_{i,t} = \boldsymbol{\xi}\mathbf{Z}_{i,} \tag{4}$$

[25] As compared to the alternative difference-in-difference estimator proposed by Arellano and Bond (1991), given the instruments are valid, the System GMM estimator yields higher levels of both consistency and efficiency. Furthermore, it allows us to incorporate time persistent variables in the model. This is important for the study as most of the corporate governance variables vary only slightly over time. I estimate the System GMM specification via a two-step approach that is asymptotically efficient in the estimation of the coefficients but causes a downward bias in the standard errors. I correct this by using the Windmeijer (2005) correction process.

Where $\boldsymbol{\xi}$ is a vector of coefficients and $\mathbf{Z}_i$ is a set of explanatory variables. Substituting equation (4) into equation (3), I obtain the Variable Speed of Adjustment (VSOA) model.

$$CR_{i,t} - CR_{i,t-1} = \xi Z_{i,t-1}(CR^*_{i,t} - CR_{i,t-1}) + \psi Year_t + \varepsilon_{i,t} \quad (5)$$

This model can be rewritten as:

$$\Delta CR_{i,t} = \chi[(\xi Z_{i,t-1})\widehat{DIFF}_{i,t-1}] + \psi Year_t + \varepsilon_{i,t} \quad (6)$$

I estimate equation (6) separately for banks above and below their target capital ratio via pooled OLS regressions (Berger et al., 2008; De Jonghe and Öztekin, 2015). Essentially, I regress the yearly change in the capital ratio against the product between $\widehat{DIFF}_{i,t-1}$ and the determinants of the variable speed of adjustment in equation (5). Estimation of equation (6) produces estimates of $\hat{\chi}$ (a speed of adjustment that varies across banks and over time).

4.3.2.3 Modeling the sources of adjustment

A second aspect of the adjustment process is the choice of the funding strategies that banks employ to approach the target ratio. For instance, an undercapitalized bank has to implement an upward adjustment to the capital ratio and this can be done by means of an increase in the numerator of the capital ratio (equity issuance and/or an increase in earning retention) and/or a decrease in the denominator (asset contraction, including loan contraction). While the final outcome of the two adjustment strategies might be the same, a contraction of bank assets, differently from an increase in equity, might lead to an asset fire-sale (thus affecting also the value of the assets of other banks) and/or a decline in the supply of credit. Similarly, a bank that is above its target capital ratio has to adjust downward

its observed capital ratio via a decrease in equity and/or an increase in assets, (such as an expansion to the credit supply).

To assess how bank board structures are associated with the adjustment mechanisms of the capital ratio, I distinguish the adjustments implemented via equity from asset adjustments. The *Capital Adjustment* channel includes the change in equity capital *(⊿ Equity)*, calculated as the annual change in the ratio between equity (minus net income, retained earnings and accumulated earnings), and the annual change in retained earnings scaled by average assets (*⊿ Retained Earnings*). The *Asset Adjustment* channel consists of the annual change in the other earning assets (*⊿ Securities*) and the annual change in the net loans (*⊿ Loans*). I scale all changes by average bank assets (from time *t* to time *t-1*).

Similarly to Lepetit et al., (2015), I model the adjustment process as follows:

$$\Delta C_{i,t} = \chi C_{i,t-1} + \left[\alpha_1 + \beta_1 BG_{i,t-1} \right] \times Surplus_{i,t-1} + \left[\alpha'_1 + \beta'_1 BG_{i,t-1} \right] \times Deficit_{i,t-1} + \delta X_{i,t-1} + \theta MEco_{t-1} + \sigma Year + \varepsilon_{i,t} \quad (7)$$

Where $\Delta C_{i,t}$ is one of variables described earlier, $BG_{i,t-1}$ is a set of governance variables, *Surplus* and *Deficit* are the absolute value of the difference between the estimated target and the actual capital ratios when the bank is above or below the target level respectively, $X_{i,t-1}$ is a set of bank specific controls employed in the initial tests, *MEco* is a set of macroeconomic controls, Year is time dummies and finally $\varepsilon_{i,t}$ is a random error term. To avoid the potential biases arising from endogeneity, all independent variables enter the model with a one-year lag. As in Lepetit et al. (2015) I estimate the model using the two-step system GMM.

4.3.3 Governance Variables and Other Controls

Panel B of Table 4-2 reports the description and summary statistics of the governance variables I employ. The key governance variables are the number of independent directors divided by board size (**Board Independence**) and the ratio between the number of financial expert independent directors and the number of independent directors (**Financial Expertise)**. The definition of financial expertise follows the SEC.[26] As Minton et al. (2014), I include simultaneously the two variables in the models. The coefficient of **Board Independence** indicates, therefore, the impact on capital management while maintaining constant the degree of expertise in the board. The coefficient of **Financial Expertise** indicates the impact due to adding a director with financial expertise in lieu of a director without financial expertise**.**

The analysis also accounts for other board characteristics: a dummy equal to one if the CEO is the chairman of the board (**CEO Duality**), the average age of board members (**Board Age**) and the log of the total board members (**Board Size**). CEO Duality should indicate less shareholder oriented boards (Berger et al., 1997; Pathan and Skully, 2010) that should opt for capital management choices less aligned with shareholder interests. Older directors are often seen as having a risk averse attitude and this might increase the target ratio and the speed of adjustment, especially when banks are below the target capital

[26] The SEC definition identifies financial experts based on their current and past working experience and education. https://www.sec.gov/news/press/z2003-6.htm. Financial working experience is when directors currently hold or held a position in a bank/financial organisation. Have experience working as a CFO, accountant at a non-financial firm. Financial education includes if a director has a MBA, CFA, CPA, or a Finance related degree.

(Gervais and Odean, 2001). Moreover, older directors may have more reputational concerns, and this may lead to a higher target and a faster adjustment process (Graham, 1999). Larger boards are potentially more efficient monitors and advisors of managers in complex organisations because of a greater variety of expertise (Adams and Mehran, 2012; Aebi et al., 2012; Pathan and Faff, 2013), but they might also have larger coordination problems among directors, thus leading to the poor monitoring of managers (Hermalin and Weisbach, 2001; Pathan, 2009).

Panel C reports bank controls taken from the capital structure literature (Berger et al., 2008; Flannery and Rangan, 2006; Gropp and Heider, 2010). Higher values of the ratio between fixed to total assets **(Tangibility)** signal lower asset substitution problems and agency cost of debts. Further, the ratio between non-performing loans to net loans (**Non-Performing Loans**) accounts for bank risk as there is evidence of a positive correlation between bank capital and bank risk (De Jonghe and Öztekin, 2015; Jokipii and Milne, 2008). The ratio between non-interest income and total operating income (**Non-Interest Income**) captures the importance of business lines that absorb less capital than loans and lead to a lower probability that a bank experiences a large (deficit) deviation from the target ratio (Jokipii and Milne, 2008).

I control for profitability using the ratio between net income and total assets (**ROA**). More profitable banks may opt for lower target ratios as they have easier access to the debt market. Further, when below (above) target capital they may choose to adjust slowly (quickly) to the higher (lower) target capital ratio because higher profitability reduces the cost of bankruptcy and financial distress (Berger et al., 2018). The dividend pay-out to total assets ratio (**Dividends to Assets**) and the market to book ratio (**Growth Opportunities**) account for the agency costs arising from the availability of free cash flow. Larger dividend

payments (growth opportunities) reduce free cash flow, thus leading to a higher target capital ratio and a faster (slower) speed of adjustment in banks below (above) the target (Gropp and Heider, 2010; Jensen, 1986).

The ratio between income tax paid and income before tax (**Effective Tax Rate**) controls for the tax benefits from using debt that favour leverage (see Byoun, 2008; DeAngelo and Masulis, 1980). Two additional controls are the log of bank total assets (**Size**) and the S&P credit rating **(Ratings)** converted to a number ranging from 1 to 9.[27] Larger banks and banks with better credit quality have easier access to the debt markets and this might lead to a lower target ratio (Berger et al., 2008; Brewer et al., 2008; Cook and Tang, 2010; Gropp and Heider, 2010). Further, the presence of implicit and explicit too-big-to-fail guarantees might reduce the incentives to proceed with a quick adjustment when a large bank is undercapitalized.

The log transformation of the number of analysts (**Analysts**) and the ratio between total institutional ownership and shares outstanding (**Institutional Ownership**) control for the influence of information asymmetry and ownership structure on a bank's capital management (Barry et al., 2011; Flannery, 1998; Healy and Palepu, 2001). Analysts should improve bank transparency (Irvine, 2003; Lee and So, 2017; Moyer et al., 1989), thus leading to a higher target capital and a quicker adjustment towards the target capital. Powerful institutional investors have a tendency to exacerbate the conflict between dispersed creditors and shareholders which results in moral hazard problems that lower the target

[27] I define credit rating as a categorical variable that takes values from 1 to 9. Where 1 = No ratings, and 9 = A+.

capital ratio and the speed of adjustment when banks are below the target ratio (Barry et al., 2011; Becht et al., 2012). The final bank control I include is a dummy equal to one for the period a bank was in the TARP program (**TARP Bank**), as this could influence its capital management.

Finally, Panel D shows macroeconomic and crisis controls, such as the change in real GDP (**GDP Growth**) to capture pro-cyclical effects of capital management (Ayuso et al., 2004), the change in the consumer price index (**Inflation)** and a dummy equal to one from 2007 to 2009 (**Crisis**). Undercapitalized banks may find it easier to increase equity during booming conditions, but they may also judge being below target as being less problematic. Similarly, crisis periods could lower the speed of adjustment towards the target capital ratio due to the excessive cost of equity capital (Acharya et al., 2015).

4.4 Board Independence, Financial Expertise and Capital Management

4.4.1 Target Capital Ratio and Deviations from the Target

Panel A of Table 4-3 shows the regression results for the estimation of the target capital equation via GMM. Column (1) reports the results from equation (3) while column (2) shows the coefficients for the target equation that I have obtained by dividing the coefficients in column (1) by the speed of adjustment (equal to 1 minus the estimated coefficient of $CR_{i,t-1}$).

Insert Table 4-3 Here

I find that banks adjust their capital ratio at an approximately 19% rate, implying that banks take on average more than 4 years to close the gap between the target and the actual

capital ratio.[28] This finding is similar to those reported by other studies (Berger et al., 2008; De Jonghe and Öztekin, 2015; Memmel and Raupach, 2010). In terms of the key explanatory variables, board independence has a negative and significant impact on the target capital ratio; namely, more independent boards prefer higher leverage and this might favour risk shifting onto government safety nets and taxpayers (Acharya et al., 2015; Anginer et al., 2016; Erkens et al., 2012; Jensen, 1986; Pathan, 2009). In addition, the financial expertise variable has a negative and significant impact on the target capital ratio; namely, replacing independent directors without financial expertise with directors with financial expertise further lowers the target capital ratio.

Board independence and financial expertise, however, are not the only governance variables significantly related to the choice of the target capital ratio by a bank. I also find that CEO duality, signaling less shareholder influence on bank boards, has a positive impact on bank target capital. Furthermore, Board Size and Board Age also have a positive influence on the target ratio, showing that larger and older boards favour equity over debt.

In terms of bank-specific controls, the results are generally consistent with the existing literature (Anginer et al., 2016; Benston et al., 2003; Diamond and Rajan, 2000; Gropp and Heider, 2010; Flannery and Rangan, 2008). The bank target capital increases with bank risk (De Jonghe and Öztekin, 2015; Jokipii and Milne, 2008), the non-interest-income share and growth opportunities (Frank and Goyal, 2009; Harris and Raviv, 2008), whereas it decreases with the degree of institutional ownership (Barry et al., 2011; Flannery,

[28] The adjustment made by banks in the 4 year time period is calculated as $(1-(1-0.812)^4) = 99\%$

1998), size, and the consequent too-big-to fail benefits (Berger et al., 2008; Brewer et al., 2008), ROA (Berger et al., 2018) and credit rating (Berger et al., 2008; Kisgen, 2006). Furthermore, banks show larger target capital ratios during the period they were subject to the TARP program. .

As far as macroeconomic controls are concerned, inflation has a positive and significant coefficient, consistent with banks increasing target capital ratios in macroeconomic states that boost profitability (De Jonghe and Öztekin, 2015). The real GDP growth and the crisis dummy show significant and negative coefficients in column (2), but no significant effects in column (1).

I next report in Panel B of Table 4-3 summary statistics for the estimated target capital ratio and the related deviation from the target that I derive from the estimates (namely, the difference between the target capital ratio and the actual capital ratio (DIFF)). The average (median) bank target capital ratio is equal to 10% (9.9%), while the average (median) deviation is equal to 0.2 percentage points (0.4 percentage points). More importantly, I find that most of the observations in the sample (2,736 out of 4,929) belong to banks that are below the target capital ratio with an average (median) deviation of 2.2 (1.8) p.p.

Figure 1 gives a more comprehensive picture of the sample distribution of DIFF. While the sample distribution of DIFF is similar to a normal distribution, there are more extreme positive than negative values. This confirms that the sampled banks are more likely to hold capital below their target capital levels as indicated in Panel B.

Insert Figure 1 Here

Overall, the analysis shows that the board structure matters for a bank's choice of the target ratio, with lower targets being privileged by boards that are more independent and with more financial experts among the independent directors.

4.4.2 The Influence of Board Independence and Financial Expertise on the Speed of Adjustment

I next examine the relationship between board independence (financial expertise) and the speed of adjustment towards the target capital ratio separately for banks operating below and above the target. I report the results from equation (6) in Table 4-4 where the first two columns refer to banks below and above the target, respectively. The last column of the table shows the z-test of equality between the coefficients of the two regressions.

I find that more independent boards opt for a slower (quicker) adjustment process when banks are undercapitalized (overcapitalized). These findings are in line with the perspective that an increase in board independence is accompanied by capital management choices that tend to minimize the funding contribution of shareholders (Anginer et al., 2016).

However, the financial expertise of independent directors also matters for the capital structure dynamics and its effect on the speed of adjustment differs from what I observe in terms of board independence. More precisely, when banks are below the target, an increase in the proportion of financial expert directors, increases the speed of adjustment toward the target ratio. In other words, an increase of financial expertise among independent directors reduces the length of time of undercapitalization that is typically observed in banks with more independent boards. In contrast, when banks are above the target ratio, an increase in the proportion of financial experts among independent directors reduces the speed of

adjustment. This result indicates that financial expert directors are aware of the risks from extreme conditions of undercapitalization and their funding choices are not necessarily motivated by risk-shifting arguments.

Insert Table 4-4 Here

Notably, other governance variables also have different effects on the speed of adjustment when banks are below or above the target capital ratio. Specifically, CEO duality, signaling more manager-oriented boards, does not affect the speed of adjustment when banks are below the target but allows banks to deviate for longer from the target when they hold excess equity. Further, column (2) shows that banks above the target capital ratio have a slower adjustment process (that does not favour shareholders) in the presence of larger boards.[29]

[29] In terms of bank controls, I find that a better credit rating accelerates the adjustment process when banks are above the target (and need more debt). Furthermore, below (above) target capital banks with higher non-performing loans and non-interest income, and TARP banks make quicker (slower) upward (downward) adjustments. Larger and more profitable banks show a slower (quicker) adjustment process when they are below (above) the target ratio. The size result shows that too-big-to-fail opportunities reduce the incentives of banks to quickly recapitalize. Further, during the 2007-2009 crisis, banks below (above) the target, show a slower (quicker) speed of adjustment. This is consistent with the presence of additional costs for shareholders to hold equity in the banks and with risk-shifting incentives during periods of systemic distress (Anginer et al., 2016). In contrast, better macroeconomic conditions (namely, a larger real GDP growth rate) accelerate the speed of adjustment of both groups of banks.

One possible concern with the results from equation (6) is endogeneity. For instance, more independent boards might be preferred by banks that opt for a capital dynamic that is more aligned with the interests of shareholders. Similarly, financial experts might prefer to join banks that follow capital adjustments that lower potential reputational damage (Masulis and Mobbs, 2014).

To account for endogeneity, I repeat the analysis under an instrumental variable setting. The instruments for board independence and the financial expertise of independent directors are motivated by studies highlighting the local nature of the market for independent directors (Knyazeva et al., 2013; Wang et al., 2013). Accordingly, I employ the average value of board independence *in non-financial firms* computed at the state level as an instrument for bank board independence and use the average value of financial independent directors in non-financial firms at the state level as an instrument for financial independent directors.

I report the results of the additional tests based on the IV setting in the appendix. The first stage regressions for banks below and above the target capital show that the instruments enter the model with a positive and highly significant coefficient (and the significance of the Cragg-Donald Wald F test for weak instruments confirms the validity of the instruments).[30] More importantly, the second stage regression shows that the results remain qualitatively the same.

[30] Additionally, the Kleibergen Paap Wald F-test for weak identification also suggests that the setting does not suffer from weak instruments.

Overall, the analysis supports the theory of asymmetric adjustment in terms of the speed of adjustment proposed in recent studies (Antoniou et al., 2008; Ball et al., 2000; Byoun, 2008; Berger et al., 2018) and identifies several variables that influence this asymmetry. In particular, the same as other independent directors, financial expert directors minimize the capital level contributed by shareholders but, differently from independent directors without expertise, they also adjust more quickly when a bank is undercapitalized. In short, they contribute to reducing lengthy undercapitalized conditions at the bank level as compared to other independent directors and this goes against a risk-shifting interpretation of their behavior.

4.4.3 How Does Board Structure Influence the Adjustment Process?

Table 4-5 reports the results of the source of adjustment equations. The first two columns refer to capital adjustments and the last two columns to asset adjustments. More precisely, in columns (1) and (2) I interact board independence and the financial expert measure with *Surplus* and *Deficit* using $\triangle$ *Equity* and $\triangle$ *Retained Earnings* as dependent variables, respectively. In columns (3) and (4) I repeat a similar analysis focusing on $\triangle$ *Securities* and $\triangle$ *Loans* as the dependent variables.

Insert Table 4-5 Here

I find that, when banks are above the target, an increase in board independence favours capital adjustments via the equity channel (equity repurchases and decreases in retained earnings). Both these adjustments favour shareholders. In the presence of a capital deficit, an increase in board independence is accompanied by increases in retained earnings (but not by equity issuance) and a decrease in securities. In the case of loans, however, I find that more independent boards mitigate the lending contraction in undercapitalized

banks. Overall, independent boards seem to favour capital management choices in line with shareholder interests.

A different picture of the adjustment strategies of banks is offered by the financial expertise variable. In the case of overcapitalized banks, the adjustment strategies rely on a decrease in retained earnings and an asset expansion both in terms of securities and loans. In response to a capital deficit, financial expert directors favour the implementation of adjustments via equity issuance, but they also facilitate decreases in securities. The key difference, as compared to other directors is, therefore, their reliance on the equity market to boost the capital ratio. This contributes to explaining why these directors help to enable a quicker adjustment process when banks are undercapitalized.

All in all, financial expert directors appear less concerned than other independent directors with ownership dilution due to the adjustments and are more concerned with the effectiveness (speed) of the adjustment strategies. Again, this finding is not fully supportive of a risk-shifting story.

4.5 Boards Structures, Regulatory Scrutiny and Bank Capital Management

Banks are subject to a stringent regulatory oversight and this oversight has the potential to influence the choices of independent directors in banks. In this section I document the interplay between governance and regulation by examining how the degree of regulatory scrutiny on a bank moderates the influence of board structures on capital management. To conduct the analysis, and assign a causal role to regulatory scrutiny, I need to identify possible sources of exogenous variation in regulatory scrutiny across banks. To this end, I employ two settings.

In the first I focus on an exogenous shock, following the adoption of the Dodd-Frank Act in July 2010, in the degree of regulatory scrutiny for banks with total assets above $10 billion. The adoption of the Dodd-Frank Act in July 2010 offers an adequate setting as one of the key changes of the act is the modification of the supervisory regime for banks that are above $10 billion in terms of total consolidated assets.

The new regime requires, for instance, more frequent regulatory inspections and the need for these banks to be periodically subject to stress tests. I employ this exogenous shock in the regulatory scrutiny of banks above the size threshold to implement a difference-in-differences setting on how regulatory scrutiny affects the results.

A critical step to implementing the analysis is the choice of the "treated" and control groups of banks that I have to compare. I identify these groups by following a similar approach as in Bindal et al. (2017) and Bouwman et al. (2018). Accordingly, I define the treated group as banks with total assets in the range between $10 billion and $20 billion and the control group as the banks with assets between $1 billion and $7 billion.[31] Bouwman et al. (2018) suggest that non-treated banks should be reasonably far away from the $10 billion threshold. This is because banks close to $10 billion might experience an indirect effect of

[31] For robustness I also estimate a model with a narrower asset range for treated and a wider asset range for untreated banks. Results are reported in Appendix, Table 4-11. Specifically, I define treated banks between the asset range of $10 billion and $13 billion, and untreated banks between the $5 million and $7 billion range.

regulatory change by taking corrective actions with the intention of expanding their size in the near future.

In the second setting, I employ a plausibly exogenous variation in regulatory scrutiny (as compared to bank characteristics) based on a bank-level variable as in Hirtle et al. (2016). Essentially, I construct a measure of regulatory scrutiny (*Supervisory Attention)* by exploiting the geographic assignment of BHCs to Federal Reserve districts.[32] I use a dummy variable that takes a value of one for the top 5 banks in each of the 12 Federal Reserve districts in each year and remains zero otherwise. While the distribution of BHCs varies significantly across districts in terms of asset size, complexity, geographic diversification, and numerous other business characteristics, Hirtle et al. (2016) show that in each district, the largest institutions receive more supervisory attention. I then interact the scrutiny variable with the measures of board independence and financial expertise.

4.5.1 Target Capital Ratio, Speed of Adjustment and Regulatory Scrutiny

I start the investigation of the role of regulatory scrutiny via the Dodd-Frank Act by extending the target capital equation and the speed of adjustment equations for banks above and below the target with the addition of a dummy (*Treated)* equal to 1 for banks above the size threshold over the sample period and a dummy (*Post)* equal to 1 from 2011 to 2014. I interact these dummies with the governance variables. The key coefficients are the triple interaction terms between *Treated*, *Post* and the board structure variables. Positive values of this interaction term indicate an increase in the target capital (speed of adjustment) for

[32] The structure of Federal Reserve System is retrieved from https://www.federalreserve.gov/aboutthefed/structure-federal-reserve-system.htm

treated banks after the implementation of the Act in the presence of an increase in the share of (a certain type of) independent directors.

Insert Table 4-6 Here

Panel A of Table 4-6 reports the regression results with column (1) referring to the target equation and the remaining two columns to the speed of adjustment equation (banks below and above the target ratio respectively). The results support a considerable influence of regulatory scrutiny on how boards impact on a bank's capital management. Specifically, I find that the triple interaction term for both governance variables is positive in the target and in the speed of adjustment regression for undercapitalized (overcapitalized) banks. In other words, in treated banks the adoption of the Dodd-Frank Act induces an increase in the target capital ratio and in the adjustment process in banks with more independent boards and with a larger share of financial experts among independent directors.

In Panel B I present a more comprehensive picture of the evolution of the capital management of treated and non-treated banks with the implementation of the Dodd-Frank Act. For each governance variable I compute the impact on the target capital ratio and the speed of adjustment before and after the act for treated and non-treated banks. Again, this analysis highlights a significant shift in the impact of board structure on a bank's capital management, with a stronger change for directors with financial expertise.

In Table 4-7, I next repeat the analysis using the second setting to quantify variation in regulatory scrutiny. The regression results reported in column (1) in Panel A again show that independent boards and financial expert directors respond to an increase in regulatory scrutiny by increasing a bank's target capital ratio. Similarly, the evidence from the speed of adjustment analysis shows that in the presence of an increase in regulatory scrutiny, both

independent and financial expert independent directors increase the speed of adjustment when banks are undercapitalized.

I also find that in the presence of greater regulatory scrutiny overcapitalized banks with greater board independence make a quick downward adjustment towards the target capital ratio. These results suggest that regulators are less concerned about the overcapitalized banks and let such banks revert to the target capital ratio quickly irrespective of the degree of the regulatory scrutiny. These findings also complement the existing literature which suggest regulators are primarily concerned about the undercapitalized banks which has potential to damage the stability of the financial system (Anginer et al., 2016).

However, the marginal effects reported in Panel B show that only in the case of financial expert directors is there a positive relationship both in the target and the speed of adjustment equations in banks with a stronger regulatory oversight.

Insert Table 4-7 Here

Overall, regulatory scrutiny matters for how board structures impact on a bank's target capital and speed of adjustment. More importantly, independent directors with financial expertise seem to be more likely to respond to greater regulatory scrutiny with a capital adjustment process that becomes more aligned to the regulatory objectives of preserving a bank's capital adequacy, especially when banks are undercapitalized.

Overall, internal governance mechanisms via board structure and regulation play complementary roles in a bank's capital management. Consequently, reforms that aim at increasing financial expertise in bank boards are likely to be a more effective tool in maintaining adequately capitalized banks if accompanied by a stronger regulatory oversight.

4.5.2 Source of Adjustment and Regulatory Scrutiny

I next analyses the impact of regulatory scrutiny on the sources of adjustment. I initially focus on the Dodd-Frank Act and report the results of these tests in Table 4-8. Notably, I do not replicate the approach in section 4.4, as in this setting it would require the interactions of four variables and, therefore, making the interpretation of the findings less intuitive. In contrast, for each adjustment strategy I estimate the models separately for treated and non-treated banks for the pre and post-Dodd Frank Act period.[33] I then test if there are significant differences when I compare the coefficients of the interaction between the governance variables and Deficit (Surplus) obtained from the models estimated for the two sub-periods for treated and untreated banks.

Panel A (B) of Table 4-8 reports the findings for equity (asset) adjustments. Panel A shows that for undercapitalized banks I observe that an increase in board independence and financial expertise favour equity issuance more in treated banks than in the control group. Similarly, for overcapitalized I observe that treated banks become less likely to achieve the target capital ratio by decreasing equity as compared to non-treated banks when they have more independent boards and more financial experts among the independent directors. In Panel B, focusing on asset adjustments, I do not find major differences between treated and untreated banks. The only main difference refers to a lower use of security sales by treated banks.

Insert Table 4-8 Here

[33] I report the full specifications in Table 4-12 in the Appendix.

Overall, the results indicate that an increase in regulatory scrutiny is accompanied by a larger use of equity issuance in undercapitalized banks when boards are more independent and especially when independent directors have financial expertise. Furthermore, these directors become less likely to favour security sales when banks are undercapitalized.

Insert Table 4-9 Here

I next analyses the impact of regulatory scrutiny on the sources of adjustment using the supervisory attention measure. To this end, I extend equation (6) with interaction terms between Deficit (Surplus) and each of the bank level measures of supervisory attention. Table 4-9 reports the results. I still find that an increase in regulatory scrutiny favours the use of equity issuance in undercapitalized banks with more independent directors, especially if these directors have financial expertise.

To summarize, using alternative settings to explore exogenous variation in regulatory scrutiny, I show that more regulatory scrutiny leads independent directors (especially with financial expertise) to implement recapitalization choices that allow a faster adjustment process when a bank is undercapitalized.

4.6 Conclusions

The study shows that the board structures advocated by regulators and policy makers in the aftermath of the global crisis (that is, more independent boards and boards with a larger proportion of financial experts) do not facilitate a bank's capital management that is in line with the regulatory objective in terms of bank capital. In fact, I find that banks with more independent boards opt for a lower target capital ratio and an increase (decrease) in their speed of adjustment towards the chosen target when they are over (under) capitalized.

Nevertheless, differently from what is assumed by previous studies on bank governance and capital ratios (Anginer et al., 2016; 2018), not all independent directors share similar preferences in terms of how a bank should manage its capital structure. In particular, adding independent directors with financial expertise to the board further lowers the target capital ratio, although it also leads to closing the gap between the target and actual capital ratio at a significantly faster (slower) rate when the bank is operating below (above) its target capital ratio. This seems to be motivated by financial expert directors (more than other directors) being likely to rely on issuing equity to ensure a quick adjustment process. More generally, the findings seem to deny the view that financial expert directors are driven by risk-shifting incentives. In contrast, they appear to see a low equity ratio as being preferable to run a banking business as indicated by recent theory models on banks (see, for instance, DeAngelo and Stulz, 2015).

Finally, I document that the results vary with the degree of regulatory scrutiny on banks and highlight key complementarities between bank internal governance and regulation. Specifically, I observe that the choices of independent directors, and in particular the choices of directors with financial expertise in terms of capital management, become more aligned with the objective of avoiding conditions of undercapitalization when regulatory scrutiny increases. This, therefore, implies that adding independent directors to bank boards, and in particular directors with financial expertise, could be beneficial in terms of bank capital management only in banks that are subject to a growing regulatory oversight.

Table 4–1: Sample Distribution by Year

This table reports the average number of bank observations per year for the entire sample period.

Year (1)	Number of Banks each year (2)	% Observations (3)
2001	242	4.913%
2002	266	5.400%
2003	269	5.461%
2004	315	6.395%
2005	356	7.227%
2006	396	8.039%
2007	400	8.120%
2008	412	8.364%
2009	404	8.201%
2010	372	7.552%
2011	383	7.775%
2012	370	7.511%
2013	372	7.552%
2014	372	7.552%
Total	**4,929**	**100.0%**
Total Unique Banks	**637**	

Table 4–2: Summary Statistics and Variable Description

The table provides the description and summary statistics of the explanatory and control variables employed in the study. All variables, except dummy variables, are winsorized at the 1% and 99% levels.

		N	Mean	Median	SD	p1	p99
Panel A: Dependent variable							
1.Equity Ratio	Total Equity to Total Assets.	4,929	0.098	0.094	0.034	0.041	0.208
Panel B: Governance Variables							
2.Board Independence	The ratio between the number of independent directors and board size.	4,929	0.768	0.800	0.134	0.333	0.938
3. Financial Independent Directors	The ratio between the number of independent financial expert directors and the number of independent directors.	4,929	0.414	0.428	0.301	0.000	0.851
4.CEO Duality	Dummy variable equal to 1 if the CEO is also the chairman of the board.	4,929	0.456	0.000	0.498	0.000	1.000
5.Board Age	Log of average age of directors on board	4,929	4.105	4.105	0.061	3.938	4.260
6.Board Size	Log transformation of the total number of directors on the board.	4,929	2.361	2.397	0.298	1.609	3.044
Panel C: Control Variables							
Bank Fundamentals							
7.Tangibility	The ratio between fixed to total assets.	4,929	0.016	0.015	0.008	0.001	0.044
8.Non-Performing Loans	The ratio of non-performing loans to net loans.	4,929	0.007	0.003	0.010	-0.003	0.056
9.Non-Interest Income	The ratio of non-interest income divided by non-interest income plus net interest income.	4,929	0.233	0.220	0.128	0.035	0.677
10.ROA	The ratio between net income to total assets.	4,929	0.006	0.008	0.009	-0.039	0.021
11.Dividend to Assets	The ratio of dividends to total assets.	4,929	0.003	0.003	0.002	0.000	0.010
12.Size	The log transformation of total assets measured in millions of US dollars.	4,929	7.464	7.139	1.500	4.968	12.515
13.Growth Opportunities	The ratio between market to book value.	4,929	1.612	1.041	3.389	0.000	12.726
14.Ratings	S&P credit ratings ranging from 1 to 9 (no ratings = 1, D = 2 → A+ = 9,).	4,929	4.774	5.000	2.129	1.000	9.000
15.Analysts	Log of the number of analysts	4,929	0.739	0.000	0.969	0.000	3.222
16.Institutional Ownership	Total Institutional Ownership (% of Shares Outstanding)	4,929	0.307	0.238	0.836	0.000	0.889
17.TARP Bank	Dummy variable equal to 1 for the years during which bank remained under the TARP program.	4,929	0.352	0.000	0.477	0.000	1.000
18.Effective Tax Rate	The ratio of income tax paid to pre-tax income.	4,929	0.298	0.300	0.077	0.016	0.446
Panel D: Macro-Economic Environment							
19.GDP Growth	Change in Real GDP (US Dollars).	4,929	0.018	0.022	0.016	-0.027	0.040
20.Inflation	Change in the Consumer Price Index (%).	4,929	0.023	0.026	0.011	-0.035	0.038
21.Crisis	Dummy variable equal to 1 for the period 2007 - 2009	4,929	0.227	0.000	0.417	0.000	1.000

Table 4–3: The Influence of Board Independence and Financial Expertise on Target Capital Ratio

This table reports the results from variable Speed of Adjustment model described in section 4.3.2. The first stage results are presented in column (1) in Panel A. A partial adjustment model has been used to produce the estimates of the determinants of the Tier 1 capital ratio under a constant adjustment speed framework $CR_{i,t} = \lambda\alpha K_{i,t-1} + (1-\lambda)CR_{i,t-1} + \varepsilon_{i,t}$. The model in column (2) presents the estimates of the Long-term Coefficient. Panel B reports the summary statistics on target capital and deviations from the target for below and above target capital banks in the sample. **Equity$_{t-1}$** is the lagged dependent variable and calculated as total equity to total assets. **Board Independence** is the ratio between the number of independent directors and board size, **Financial Independent Directors** is the ratio between the number of independent financial expert directors and the number of independent directors, **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board, **Board Age** Log of average age of directors on board, **Board Size** is the log transformation of the total number of directors on the board, **Tangibility** is the ratio between fixed to total assets, **Non-Performing Loans** is the ratio of non-performing loans to net loans, **Non-Interest Income** is the ratio of non-interest income to non-interest income plus net interest income, **ROA** is the ratio between earnings before interest and tax to total assets, **Dividend to Assets** is the ratio of dividends to total assets, **Growth Opportunities** is the ratio between market to book value, **Size** is the log transformation of total assets measured in millions of US dollars, **Ratings** is the S&P credit ratings ranging from 1 to 9 (1= D and 9 = A+), **Analysts** is the log of the number of analysts, **Institutional Block Holders** is Total Institutional Ownership (% of Shares Outstanding), **TARP Bank** is a dummy variable equal to 1 in the year a bank has received TARP funds**, Effective Tax Rate** is the ratio between total income tax paid to total income before tax, **GDP Growth** is the real GDP growth rate in (US Dollars), **Inflation** is the consumer price index, **Crisis** is the dummy variable equals to 1 for the period 2007 – 2009. The model is estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. All explanatory variables, except the crisis dummy, are lagged one-year. Time dummies are included in the model. m_2 is the serial correlation tests of order *2* using residuals in first differences. The Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel A: Determinants of the Target Capital Ratio

	Short-term Coefficients	Long-term Coefficients
	(1)	(2)
Equity $_{t-1}$	0.812***	
	(0.001)	
Board Independence $_{t-1}$	-0.005***	-0.027***
	(0.000)	(0.000)
Financial Independent Directors $_{t-1}$	-0.001***	-0.005***
	(0.000)	(0.000)
CEO Duality $_{t-1}$	0.000***	0.000***
	(0.000)	(0.000)
Board Age$_{t-1}$	0.003***	0.015*
	(0.000)	(0.000)
Board Size $_{t-1}$	0.000*	0.002***
	(0.000)	(0.002)
Tangibility $_{t-1}$	-0.090***	-0.479***
	(0.002)	(0.000)
Non-Performing Loans $_{t-1}$	0.043***	0.227***
	(0.000)	(0.000)
Non-Interest Income $_{t-1}$	0.008***	0.043***
	(0.000)	(0.000)
ROA $_{t-1}$	-0.430***	-2.287***
	(0.001)	(0.000)
Dividend to Assets $_{t-1}$	0.581	3.095*
	(1.003)	(0.000)
Growth Opportunities $_{t-1}$	0.000**	0.001***
	(0.000)	(0.000)
Size $_{t-1}$	-0.001***	-0.003***
	(0.000)	(0.000)
Ratings $_{t-1}$	-0.000***	-0.000**
	(0.000)	(0.000)
Analysts $_{t-1}$	0.002	0.012***
	(0.002)	(0.000)
Institutional Ownership $_{t-1}$	-0.001***	-0.007***
	(0.000)	(0.000)
TARP Bank	0.006***	0.030***
	(0.000)	(0.000)
Effective Tax Rate $_{t-1}$	-0.007*	-0.036***
	(0.003)	(0.000)

Table 4-3: The Influence of Board Independence and Financial Expertise on Target Capital Ratio *(Continued)*

This table reports the results from variable Speed of Adjustment model described in section 4.3.2. The first stage results are presented in column (1) in Panel A. A partial adjustment model has been used to produce the estimates of the determinants of the Tier 1 capital ratio under a constant adjustment speed framework $CR_{i,t} = \lambda\alpha K_{i,t-1} + (1-\lambda)CR_{i,t-1} + \varepsilon_{i,t}$. The model in column (2) presents the estimates of the Long-term Coefficient. Panel B reports the summary statistics on target capital and deviations from the target for below and above target capital banks in the sample. **Equity$_{t-1}$** is the lagged dependent variable and calculated as total equity to total assets. **Board Independence** is the ratio between the number of independent directors and board size, **Financial Independent Directors** is the ratio between the number of independent financial expert directors and the number of independent directors, **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board, **Board Age** Log of average age of directors on board, **Board Size** is the log transformation of the total number of directors on the board, **Tangibility** is the ratio between fixed to total assets, **Non-Performing Loans** is the ratio of non-performing loans to net loans, **Non-Interest Income** is the ratio of non-interest income to non-interest income plus net interest income, **ROA** is the ratio between earnings before interest and tax to total assets, **Dividend to Assets** is the ratio of dividends to total assets, **Growth Opportunities** is the ratio between market to book value, **Size** is the log transformation of total assets measured in millions of US dollars, **Ratings** is the S&P credit ratings ranging from 1 to 9 (1= D and 9 = A+), **Analysts** is the log of the number of analysts, **Institutional Block Holders** is Total Institutional Ownership (% of Shares Outstanding), **TARP Bank** is a dummy variable equal to 1 in the year a bank has received TARP funds**, Effective Tax Rate** is the ratio between total income tax paid to total income before tax, **GDP Growth** is the real GDP growth rate in (US Dollars), **Inflation** is the consumer price index, **Crisis** is the dummy variable equals to 1 for the period 2007 – 2009. The model is estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. All explanatory variables, except the crisis dummy, are lagged one-year. Time dummies are included in the model. m_2 is the serial correlation tests of order *2* using residuals in first differences. The Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel A: Determinants of the Target Capital Ratio

	Short-term Coefficients	Long-term Coefficients
	(1)	(2)
GDP Growth $_{t-1}$	0.000	0.000***
	(0.011)	(0.000)
Inflation $_{t-1}$	0.001***	0.005***
	(0.000)	(0.000)
Crisis	-0.004	-0.021***
	(0.005)	(0.000)
Constant	0.049**	0.260***
	(0.020)	(0.000)
Observations	4,929	
Year Fixed Effects	Yes	
Number of Instruments	65	
m_2 (P-value)	0.313	
Hansen (P-Value)	0.300	

Panel B: Target Capital and Deviation from the Target

	N	Mean	Median	SD	p1	p99
Target Capital Ratio	4,929	0.100	0.099	0.019	0.064	0.148
Deviation from the Target:						
Full Sample	4,929	0.002	0.004	0.035	-0.106	0.076
Below Target Banks	2,736	0.022	0.018	0.019	0.000	0.085
Above Target Banks	2,193	-0.026	-0.017	0.034	-0.135	-0.000

Table 4–4: The Influence of Board Independence and Financial Expertise on the Speed of Adjustment

This table reports the results from variable Speed of Adjustment model described in section 4.3.2. The first stage results are presented in column (1) of Table 4-3. The models in columns (1) and (2) present the estimates from the second stage of the analysis for the below and above target capital banks respectively and are estimated using the pooled OLS regression $CR_{i,t} - CR_{i,t-1} = (\varrho Z_{i,t-1})\widehat{G_{i,t}} + \gamma Year_t + \delta_{i,t}$. Column (3) provides the results on the statistical significance of the difference between the coefficients of the two models presented in columns (1) and (2). **Board Independence** is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between the number of independent financial expert directors and the number of independent directors, **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board, **Board Age** Log of average age of directors on board, **Board Size** is the log transformation of the total number of directors on the board, **Tangibility** is the ratio between fixed to total assets, **Non-Performing Loans** is the ratio of non-performing loans to net loans, **Non-Interest Income** is the ratio of non-interest income to non-interest income plus net interest income, **ROA** is the ratio between earnings before interest and tax to total assets, **Dividend to Assets** is the ratio of dividends to total assets, **Growth Opportunities** is the ratio between market to book value, **Size** is the log transformation of total assets measured in millions of US dollars, **Ratings** is the S&P credit ratings ranging from 1 to 9 (1= D and 9 = A+), **Analysts** is the log of the number of analysts, **Institutional Block Holders** is Total Institutional Ownership (% of Shares Outstanding), **TARP Bank** is a dummy variable equal to 1 in the year a bank has received TARP funds, **Effective Tax Rate** is the ratio between total income tax paid to total income before tax, **GDP Growth** is the real GDP growth rate in (US Dollars), Inflation is the consumer price index, **Crisis** is the dummy variable equals to 1 for the period 2007 – 2009. All explanatory variables, except for the crisis dummy, are lagged one-year. Time dummies are included in the model. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Below Target Banks	**Above Target Banks**	**(1) – (2)**
	(1)	(2)	(3)
Board Independence $_{t-1}$	-0.190***	0.100**	-0.290***
	(0.065)	(0.031)	
Financial Expertise $_{t-1}$	0.027***	-0.003***	0.030**
	(0.006)	(0.000)	
CEO Duality $_{t-1}$	-0.023	-0.001**	-0.022***
	(0.017)	(0.000)	
Board Age$_{t-1}$	-0.001	0.002	-0.003
	(0.002)	(0.001)	
Board Size $_{t-1}$	-0.024	-0.066**	0.042***
	(0.029)	(0.030)	
Tangibility $_{t-1}$	-3.543***	0.953	-4.496***
	(0.873)	(0.817)	
Non-Performing Loans $_{t-1}$	1.090***	-0.416	1.506***
	(0.268)	(0.310)	
Non-Interest Income $_{t-1}$	0.140**	-0.499***	0.639***
	(0.068)	(0.080)	
ROA $_{t-1}$	-6.434***	13.207***	-19.641***
	(0.807)	(1.134)	
Dividend to Assets $_{t-1}$	-0.058	6.092*	-6.150***
	(3.780)	(3.180)	
Growth Opportunities $_{t-1}$	0.004***	-0.050***	0.054**
	(0.001)	(0.005)	
Size $_{t-1}$	-0.044***	0.049***	-0.093***
	(0.011)	(0.011)	
Ratings $_{t-1}$	0.001	0.026***	-0.025***
	(0.005)	(0.003)	
Analysts $_{t-1}$	-0.008	-0.031**	0.023***
	(0.016)	(0.014)	
Institutional Ownership $_{t-1}$	-0.184***	0.405***	-0.589***
	(0.053)	(0.051)	
TARP Bank	0.020*	-0.425***	0.445***
	(0.010)	(0.040)	
Effective Tax Rate $_{t-1}$	-0.155	0.043	-0.198**
	(0.105)	(0.107)	
GDP Growth $_{t-1}$	0.008**	0.014	-0.006***
	(0.002)	(0.011)	
Inflation $_{t-1}$	0.027	-0.007	0.034
	(0.023)	(0.013)	
Crisis	-0.223***	0.124***	-0.347***
	(0.057)	(0.036)	
Constant	0.191***	0.110	0.081***
	(0.001)	(0.001)	
Observations	2,736	2,193	
R-squared	0.082	0.227	
Year Fixed Effects	Yes	Yes	

Table 4–5: The Influence of Board Independence and Financial Expertise on the Sources of Adjustments

This table reports the estimates of the determinants of different sources of adjustment towards the target ratio. I explore two major sources of adjustment: equity adjustments in columns (1) and (2) and asset adjustments in columns (3) and (4). **Δ Equity** is the annual change in equity divided by average assets. **Δ Retained Earnings** is the annual change in the retained earnings divided by average assets. Banks can close the gap by adjusting their securities (other earning assets) and/or loans - estimates are reported in columns (3) an (4) respectively. **Δ Securities** is the other earning assets calculated as annual change in total non-loan assets divided by average assets. **Δ Loans** is the annual change in net loans divided by average assets. **Deficit** is the absolute value of the gap between the target and actual capital ratio if the bank is below its target, otherwise it is equal to 0. **Surplus** is the absolute value of the gap between the target and actual capital ratio if the bank is above its target otherwise equal to 0. **Board Independence** is the ratio between the number of independent directors and the total board members, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board, **Board Age** Log of average age of directors on board, **Board Size** is the log transformation of the total number of directors on the board, **Tangibility** is the ratio between fixed to total assets, **Non-Performing Loans** is the ratio of non-performing loans to net loans, **Non-Interest Income** is the ratio of non-interest income to non-interest income plus net interest income, **ROA** is the ratio between earnings before interest and tax to total assets, **Dividend to Assets** is the ratio of dividends to total assets, **Growth Opportunities** is the ratio between market to book value, **Size** is the log transformation of total assets measured in millions of US dollars, **Ratings** is the S&P credit ratings ranging from 1 to 9 (1= D and 9 = A+), **Analysts** is the log of the number of analysts, **Institutional Block Holders** is Total Institutional Ownership (% of Shares Outstanding), **TARP Bank** is a dummy variable equal to 1 in the year a bank has received TARP funds, **Effective Tax Rate** is the ratio between total income tax paid to total income before tax, **GDP Growth** is the real GDP growth rate in (US Dollars), Inflation is the consumer price index, **Crisis** is the dummy variable equals to 1 for the period 2007 – 2009. The model is estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. Time dummies are included in the model. All models include the set of control variables as of table 4-3. M_2 is the serial correlation tests of order *2* using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Equity Adjustment		Asset Adjustment	
	Δ Equity	Δ Retained Earnings	Δ Securities	Δ Loans
	(1)	(2)	(3)	(4)
Board Independence $_{t-1}$	-0.053***	0.004	0.007	0.011***
	(0.006)	(0.004)	(0.010)	(0.001)
Financial Expertise $_{t-1}$	0.012***	-0.083***	0.021*	-0.010***
	(0.001)	(0.001)	(0.011)	(0.000)
Deficit $_{t-1}$	0.012*	0.478***	-0.584***	-0.079*
	(0.007)	(0.015)	(0.011)	(0.040)
Surplus $_{t-1}$	-0.053***	-0.819***	0.576*	0.089
	(0.006)	(0.027)	(0.214)	(0.108)
Deficit * Board Independence	0.363	0.508***	-1.270***	0.040***
	(0.429)	(0.055)	(0.025)	(0.015)
Surplus * Board Independence	-0.797***	-2.281***	1.335	0.199***
	(0.025)	(0.039)	(1.022)	(0.007)
Deficit * Financial Expertise	1.190***	-5.628	-0.343***	0.168
	(0.050)	(7.078)	(0.034)	(0.119)
Surplus * Financial Expertise	0.618	-1.129***	0.912***	0.074***
	(0.651)	(0.036)	(0.041)	(0.015)
CEO Duality $_{t-1}$	0.009	-0.063	-0.012*	-0.006
	(0.024)	(0.042)	(0.007)	(0.005)
Board Age$_{t-1}$	0.007**	0.005	-0.000	-0.000
	(0.003)	(0.006)	(0.001)	(0.001)
Board Size $_{t-1}$	-0.039	0.078	0.009	0.004
	(0.044)	(0.080)	(0.013)	(0.008)
Tangibility $_{t-1}$	2.995**	2.481	1.061**	-0.008
	(1.390)	(2.681)	(0.417)	(0.271)
Non-Performing Loans $_{t-1}$	1.162**	-0.200	-0.259	-0.941***
	(0.543)	(0.808)	(0.162)	(0.101)
Non-Interest Income $_{t-1}$	-0.066	-0.115	-0.066*	-0.027
	(0.113)	(0.190)	(0.034)	(0.021)
ROA $_{t-1}$	14.374***	-0.838	3.207***	1.708***
	(2.130)	(2.842)	(0.631)	(0.370)
Dividend to Assets $_{t-1}$	-11.403**	-8.921	-4.356***	-3.023***
	(5.388)	(9.276)	(1.625)	(1.026)
Growth Opportunities $_{t-1}$	-0.003	0.003	0.001	0.001
	(0.004)	(0.006)	(0.001)	(0.001)
Size $_{t-1}$	-0.026	-0.001	-0.013***	-0.015***
	(0.017)	(0.031)	(0.005)	(0.003)
Ratings $_{t-1}$	-0.011*	0.029**	-0.004**	0.000
	(0.006)	(0.012)	(0.002)	(0.001)

Table 4-5: The Influence of Board Independence and Financial Expertise on the Sources of Adjustments
(*Continued*)

This table reports the estimates of the determinants of different sources of adjustment towards the target ratio. I explore two major sources of adjustment: equity adjustments in columns (1) and (2) and asset adjustments in columns (3) and (4). **Δ Equity** is the annual change in equity divided by average assets. **Δ Retained Earnings** is the annual change in the retained earnings divided by average assets. Banks can close the gap by adjusting their securities (other earning assets) and/or loans - estimates are reported in columns (3) an (4) respectively. **Δ Securities** is the other earning assets calculated as annual change in total non-loan assets divided by average assets. **Δ Loans** is the annual change in net loans divided by average assets. **Deficit** is the absolute value of the gap between the target and actual capital ratio if the bank is below its target, otherwise it is equal to 0. **Surplus** is the absolute value of the gap between the target and actual capital ratio if the bank is above its target otherwise equal to 0. **Board Independence** is the ratio between the number of independent directors and the total board members, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board, **Board Age** Log of average age of directors on board, **Board Size** is the log transformation of the total number of directors on the board, **Tangibility** is the ratio between fixed to total assets, **Non-Performing Loans** is the ratio of non-performing loans to net loans, **Non-Interest Income** is the ratio of non-interest income to non-interest income plus net interest income, **ROA** is the ratio between earnings before interest and tax to total assets, **Dividend to Assets** is the ratio of dividends to total assets, **Growth Opportunities** is the ratio between market to book value, **Size** is the log transformation of total assets measured in millions of US dollars, **Ratings** is the S&P credit ratings ranging from 1 to 9 (1= D and 9 = A+), **Analysts** is the log of the number of analysts, **Institutional Block Holders** is Total Institutional Ownership (% of Shares Outstanding), **TARP Bank** is a dummy variable equal to 1 in the year a bank has received TARP funds, **Effective Tax Rate** is the ratio between total income tax paid to total income before tax, **GDP Growth** is the real GDP growth rate in (US Dollars), Inflation is the consumer price index, **Crisis** is the dummy variable equals to 1 for the period 2007 – 2009. The model is estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. Time dummies are included in the model. All models include the set of control variables as of table 4-3. M_2 is the serial correlation tests of order *2* using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Equity Adjustment		Asset Adjustment	
	Δ Equity	Δ Retained Earnings	Δ Securities	Δ Loans
	(1)	(2)	(3)	(4)
Analysts $_{t-1}$	0.053**	0.057	0.017**	0.015***
	(0.024)	(0.041)	(0.007)	(0.005)
Institutional Ownership $_{t-1}$	-0.013	-0.128	0.046*	0.062***
	(0.080)	(0.140)	(0.024)	(0.015)
TARP Bank	-0.024	-0.063	-0.009	-0.004
	(0.039)	(0.056)	(0.012)	(0.007)
Effective Tax Rate $_{t-1}$	0.209	0.518**	0.127***	0.042
	(0.156)	(0.223)	(0.047)	(0.028)
GDP Growth $_{t-1}$	0.005	0.165	0.140***	0.026
	(0.095)	(0.117)	(0.029)	(0.016)
Inflation $_{t-1}$	-0.065	-0.338*	-0.252***	-0.098***
	(0.165)	(0.199)	(0.050)	(0.028)
Crisis	0.418	0.933	1.006***	0.131
	(0.560)	(0.683)	(0.168)	(0.095)
Observations	4,929	4,929	4,929	4,929
Control Variable	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Number of Instruments	86	88	86	86
m_2 (p-value)	0.109	0.220	0.212	0.271
Hansen (p-value)	0.417	0.300	0.317	0.520

Table 4–6: Director Expertise and a Shock to Regulatory Scrutiny due to the Dodd-Frank Act

This table reports estimates on the impact of Dodd-Frank Act 2010 on board independence and independent directors' financial expertise on the capital ratio speed of adjustment. The first stage results are presented in column (1) of panel A. A partial adjustment model has been used to produce the estimates of the determinants of the Tier 1 capital ratio under a constant adjustment speed framework $CR_{i,t} = (\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \delta X_{i,t-1} + \theta MEco_{t-1} + \rho Year_t + \eta_i) + (1-\lambda) CR_{i,t-1} + \varepsilon_{i,t}$. Columns (2) and (3) of Panel A represent the estimates from the second stage analysis of the variable speed of adjustment model for below and above target capital banks respectively and is estimated using a pooled OLS regression $\Delta CR_{i,t} = \chi[(\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \xi Z_{i,t-1}) \widehat{DIFF}_{i,t-1}] + \psi Year_t + \mathcal{E}_{i,t}$. **Post** is a Dummy variable that takes the value of one for the years 2011 – 2014. **Treat** is a dummy variable that takes the value of one when a bank has an asset value between $10 billion and $20 billion and remains zero for banks with assets between $1 billion and $7 billion. **Board Independence** is the ratio between the total number of independent directors and board size, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. The model in column (1) is estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. Time dummies and control variables are included in all models. M_2 is the serial correlation tests of order *2* using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Determinants of the Capital Ratio	**Determinants of the Speed of Adjustment**	
		Banks Below the Target	Banks Above the Target
	(1)	(2)	(3)
Panel A: Regression Analysis			
β_0Equity $_{t-1}$	0.732***		
	(0.001)		
β_1 Board Independence $_{t-1}$	-0.011***	-0.004*	0.236**
	(0.000)	(0.001)	(0.112)
β_2Financial Expertise $_{t-1}$	-0.005***	0.027**	-0.116***
	(0.000)	(0.010)	(0.044)
β_3Post (P)	0.006*	0.098*	0.004
	(0.004)	(0.041)	(0.278)
β_4Treat (T)	0.030**	-0.189	0.035
	(0.014)	(0.178)	(0.031)
β_5Post*Treat (PT)	0.027***	0.301**	0.840*
	(0.000)	(0.133)	(0.414)
β_6 Board Independence *Post	0.016*	0.045	-0.023**
	(0.009)	(0.194)	(0.007)
β_7 Financial Expertise *Post	0.007	0.136**	0.016
	(0.010)	(0.060)	(0.098)
β_8 Board Independence *Treat	0.003***	0.155	0.456**
	(0.000)	(0.272)	(1.092)
β_9 Financial Expertise *Treat	-0.002***	0.056**	0.119*
	(0.000)	(0.020)	(0.044)
β_{10} **Board Independence *PT**	0.008***	0.627**	0.354**
	(0.000)	(0.267)	(0.175)
β_{11} **Financial Expertise *PT**	0.005***	0.719*	0.517*
	(0.000)	(0.352)	(0.252)
Observations	4,929	2,619	2,310
R-squared		0.094	0.174
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Number of Instruments	106		
m_2 (p-value)	0.251		
Hansen (P-Value)	0.410		

Table 4-6: Director Expertise and a Shock to Regulatory Scrutiny due to the Dodd-Frank Act (Continued)

This table reports estimates on the impact of Dodd-Frank Act 2010 on board independence and independent directors' financial expertise on the capital ratio speed of adjustment. The first stage results are presented in column (1) of panel A. A partial adjustment model has been used to produce the estimates of the determinants of the Tier 1 capital ratio under a constant adjustment speed framework $CR_{i,t} = (\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \delta X_{i,t-1} + \theta MEco_{t-1} + \rho Year_t + \eta_i) + (1-\lambda) CR_{i,t-1} + \varepsilon_{i,t}$. Columns (2) and (3) of Panel A represent the estimates from the second stage analysis of the variable speed of adjustment model for below and above target capital banks respectively and is estimated using a pooled OLS regression $\Delta CR_{i,t} = \chi[(\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \xi Z_{i,t-1}) \widehat{DIFF}_{i,t-1}] + \psi Year_t + \mathcal{E}_{i,t}$. **Post** is a Dummy variable that takes the value of one for the years 2011 – 2014. **Treat** is a dummy variable that takes the value of one when a bank has an asset value between $10 billion and $20 billion and remains zero for banks with assets between $1 billion and $7 billion. **Board Independence** is the ratio between the total number of independent directors and board size, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. Time dummies and control variables are included in all models. M_2 is the serial correlation tests of order *2* using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel B: Marginal Effects

	Determinants of the Capital Ratio	**Determinants of the Speed of Adjustment**	
		Banks Below the Target	Banks Above the Target
	(1)	(2)	(3)
B1: Board Independence			
Pre Dodd-Frank Act			
Non-treated			
β_1	-0.011***	-0.004*	0.236**
Treated			
$\beta_1 + \beta_8$	-0.008*	0.151***	0.362**
Post Dodd-Frank Act			
Non-Treated			
$\beta_1 + \beta_6$	0.005*	0.041***	-0.117*
Treated			
$\beta_1 + \beta_6 + \beta_8 + \beta_{10}$	0.016***	0.823***	0.693***
B2: Financial Expertise			
Pre Dodd-Frank Act			
Non-Treated			
β_2	-0.005***	0.027**	-0.116***
Treated			
$\beta_2 + \beta_9$	-0.007***	0.083**	0.003***
Post Dodd-Frank Act			
Non-Treated			
$\beta_2 + \beta_7$	0.002***	0.163*	-0.100***
Treated			
$\beta_2 + \beta_7 + \beta_9 + \beta_{11}$	0.005*	0.938***	0.536***

Table 4–7: Board Structure and Regulatory Scrutiny - Target Capital and Speed of Adjustment

This table reports estimates on the joint impact of regularity scrutiny (supervisory attention) and independent directors' financial expertise on the capital ratio speed of adjustment. Panels A, report results for the impact of supervisory attention on the bank capital ratio speed of adjustment, respectively. The first stage results are presented in column (1). A partial adjustment model has been used to produce the estimates of the determinants of Tier 1 capital ratio under a constant adjustment speed framework $CR_{i,t} = \lambda\alpha K_{i,t-1} + (1-\lambda)CR_{i,t-1} + \varepsilon_{i,t}$. All models in columns (2) and (3) represent the estimates from the second stage analysis of the variable speed of adjustment model and is estimated using a pooled OLS regression $CR_{i,t} - CR_{i,t-1} = (\varrho Z_{i,t-1})\widehat{G_{i,t}} + \gamma Year_t + \delta_{i,t}$. **Supervisory Attention** is dummy variable that takes the value of one in each year for the top 5 largest BHCs in each district. **Board Independence** is the ratio between the number of independent directors and board size. **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. All explanatory variables except the crisis dummy are lagged one-year. Time dummies are included in the model. Time dummies and control variables are included in all models. The model in column (1) estimated using the System GMM specification with Windmeijer correction described in section 4.2.3.. M_2 is the serial correlation tests of order *2* using residuals in first differences. The Hansen test is the test of over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel A: Regression Analysis

	Determinants of the Capital Ratio	**Determinants of the Speed of Adjustment**	
		Banks Below the Target	Banks Above the Target
	(1)	(2)	(3)
β_0Equity $_{t-1}$	0.807***		
	(0.001)		
β_1Board Independence $_{t-1}$	-0.005***	-0.137**	0.101*
	(0.000)	(0.071)	(0.050)
β_2Financial Expertise $_{t-1}$	-0.001***	0.002**	-0.014*
	(0.000)	(0.001)	(0.006)
β_3Regulatory Scrutiny	0.006***	0.104**	-0.205
	(0.000)	(0.054)	(0.175)
β_4Board Independence * Supervisory Attention	0.003***	0.255**	0.501**
	(0.000)	(0.128)	(0.240)
β_5 Financial Expertise* Supervisory Attention	0.002***	0.083**	-0.056
	(0.000)	(0.040)	(0.098)
Observations	4,929	2,700	2,229
R-squared		0.497	0.664
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Number of Instruments	96		
m_2 (p-value)	0.317		
Hansen (P-Value)	0.350		
Panel B: Marginal Effects			
B1: Board Independence			
β_1 Low Supervisory Attention	-0.005***	-0.137**	0.101*
$\beta_1 + \beta_4$ High Supervisory Attention	-0.002***	0.118**	0.602**
B2: Financial Expertise			
β_2 Low Supervisory Attention	-0.001***	0.002**	-0.014*
$\beta_2 + \beta_5$ High Supervisory Attention	0.001***	0.085**	-0.070

Table 4–8: Sources of Adjustment (Pre. Vs. Post Dodd-Frank Act)

This table reports the difference in source of adjustment for the sample of treated and untreated banks in the Pre and Post Dodd-Frank Act period, under different corporate governance characteristics while the bank has a capital surplus or deficit. Columns (1) and (4) report pre-Dodd-Frank values of equity and retained earnings in panel A and securities and loans in panel B for the treated and non-treated banks respectively, while columns (2) and (5) report post Dodd-Frank values of equity and retained earnings in panel A and securities and loans in panel B for the treated and non-treated banks respectively. Columns (3) and (6) report the difference between Post and Pre Dodd-Frank values of equity adjustment in panel A and asset adjustment in panel B. I define treated banks as those with assets within the range between $10 Billion and $20 Billion. Where untreated banks are those within the asset range between $1 billion and $7 billion. I explore two major sources of adjustment; Banks can adjust their capital by shrinking/expanding their equity and/or retained earnings estimates for each category and the results are reported in panel A columns (1) - (6) respectively. **Δ Equity** is the annual change in equity divided by average assets. **Δ Retained Earnings** is the annual change in the retained earnings divided by average assets. Banks can close the gap by adjusting their securities (other earning assets) and/or loans - estimates are reported in panel B columns (1) - (6) respectively. **Δ Securities** is the other earning assets calculated as the annual change in total non-loan assets divided by average assets. **Δ Loans** is the annual change in net loans divided by average assets. **Deficit** is the absolute value of the gap between the target and actual capital ratio if the bank is below its target, otherwise it is equal to 0. **Surplus** is the absolute value of the gap between the target and actual capital ratio if the bank is above its target otherwise equal to 0. **Independent Directors** is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. All models are estimated using the System GMM specification with Windmeijer correction described in section 4.2.3.. Time dummies are included in the model. All Models includes set of control variables as of table 4-3. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel A: Equity Adjustment

		Δ Equity issuance			**Δ Retained Earning**		
		Pre	Post	Difference	Pre	Post	Difference
		(1)	(2)	(3)	(4)	(5)	(6)
Treated	Deficit * Board Independence	1.548*	3.598**	2.050**	8.123	-16.257	-8.133
		(0.744)	(1.122)		(8.097)	(9.562)	
Non-Treated	Deficit * Board Independence	0.569**	1.092*	0.523*	1.568***	8.753***	7.185***
		(0.266)	(0.547)		(0.270)	(2.812)	
Difference (Treated – Non-Treated)		**0.979****	**2.506*****		**6.555**	**-25.014**	
Treated	Surplus * Board Independence	-7.106***	-3.719**	3.387***	-1.152**	-0.746*	0.406**
		(2.658)	(1.020)		(0.496)	(0.373)	
Non-Treated	Surplus * Board Independence	-1.812***	-3.571***	-1.759***	-5.506***	-3.683***	1.823***
		(0.314)	(0.154)		(0.063)	(0.732)	
Difference (Treated – Non-Treated)		**-5.294*****	**-0.148*****		**4.354**	**2.937**	**-1.417**
Treated	Deficit * Financial Expertise	1.027***	1.650***	0.623***	0.641	0.001*	-0.64
		(0.377)	(0.586)		(0.209)	(0.000)	
Non-Treated	Deficit * Financial Expertise	3.051***	2.840***	-0.211***	-1.283***	2.930***	1.647***
		(0.603)	(0.267)		(0.418)	(0.687)	
Difference (Treated – Non-Treated)		**-2.024***	**-1.190*****		**1.924**	**-2.929**	
Treated	Surplus * Financial Expertise	-5.561**	-1.062*	4.499**	-2.339	-3.317	-0.978
		(2.511)	(0.531)		(2.561)	(4.793)	
Non-treated	Surplus * Financial Expertise	-1.691***	-3.159***	-1.468**	-3.903***	-7.814***	-3.911***
		(0.314)	(0.596)		(0.199)	(0.899)	
Difference (Treated – Non-Treated)		**-3.870*****	**2.097****		**1.564**	**4.497**	

Table 4–8: Sources of Adjustment (Pre. Vs. Post Dodd-Frank Act) *(Continued)*

This table reports the difference in source of adjustment for the sample of treated and untreated banks in the Pre and Post Dodd-Frank Act period, under different corporate governance characteristics while the bank has a capital surplus or deficit. Columns (1) and (4) report pre-Dodd-Frank values of equity and retained earnings in panel A and securities and loans in panel B for the treated and non-treated banks respectively, while columns (2) and (5) report post Dodd-Frank values of equity and retained earnings in panel A and securities and loans in panel B for the treated and non-treated banks respectively. Columns (3) and (6) report the difference between Post and Pre Dodd-Frank values of equity adjustment in panel A and asset adjustment in panel B. I define treated banks as those with assets within the range between $10 Billion and $20 Billion. Where untreated banks are those within the asset range between $1 billion and $7 billion. I explore two major sources of adjustment; Banks can adjust their capital by shrinking/expanding their equity and/or retained earnings estimates for each category and the results are reported in panel A columns (1) - (6) respectively. **Δ Equity** is the annual change in equity divided by average assets. **Δ Retained Earnings** is the annual change in the retained earnings divided by average assets. Banks can close the gap by adjusting their securities (other earning assets) and/or loans - estimates are reported in panel B columns (1) - (6) respectively. **Δ Securities** is the other earning assets calculated as the annual change in total non-loan assets divided by average assets. **Δ Loans** is the annual change in net loans divided by average assets. **Deficit** is the absolute value of the gap between the target and actual capital ratio if the bank is below its target, otherwise it is equal to 0. **Surplus** is the absolute value of the gap between the target and actual capital ratio if the bank is above its target otherwise equal to 0. **Independent Directors** is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. All models are estimated using the System GMM specification with Windmeijer correction described in section 4.2.3.. Time dummies are included in the model. All Models includes set of control variables as of table 4-3. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel B: Asset Adjustment

		Δ Securities			**Δ Loans**		
		Pre	Post	Difference	Pre	Post	Difference
		(1)	(2)	(3)	(4)	(5)	(6)
Treated	Deficit * Board Independence	-0.990	-0.386	0.604	-33.439	-8.900	24.539
		(5.320)	(1.921)		(44.147)	(10.531)	
Non-Treated	Deficit * Board Independence	-1.523*	-3.078***	-1.555**	-2.564***	-1.045	1.519
		(0.776)	(1.001)		(0.501)	(0.678)	
Difference (Treated – Non-Treated)		**0.533**	**2.692**		**-30.875**	**-7.855**	
Treated	Surplus * Board Independence	8.677***	5.473***	-3.204***	15.154	22.610	7.456
		(2.169)	(1.867)		(25.980)	(21.696)	
Non-Treated	Surplus * Board Independence	3.326***	5.318	1.992	1.006**	0.138	-0.868
		(0.850)	(3.288)		(0.429)	(0.797)	
Difference (Treated – Non-Treated)		**5.351**	**0.155**		**14.148**	**22.472**	**8.324**
Treated	Deficit * Financial Expertise	-1.696***	-0.196***	1.500***	-11.906	-2.128	9.778
		(0.207)	(0.009)		(9.400)	(2.216)	
Non-Treated	Deficit * Financial Expertise	-1.945***	-1.555***	0.390***	-0.010	-0.252***	-0.242
		(0.228)	(0.274)		(0.123)	(0.081)	
Difference (Treated – Non-Treated)		**0.249*** **	**1.354*** **		**-11.896**	**-1.876**	**9.536**
Treated	Surplus * Financial Expertise	16.175*	3.843	-12.332	8.180	9.842	1.662
		(8.309)	(2.060)		(8.460)	(8.117)	
Non-treated	Surplus * Financial Expertise	0.401**	0.412	0.011	0.443***	-0.154	-0.597
		(0.171)	(0.422)		(0.089)	(0.173)	
Difference (Treated – Non-Treated)		**15.774**	**3.431**	**-12.343**	**7.737**	**9.996**	**2.259**

Table 4–9: Source of Adjustment and Regulatory Scrutiny

This table reports the effect of regulatory scrutiny measures (supervisory attention) on selection of source of adjustment under different corporate governance characteristics while the bank has a capital surplus or deficit. I explore two major sources of adjustment; Banks can adjust their capital by shrinking/expanding their equity and/or retained earnings estimates for each category and the results are reported in columns (1) and (2) respectively. **Δ Equity** is the annual change in equity divided by average assets. **Δ Retained Earnings** is the annual change in the retained earnings divided by average assets. Bank can close the gap by adjusting their securities (other earning assets) and/or loans - estimates are reported in columns (3) and (4) respectively. **Δ Securities** is the other earning assets calculated as annual change in total non-loan assets divided by average assets. **Δ Loans** is the annual change in net loans divided by average assets. **Board Independence** is the ratio between the number of independent directors and board size. **Financial Expertise** is the ratio between numbers of independent financial expert directors and the total number of independent directors. **Deficit** is the absolute value of the gap between the target and actual capital ratio if the bank is below its target, otherwise it is equal to 0. **Surplus** is the absolute value of the gap between the target and actual capital ratio if the bank is above its target otherwise equal to 0. **Supervisory Attention** is dummy variable that takes the value of one in each year for the top 5 largest BHCs in each district. All models are estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. All Models includes set of time dummies and control variables as of Table 4-4. M_2 is the serial correlation tests of order 2 using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Equity Adjustment		**Asset Adjustment**	
	Δ Equity	Δ Retained Earnings	Δ Securities	Δ Loans
	(1)	(2)	(3)	(4)
Board Independence $_{t-1}$	-0.071*	-0.360*	0.077	0.134***
	(0.036)	(0.179)	(0.047)	(0.025)
Financial Expertise $_{t-1}$	0.065***	-0.117***	0.027**	-0.013*
	(0.022)	(0.026)	(0.011)	(0.007)
Deficit $_{t-1}$	1.917***	1.336***	-0.146	-0.049**
	(0.362)	(0.443)	(0.207)	(0.019)
Surplus $_{t-1}$	-2.453***	-1.279***	0.358*	-0.067
	(0.464)	(0.482)	(0.178)	(0.125)
Deficit * Board Independence	2.469	8.754***	-0.249	-0.431
	(2.375)	(1.748)	(0.772)	(0.457)
Surplus * Board Independence	-0.772***	-1.188	1.872***	0.368
	(0.006)	(1.244)	(0.471)	(0.281)
Deficit * Financial Expertise	3.175***	1.502	-1.189**	0.204
	(1.191)	(1.496)	(0.588)	(0.414)
Surplus * Financial Expertise	-0.180	-0.096	1.033	1.002***
	(1.256)	(1.272)	(0.634)	(0.300)
Supervisory Attention	0.581**	-0.773	0.363	-0.082
	(0.287)	(0.494)	(0.221)	(0.146)
Board Independence * Supervisory Attention	-0.578	1.010*	-0.162	-0.015
	(0.555)	(0.576)	(0.259)	(0.172)
Financial Expertise * Supervisory Attention	0.433**	-0.811***	0.395***	-0.090
	(0.209)	(0.249)	(0.114)	(0.070)
Deficit * Supervisory Attention	15.948***	35.748**	-7.998	-10.342**
	(3.188)	(14.991)	(7.355)	(4.732)
Surplus * Supervisory Attention	-12.685	-23.134	6.938	11.928**
	(16.027)	(15.065)	(7.503)	(4.619)
Deficit * Supervisory Attention * Board Independence	16.076**	-23.984	5.212	-10.580**
	(8.030)	(17.446)	(8.600)	(5.360)
Surplus * Supervisory Attention * Board Independence	8.382	24.475	15.049**	17.131
	(20.468)	(19.921)	(7.455)	(16.159)
Deficit* Supervisory Attention * Financial Expertise	13.060***	-0.913	6.180	3.963
	(5.529)	(7.983)	(4.087)	(2.425)
Surplus * Supervisory Attention * Financial Expertise	-49.750	-39.328***	9.836***	12.742
	(47.718)	(10.689)	(3.294)	(12.274)
Observations	4,929	4,929	4,929	4,929
Control variables	Yes	Yes	Yes	Yes

Table 4-9: Source of Adjustment and Regulatory Scrutiny (Continued)

This table reports the effect of regulatory scrutiny measures (supervisory attention) on selection of source of adjustment under different corporate governance characteristics while the bank has a capital surplus or deficit. I explore two major sources of adjustment; Banks can adjust their capital by shrinking/expanding their equity and/or retained earnings estimates for each category and the results are reported in columns (1) and (2) respectively. **Δ Equity** is the annual change in equity divided by average assets. **Δ Retained Earnings** is the annual change in the retained earnings divided by average assets. Bank can close the gap by adjusting their securities (other earning assets) and/or loans - estimates are reported in columns (3) and (4) respectively. **Δ Securities** is the other earning assets calculated as annual change in total non-loan assets divided by average assets. **Δ Loans** is the annual change in net loans divided by average assets. **Board Independence** is the ratio between the number of independent directors and board size. **Financial Expertise** is the ratio between numbers of independent financial expert directors and the total number of independent directors. **Deficit** is the absolute value of the gap between the target and actual capital ratio if the bank is below its target, otherwise it is equal to 0. **Surplus** is the absolute value of the gap between the target and actual capital ratio if the bank is above its target otherwise equal to 0. **Supervisory Attention** is dummy variable that takes the value of one in each year for the top 5 largest BHCs in each district. All models are estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. All Models includes set of time dummies and control variables as of Table 3-4. m_2 is the serial correlation tests of order 2 using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Equity Adjustment		**Asset Adjustment**	
	Δ Equity	Δ Retained Earnings	Δ Securities	Δ Loans
	(1)	(2)	(3)	(4)
Year Fixed effects	Yes	Yes	Yes	Yes
Number of Instruments	116	116	110	110
m_2 (p-value)	0.529	0.237	0.594	0.349
Hansen (P-Value)	0.510	0.259	0.185	0.530

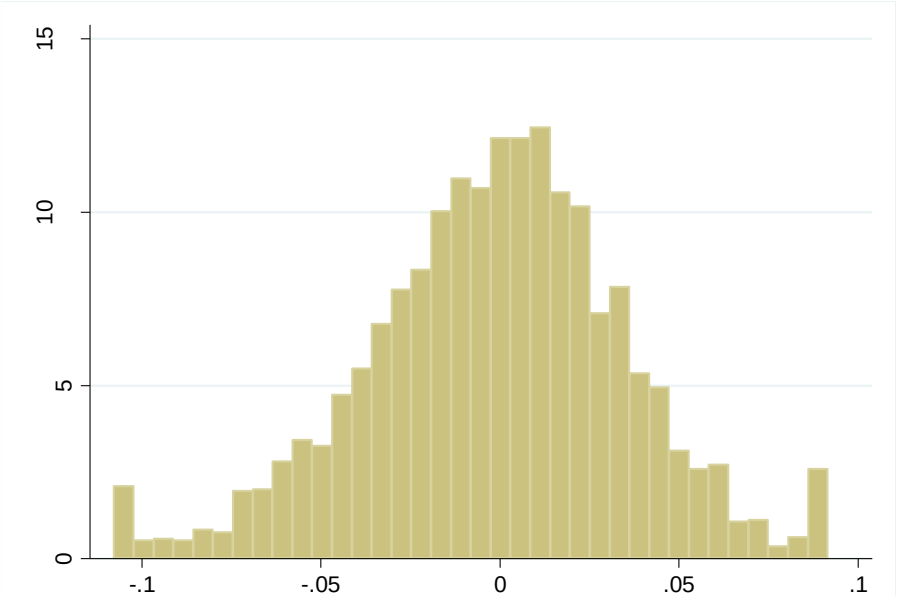

Figure 1

Figure 4-1: Sample Distribution of Deviation from Target Capital

This figure reports the sample distribution of the difference between the target capital ratio and the actual capital ratio.

Appendix

A Bank's Capital Management Under Different Board Structures and the Importance of Regulatory Scrutiny

This appendix contains results from the following additional tests

Table 4–10: 2SLS Estimation: Speed of Adjustment - Sub-Sample Analysis

This table reports the results for the impact of financial and non-financial independent directors on bank capital speed of adjustment using the 2SLS approach. The first stage results for below and (above) target capital banks are presented in column (1), (2), ((4), (5)) respectively. Model in column (3) and (6) report results for the below and above target capital banks from the second stage of the variable speed of adjustment model presented in section 4.3.2. The model is estimated using the 2SLS estimation technique $CR_{i,t} - CR_{i,t-1} = (\varrho Z_{i,t-1})\widehat{G_{i,t}} + \gamma Year_t + \delta_{i,t}$. **Board Independence to State** $_{t-1}$ is an instrumental variable calculated as the ratio between bank board independence and the average board independence of non-bank firms at the state level. **Board Independence** is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between numbers of independent financial expert directors and the total number of independent directors. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board, **Board Age** is the log of the average age of directors on the board, **Board Size** is the log transformation of the total number of directors on the board, **Tangibility** is the ratio between fixed to total assets, **Non-Performing Loans** is the ratio of non-performing loans to net loans, **Income Mix** is the ratio of non-interest income divided by non-interest income plus net interest income, **ROA** is the ratio between earnings before interest and tax to total assets, **Dividend to Assets** is the ratio of dividends to total assets, **Growth Opportunities** is the ratio between market to book value, **Size** is the log transformation of total assets measured in millions of US dollars, **Ratings** is the S&P credit ratings ranging from 1 to 9 (1= D and 9 = A+), **TARP Bank** is a dummy variable equal to 1 in the year a bank has received TARP funds. Effective Tax Rate is the ratio between total income tax paid to total income before tax, **GDP Growth** is the real GDP growth rate in (US Dollars), **Inflation** is the consumer price index, and **Crisis** is a dummy variable equal to 1 for the period 2007 – 2009. Time dummies and control variables are included in all models. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Below Target Capital Banks			Above Target Capital Banks		
	Stage 1		Stage 2	Stage 1		Stage 2
	Board Independence	Financial Expertise	Determinants of Speed of Adjustment (Below Target Capital Banks)	Board Independence	Financial Expertise	Determinants of Speed of Adjustment (Above Target Capital Banks)
	(1)	(2)	(3)	(4)	(5)	(6)
Board Independence to State $_{t-1}$	0.195***	0.177		0.106***	0.195	
	(0.026)	(0.172)		(0.029)	(0.185)	
Financial Expertise to State $_{t-1}$	-0.091	0.319**		0.084	0.138***	
	(0.056)	(0.152)		(0.144)	(0.049)	
Board Independence $_{t-1}$			-0.254***			0.264*
			(0.091)			(0.146)
Financial Expertise $_{t-1}$			0.054*			-0.084**
			(0.032)			(0.039)
CEO Duality $_{t-1}$	-1.127***	-0.209	-0.029	0.854***	1.096***	-0.034
	(0.152)	(0.414)	(0.023)	(0.123)	(0.358)	(0.036)
Board Age$_{t-1}$	-0.028**	-0.065*	-0.003	0.005	0.063**	0.004
	(0.014)	(0.037)	(0.002)	(0.010)	(0.030)	(0.003)
Board Size $_{t-1}$	0.994***	2.795***	-0.062	-0.779***	-2.218***	-0.015
	(0.271)	(0.736)	(0.043)	(0.215)	(0.627)	(0.065)
Tangibility $_{t-1}$	-4.057	34.626	-3.243**	1.218	6.999	1.356
	(8.243)	(22.360)	(1.355)	(6.212)	(18.083)	(1.803)
Non-Performing Loans $_{t-1}$	1.135	-8.899	-1.243***	1.161	-8.943	-2.650***
	(2.496)	(6.771)	(0.316)	(2.337)	(6.803)	(0.784)
Income Mix $_{t-1}$	2.284***	-1.621	0.053	-0.206	3.882**	-0.225
	(0.632)	(1.713)	(0.107)	(0.613)	(1.784)	(0.214)
ROA $_{t-1}$	-28.817***	-50.924**	-10.025***	20.903**	-9.463	1.854
	(7.551)	(20.483)	(0.956)	(8.637)	(25.140)	(3.030)
Dividend to Assets $_{t-1}$	49.524	-52.110	1.787	-96.733***	-186.822***	3.506
	(35.955)	(97.529)	(5.318)	(24.101)	(70.157)	(7.111)

Table 4-10: 2SLS Estimation: Speed of Adjustment - Sub-Sample Analysis (Continued)

This table reports the results for the impact of financial and non-financial independent directors on bank capital speed of adjustment using the 2SLS approach. The first stage results for below and (above) target capital banks are presented in column (1), (2), ((4), (5)) respectively. Model in column (3) and (6) report results for the below and above target capital banks from the second stage of the variable speed of adjustment model presented in section 4.3.2. The model is estimated using the 2SLS estimation technique $CR_{i,t} - CR_{i,t-1} = (\varrho Z_{i,t-1})\widehat{G_{i,t}} + \gamma Year_t + \delta_{i,t}$. **Board Independence to State** $_{t-1}$ is an instrumental variable calculated as the ratio between bank board independence and the average board independence of non-bank firms at the state level. **Board Independence** is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between numbers of independent financial expert directors and the total number of independent directors. **CEO Duality** is a dummy variable equal to 1 if the CEO is also the chairman of the board, **Board Age** is the log of the average age of directors on the board, **Board Size** is the log transformation of the total number of directors on the board, **Tangibility** is the ratio between fixed to total assets, **Non-Performing Loans** is the ratio of non-performing loans to net loans, **Income Mix** is the ratio of non-interest income divided by non-interest income plus net interest income, **ROA** is the ratio between earnings before interest and tax to total assets, **Dividend to Assets** is the ratio of dividends to total assets, **Growth Opportunities** is the ratio between market to book value, **Size** is the log transformation of total assets measured in millions of US dollars, **Ratings** is the S&P credit ratings ranging from 1 to 9 (1= D and 9 = A+), **TARP Bank** is a dummy variable equal to 1 in the year a bank has received TARP funds. Effective Tax Rate is the ratio between total income tax paid to total income before tax, **GDP Growth** is the real GDP growth rate in (US Dollars), **Inflation** is the consumer price index, and **Crisis** is a dummy variable equal to 1 for the period 2007 – 2009. Time dummies and control variables are included in all models. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Below Target Capital Banks			Above Target Capital Banks		
	Stage 1		Stage 2	Stage 1		Stage 2
	Board Independence	Financial Expertise	Determinants of Speed of Adjustment (Below Target Capital Banks)	Board Independence	Financial Expertise	Determinants of Speed of Adjustment (Above Target Capital Banks)
	(1)	(2)	(3)	(4)	(5)	(6)
Growth Opportunities $_{t-1}$	0.015**	0.006	0.005***	0.001	0.053	-0.033**
	(0.006)	(0.017)	(0.001)	(0.039)	(0.114)	(0.014)
Size $_{t-1}$	-0.139	-0.375	0.070***	0.121	-0.098	-0.043*
	(0.105)	(0.286)	(0.017)	(0.081)	(0.236)	(0.024)
Ratings $_{t-1}$	-0.141***	-0.339***	0.017*	0.010	0.116	0.017**
	(0.046)	(0.126)	(0.010)	(0.026)	(0.077)	(0.007)
Analysts $_{t-1}$	0.614***	0.660	-0.052**	-0.020	0.093	-0.007
	(0.151)	(0.409)	(0.021)	(0.106)	(0.307)	(0.034)
Institutional Block holders $_{t-1}$	0.443	-1.368	-0.182**	-0.243	-0.878	0.121
	(0.499)	(1.355)	(0.073)	(0.389)	(1.132)	(0.107)
TARP Bank	0.458**	0.475	0.036	0.055	-0.063	-0.835***
	(0.184)	(0.500)	(0.024)	(0.303)	(0.882)	(0.111)
Effective Tax Rate $_{t-1}$	-2.421**	-0.172	-0.276**	3.263***	4.651**	0.523*
	(0.993)	(2.694)	(0.130)	(0.813)	(2.366)	(0.300)
GDP Growth $_{t-1}$	0.012	0.441	0.007	-0.135	-0.238	-0.091**
	(0.138)	(0.374)	(0.015)	(0.087)	(0.252)	(0.046)
Inflation $_{t-1}$	-0.086	-0.311	-0.023*	-0.082	0.018	0.006
	(0.120)	(0.327)	(0.013)	(0.100)	(0.291)	(0.056)
Crisis	-0.065	0.812	-0.138**	-0.431	-1.431*	-0.216*
	(0.538)	(1.459)	(0.061)	(0.271)	(0.790)	(0.123)
Constant	0.586***	0.131	0.001	0.617***	0.181*	0.001
	(0.035)	(0.094)	(0.001)	(0.036)	(0.104)	(0.004)
Observations	2860	2860	2860	2069	2069	2069
R-squared	0.237	0.047	0.184	0.130	0.040	0.188
Cragg-Donald Wald F statistic (Test for Weak Instruments)	383.05***	391.20***		362.00***	379.47***	

Table 4–11: Director Expertise and Shock to Regulatory Scrutiny due to the Dodd-Frank Act Era

This table reports estimates on the impact of Dodd-Frank Act 2010 on board independence and independent directors' financial expertise on the capital ratio speed of adjustment. The first stage results are presented in column (1) of panel A. A partial adjustment model has been used to produce the estimates of the determinants of the Tier 1 capital ratio under a constant adjustment speed framework $CR_{i,t} = (\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \delta X_{i,t-1} + \theta MEco_{t-1} + \rho Year_t + \eta_i) + (1-\lambda) CR_{i,t-1} + \varepsilon_{i,t}$. Columns (2) and (3) of Panel A represent the estimates from the second stage analysis of the variable speed of adjustment model for below and above target capital banks respectively and is estimated using a pooled OLS regression $\Delta CR_{i,t} = \chi[(\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \xi Z_{i,t-1}) \widehat{DIFF}_{i,t-1}] + \psi Year_t + \Sigma_{i,t}$. **Post** is a Dummy variable that takes the value of one for the years 2011 – 2014. **Treat** is a dummy variable that takes the value of one when a bank has an asset value between $10 billion and $13 billion and remains zero for banks with assets between $5 million and $7 billion. **Board Independence** is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. Model in column (1) is estimated using the System GMM specification with Windmeijer correction described in section 4.2.3. Time dummies and control variables are included in all models. M_2 is the serial correlation tests of order *2* using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel A: Post Dodd-Frank Act Era (2011 – 2014)

	Determinants of Capital Ratio	Determinants of Speed of Adjustment (Below Target Capital Banks)	Determinants of Speed of Adjustment (Above Target Capital Banks)
Panel A: Regression Analysis	(1)	(2)	(3)
β_0Equity $_{t-1}$	0.647***		
	(0.001)		
β_1 Board Independence $_{t-1}$	-0.011***	-0.028**	0.091***
	(0.000)	(0.010)	(0.001)
β_2Financial Expertise $_{t-1}$	-0.004***	0.026	-0.022**
	(0.000)	(0.056)	(0.009)
β_3Post (P)	0.011	0.178*	-0.617
	(0.011)	(0.238)	(0.534)
β_4Treat (T)	0.011*	0.287	-3.293
	(0.005)	(0.381)	(2.156)
β_5Post*Treat (PT)	0.007**	4.817**	4.907**
	(0.002)	(1.950)	(2.254)
β_6 Board Independence *Post	0.018	0.106	-0.933
	(0.014)	(0.302)	(0.742)
β_7Financial Expertise*Post	0.007**	0.117	-0.076
	(0.004)	(0.086)	(0.249)
β_8 Board Independence *Treat	-0.001**	0.137	0.762
	(0.000)	(0.467)	(2.476)
β_9Financial Expertise*Treat	0.013***	0.114	0.096
	(0.001)	(0.402)	(0.920)
β_{10} Board Independence *PT	0.006***	0.380**	0.681**
	(0.002)	(0.128)	(0.257)
β_{11}Financial Expertise*PT	0.017***	0.495*	0.985**
	(0.003)	(0.196)	(0.455)
Observations	4,929	2,860	2,069
R-squared		0.227	0.380
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Number of instruments	106		
m_2 (p-value)	0.331		
Hansen (P-Value)	0.389		
Panel B: Marginal Effects			
Board Independence Directors			
Pre Dodd-Frank Act			
Non-treated			
β_1	-0.011***	-0.028**	0.091***
Treated			
$\beta_1 + \beta_8$	-0.003*	0.109***	0.853**
Post Dodd-Frank Act			
Non-Treated			
$\beta_1 + \beta_6$	0.007**	0.078***	-0.042*
Treated			
$\beta_1 + \beta_6 + \beta_8 + \beta_{10}$	0.012*	0.595***	0.601***

Table 4-11: Director Expertise and Shock to Regulatory Scrutiny due to the Dodd-Frank Act Era (Continued)

This table reports estimates on the impact of Dodd-Frank Act 2010 on board independence and independent directors' financial expertise on the capital ratio speed of adjustment. The first stage results are presented in column (1) of panel A. A partial adjustment model has been used to produce the estimates of the determinants of the Tier 1 capital ratio under a constant adjustment speed framework $CR_{i,t} = (\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \delta X_{i,t-1} + \theta MEco_{t-1} + \rho Year_t + \eta_i) + (1-\lambda) CR_{i,t-1} + \varepsilon_{i,t}$. Columns (2) and (3) of Panel A represent the estimates from the second stage analysis of the variable speed of adjustment model for below and above target capital banks respectively and is estimated using a pooled OLS regression $\Delta CR_{i,t} = \chi[(\beta_1 BI_{i,t-1} + \beta_2 FID_{i,t-1} + \beta_3 Post_{t-1} + \beta_4 Treat_{t-1} + \beta_5 Treat * Post + \beta_6 BI * Post_{i,t-1} + \beta_7 FID_{i,t-1} * Post_{t-1} + \beta_8 BI * Treat_{t-1} + \beta_9 FID * Treat_{t-1} + \beta_{10} BI * Treat * Post + \beta_{11} FID * Treat * Post + \vartheta BG_{i,t-1} + \xi Z_{i,t-1}) \widehat{DIFF}_{i,t-1}] + \psi Year_t + \Sigma_{i,t}$. **Post** is a Dummy variable that takes the value of one for the years 2011 – 2014. **Treat** is a dummy variable that takes the value of one when a bank has an asset value between $10 billion and $13 billion and remains zero for banks with assets between $5 million and $7 billion. **Board Independence** is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between the number of independent financial expert directors and the total number of independent directors. Time dummies and control variables are included in all models. M_2 is the serial correlation tests of order *2* using residuals in first differences. Hansen test is the test of the over-identifying restrictions. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

	Determinants of Capital Ratio	Determinants of Speed of Adjustment (Below Target Capital Banks)	Determinants of Speed of Adjustment (Above Target Capital Banks)
	(1)	(2)	(3)
Panel B: Marginal Effects			
Financial Expertise			
Pre Dodd-Frank Act			
Non-Treated			
β_2	-0.004***	0.026**	-0.022***
Treated			
$\beta_2 + \beta_9$	0.009***	0.140*	0.074***
Post Dodd-Frank Act			
Non-Treated			
$\beta_2 + \beta_7$	0.003***	0.143*	-0.098***
Treated			
$\beta_2 + \beta_7 + \beta_9 + \beta_{11}$	0.033*	0.752***	0.983***

Table 4–12: Sources of Adjustment (Pre. Vs. Post Dodd-Frank Act)

This table reports the difference in source of adjustment for the sample of treated and untreated banks in the Pre and Post Dodd-Frank Act period, under different corporate governance characteristics while the bank has a capital surplus or deficit. Columns (3) and (10) report the difference in the post and pre Dodd-Frank Act adjustment for the sample of treated banks, while columns (6), and (13) report the difference in the post and pre Dodd-Frank Act adjustment for the sample of untreated banks. Columns (7) and (14) report post- pre-Dodd Frank Act difference between treated and untreated banks. I define treated banks as those with assets range between $10 Billion and $20 Billion. Where, untreated banks are those with asset range between $1 billion and $7 billion. I explore two major sources of adjustment; Banks can adjust their capital by shrinking/expanding their equity and/or retained earnings estimates for each category and the results are reported in panel A columns (1) - (14) respectively. **Δ Equity** is the annual change in equity divided by average assets. **Δ Retained Earnings** is the annual change in the retained earnings divided by average assets. Banks can close the gap by adjusting their securities (other earning assets) and/or loans - estimates are reported in panel B columns (1) - (14) respectively. Δ Securities is the other earning assets calculated as the annual change in total non-loan assets divided by average assets. **Δ Loans** is the annual change in net loans divided by average assets. **Deficit** is the absolute value of the gap between the target and actual capital ratio if the bank is below its target, otherwise it is equal to 0. **Surplus** is the absolute value of the gap between the target and actual capital ratio if the bank is above its target otherwise equal to 0. Independent Directors is the ratio between the number of independent directors and board size, **Financial Expertise** is the ratio between numbers of independent financial expert directors and the total number of independent directors. All models are estimated using the System GMM specification with Windmeijer correction described in section 4.3.2. Time dummies are included in the model. All Models includes set of control variables as of table 3-4. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level and *Significant at the 10% level.

Panel A: Equity Adjustment

	Δ Equity							**Δ Retained Earnings**						
	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated vs. Non-Treated	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated VS Non-Treated
	Pre	Post	Post - Pre	Pre	Post	Post Vs. Pre		Pre	Post	Post - Pre	Pre	Post	Post - Pre	
	(1)	(2)	(3) (2)-(1)	(4)	(5)	(6) (5)-(4)	(7) (3)-(6)	(8)	(9)	(10) (9)-(8)	(11)	(12)	(13) (12)-(11)	(14) (10)-(13)
Board Independence $_{t-1}$	-3.713*	-0.389	-3.324	-0.045	0.208**	0.253	-3.577	-2.600	8.782	11.382	-0.348***	0.096	0.444	10.938
	(1.418)	(0.455)		(0.059)	(0.085)			(3.123)	(5.326)		(0.039)	(0.082)		
Financial Expertise $_{t-1}$	5.060	1.739	-3.321	-0.187***	0.129***	0.316	-3.367	0.433	3.827	3.394	-0.086***	-0.105***	-0.019***	3.413
	(3.432)	(1.587)		(0.012)	(0.012)			(1.021)	(2.350)		(0.007)	(0.019)		
Deficit $_{t-1}$	1.063	3.800	2.737	0.800	5.593***	4.793	-2.056	5.502	8.021	2.519	6.055***	5.121***	-0.934***	3.453
	(1.786)	(3.775)		(1.420)	(1.460)			(5.945)	(8.419)		(1.070)	(1.333)		
Surplus $_{t-1}$	-1.334	-0.409	0.925	-3.058**	-0.697	2.361	-1.436	-0.060	0.761*	-0.701	-5.237***	-6.388***	-1.151***	0.45
	(1.253)	(0.422)		(1.424)	(2.442)			(0.931)	(0.380)		(0.122)	(1.143)		
Deficit * Board Independence	1.548*	3.598**	2.050**	0.569	1.092***	0.523	1.527	8.123	-16.257	-8.133	1.568***	8.753***	7.185***	-15.318
	(0.744)	(1.122)		(1.866)	(1.747)			(8.097)	(9.562)		(0.270)	(2.812)		

Table 4-12: Sources of Adjustment (Pre. Vs. Post Dodd-Frank Act) (Continued)

Panel A: Equity Adjustment

	Δ Equity							**Δ Retained Earnings**						
	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated vs. Non-Treated	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated VS Non-Treated
	Pre	Post	Post - Pre	Pre	Post	Post Vs. Pre		Pre	Post	Post - Pre	Pre	Post	Post - Pre	
	(1)	(2)	(3) (2)-(1)	(4)	(5)	(6) (5)-(4)	(7) (3)-(6)	(8)	(9)	(10) (9)-(8)	(11)	(12)	(13) (12)-(11)	(14) (10)-(13)
Surplus * Board Independence	-7.106	-3.719	3.387	-1.812	-3.571	-1.759	5.146	-1.152	-0.746*	0.406	-5.506***	-3.683***	1.823***	-1.417
	(5.658)	(2.720)		(1.814)	(2.854)			(1.496)	(0.373)		(0.063)	(0.732)		
Deficit * Financial Expertise	1.027***	1.650***	0.623***	3.051***	2.840***	-0.211***	0.834	0.641	0.001*	-0.64	-1.283***	2.930***	1.647***	-2.287
	(0.377)	(0.586)		(0.603)	(0.267)			(0.209)	(0.000)		(0.418)	(0.687)		
Surplus*Financial Expertise	-5.561**	-1.062*	4.499***	-1.691***	-3.159***	-1.468**	5.967	-2.339	-3.317	-0.978	-3.903***	-7.814***	-3.911***	2.933
	(2.511)	(0.531)		(0.314)	(0.596)			(2.561)	(4.793)		(0.199)	(0.899)		
Observations	154	80		1,062	575			154	80		1,062	575		
Control Variables	Yes	Yes		Yes	Yes			Yes	Yes		Yes	Yes		
Year Fixed Effects	Yes	Yes		Yes	Yes			Yes	Yes		Yes	Yes		
Number of Instruments	101	88		101	88			101	88		101	88		
m_2 (p-value)	0.753	0.396		0.527	0.132			0.517	0.585		0.149	0.679		
Hansen P-value	0.110	0.269		0.390	0.156			0.355	0.601		0.182	0.486		

Table 4-12: Sources of Adjustment (Pre. Vs. Post Dodd-Frank Act) (Continued)

Panel B: Assets Adjustment

	Δ Securities							**Δ Loans**						
	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated vs. Non-Treated	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated vs. Non-Treated
	Pre	Post	Post - Pre	Pre	Post	Post - Pre		Pre	Post	Post - Pre			Post - Pre	
	(1)	(2)	(3) (2)-(1)	(4)	(5)	(6) (5)-(4)	(7) (3)-(6)	(8)	(9)	(10) (9)-(8)	(11)	(12)	(13) (12)-(11)	(14) (10)-(13)
Board Independence $_{t-1}$	-1.308	-1.299	0.009	-0.209***	0.258***	0.467	-0.458	-0.243	-1.112	-0.869	-0.095***	-0.064**	0.031	-0.9
	(1.578)	(5.255)		(0.019)	(0.044)			(1.314)	(3.664)		(0.010)	(0.025)		
Financial Expertise $_{t-1}$	-0.052	0.631	0.683	-0.064***	-0.006	0.058	0.625	-0.124	0.372	0.496	-0.009**	0.000	0.009	0.487
	(0.724)	(1.129)		(0.006)	(0.009)			(0.467)	(1.411)		(0.004)	(0.006)		
Deficit $_{t-1}$	-2.314	-4.045	-1.731	-2.269***	-9.383***	-7.114***	5.383	-25.911	0.822	25.089	2.252***	0.917	-1.335	26.424
	(2.061)	(7.414)		(0.626)	(1.118)			(32.383)	(1.752)		(0.376)	(0.576)		
Surplus $_{t-1}$	22.088	41.287	19.199	1.943***	5.492***	3.549***	15.65	15.102	15.523	0.421	0.862**	-0.216	-1.078	1.499
	(22.513)	(31.426)		(0.692)	(1.896)			(18.949)	(15.419)		(0.335)	(0.725)		
Deficit*Board Independence	-0.990	-0.386	0.604	-1.523*	-3.078***	-1.555**	2.159	-33.439	-8.900	24.539	-2.564***	-1.045	1.519	23.02
	(5.320)	(1.921)		(0.776)	(1.001)			(44.147)	(10.531)		(0.501)	(0.678)		
Surplus*Board Independence	8.677***	5.473***	-3.204***	3.326***	5.318	1.992	-5.196	15.154	22.610	7.456	1.006**	0.138	-0.868	8.324
	(2.169)	(1.867)		(0.850)	(3.288)			(25.980)	(21.696)		(0.429)	(0.797)		
Deficit * Financial Expertise	-1.696***	-0.196***	1.500***	-1.945***	-1.555***	0.390***	1.110	-11.906	-2.128	9.778	-0.010	-0.252***	-.242	9.536
	(0.207)	(0.009)		(0.228)	(0.274)			(9.400)	(2.216)		(0.123)	(0.081)		
Surplus * Financial Expertise	16.175*	3.843	-12.332	0.401**	0.412	0.011	-12.343	8.180	9.842	1.662	0.443***	-0.154	-0.597	2.259
	(8.309)	(29.060)		(0.171)	(0.422)			(8.460)	(8.117)		(0.089)	(0.173)		

Table 4-12: Sources of Adjustment (Pre. Vs. Post Dodd-Frank Act) (Continued)

Panel B: Asset Adjustment

	Δ Securities							Δ Loans						
	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated vs. Non-Treated	Treated	Treated	Treated	Non-Treated	Non-Treated	Non-Treated	Treated vs. Non-Treated
	Pre	Post	Post - Pre	Pre	Post	Post - Pre		Pre	Post	Post - Pre			Post - Pre	
	(1)	(2)	(3) (2)-(1)	(4)	(5)	(6) (5)-(4)	(7) (3)-(6)	(8)	(9)	(10) (9)-(8)	(11)	(12)	(13) (12)-(11)	(14) (10)-(13)
Observations	154	80		1,062	575			154	80		1,062	575		
Control Variables	Yes	Yes		Yes	Yes			Yes	Yes		Yes	Yes		
Year Fixed Effects	Yes	Yes		Yes	Yes			Yes	Yes		Yes	Yes		
Number of Instruments	101	88		101	88			101	88		101	88		
m_2 (p-value)	0.413	0.391		0.170	0.253			0.554	0.226		0.311	0.109		
Hansen (P-Value)	0.377	0.407		0.200	0.333			0.214	0.185		0.327	0.308		

5 Conclusions

5.1 Background to the Thesis

The global financial crisis caused the failure of financial institutions around the world. Consequently, scholars and policymakers turned their attention to the identification of the causes that contributed to triggering the crisis. Among several factors, scholars have attributed the weak governance arrangements of financial institutions as one of the major factors that contributed to weakening the financial institutions (Kirkpatrick, 2009). Since then the field of bank governance has gained significant importance in the community of corporate governance scholars and policymakers. Several policy reforms and alternative governance structures are proposed with the intention of improving governance mechanisms and to circumvent a crisis of a similar scale in the future.

Nevertheless, scholars and policymakers have a hard time reaching consensus as to which form of governance structure is likely to be more effective in enhancing the stability of individual financial institutions and the stability of the banking system as a whole. To design a governance policy for financial institutions is challenging for at least three main reasons. First, unlike non-bank firms, the core nature of the business of the banking makes them opaque and complex to monitor by the standard governance mechanisms. Second, the high leveraged nature of banks and the separation of financiers (depositors) and decision makers (managers, shareholders, and board of directors) complicate the standard agency theory framework by the additional conflict of interests between shareholders and depositors. Third, the integral role of banks in fund mobilization and economic development naturally gives them the cover of government guarantees and bailouts in a crisis situation which leads to excessive risk. This factor which is unique to banks, impairs

the efficiency of both monitoring and the advising aspect of standard corporate governance mechanisms.

The research conducted by policymakers and scholars regarding the corporate governance of banks after the global financial crisis has identified a wide number of potential measures specific to banks which could potentially address the shortcomings of the standard governance mechanisms. These measures range from the identification of optimal board size, independent risk committees, stringent governance policies for too-big-to-fail banks, directors with sufficient financial knowledge and experience regarding the complex trading activities, and an optimal number of independent directors on the board, with directors representing not only the interests of shareholders but depositors and wider stakeholders as well. Nevertheless, studies have not yet reached a consensus as to which of these governance measures actually help to achieve the goal of a stable banking system.

The thesis has analysed two main themes on banking governance with the purpose of contributing to the debate on the identification of directors' specific characteristics that help to improve overall bank performance. For the empirical analysis, the thesis focuses on US-listed banks for the period 2001 – 2014.

More precisely, chapter 3 examines the factors that drive the matching between bank boards and outside CEOs. More specifically, the chapter analyses the appointments of outside CEOs of financial and non-financial firms as independent directors on US banks boards and their impact on the short and long run performance and risk-taking of the banks and the outside CEO firms. The purpose of the analysis has been to test whether directors

with extensive human and social capital are more effective monitors and advisors for bank boards that leads to an improvement in bank performance and stability.

Chapter 4 employs the dynamic capital ratio speed of adjustment to examine the effect of corporate board structures on bank capital management. In specific, the analysis has been conducted to identify the differential effect of independent directors and financial expert independent directors on the target capital ratio, speed of adjustment towards the target capital (while controlling for the actual level of capital with respect to the target capital), and the source of adjustment banks use to achieve the target capital. Moreover, the chapter also studies the complementary effects of bank regulation on the impact of board structure on bank capital management. The purpose of the analysis is to identify the board structure which facilitates the regulators perspective regarding banks being equity capitalised.

5.2 Summary of the Findings

5.2.1 Outside CEOs of Financial and Non-Financial Firms as Independent Directors on Bank Boards

The analysis in chapter 3 has four key findings. First, the directors-board matching analysis shows that among other factors, the appointment of CEO directors on bank boards is largely driven by two major factors; first, the industry of the CEO firm and second, the bank business model, that is, lending oriented and non-conventional banks. More specifically, the analysis reveals that outside CEOs from financial firms are more likely to

join banks with a less traditional business focus, while CEOs from non-financial firms are appointed at lending-oriented banks.

The second key finding is regarding the shareholders' perception of who benefits, that is the appointing bank or the CEO firm, from the appointment of two types of outside CEOs. The finding from this analysis reveals that the bank shareholders only perceive the appointment of financial firm CEOs as a positive signal for banks' future performance. In contrast, the appointment of non-financial firm CEOs are perceived as being less valuable as compared to directors who are non-CEOs but are currently employed in the financial industry. The analysis regarding the market reaction of a CEO firm's shareholders, however, reveals a different story. Higher abnormal returns are recorded around the appointment of a non-financial firm CEO to a lending-oriented bank as compared to the appointment of a financial firm CEO. These findings are consistent with the view that the shareholders of the outside CEO firm expect benefits in terms of credit access from the bank board membership.

The third key finding from the chapter comes from the analysis on the advising and monitoring quality of two types of CEO directors (financial and non-financial firm CEOs). The findings for the advising quality analysis show that the appointment of financial firm CEO directors increases the non-interest income, reduces lending and these changes benefits the appointing bank in terms of increased profitability and a decrease in risk exposure measured as tail risk. In contrast the appointment of non-financial firm CEOs increases bank lending which consequently increases bank risk with no significant change in profitability. The analysis regarding the advising quality of the CEO directors shows a

significant and positive impact of financial firm CEO directors on the performance-turnover and pay-performance sensitivity of the appointing bank CEO. However, no significant impact has been recorded on the advising quality of bank board with non-financial firm CEO directors.

Finally, the fourth key finding of the chapter is regarding the impact of CEO appointments to bank boards on the long run performance of the CEO firms. In particular, the chapter analyses three components of the long-run performance of CEO firms, i. bank debt, ii. profitability, and iii. tail risk. The analysis reveals that non-financial firms retrieve most benefits from the bank board membership of their CEOs. An increase in bank debt, profitability and risk exposure is recorded in the post-appointment era of non-financial firm CEOs. In contrast, the appointment of financial firm CEOs has a significant and positive impact on the profitability of the firm.

In summary, two key conclusions emerge from this chapter. First, the appointment of a financial firm CEO on the bank board is motivated by the monitoring and advising quality of these directors. Second, the appointment of a non-financial firm CEO does not seem to provide particular benefits to the appointing bank, rather the firm of the CEO obtains benefits from the bank board membership.

5.2.2 A Bank's Capital Structure Management and the Role of Board Structures

The results from this chapter highlight the nexus between corporate board structures and capital management in banks. In particular, the chapter findings are specific to the impact of board independence and the proportion of financial expert independent

directors on three aspects of capital management; the target capital ratio, the speed of adjustment towards target capital, and the source of adjustment the bank used to achieve the target capital ratio. Moreover, the chapter also presents findings on the complementary role of bank regulation and its influence on the relationship between board structure and bank capital management.

This chapter has four key findings. First, the analysis of the relationship between corporate board structure and the target capital ratio reveals that highly independent boards and a greater proportion of financial expert independent directors are negatively related to the bank target capital ratio. This finding is consistent with agency theory and the bank governance literature which suggests highly independent boards and the presence of financial expert directors on a bank board encourages risk shifting onto debtholders and taxpayers.

The second key finding of this chapter comes from the analysis on the relationship between board structure (board independence and financial expert independent directors) and the speed at which banks close the gap between the actual and target capital ratio. More specifically, the findings show that independent directors favour shareholders' interest by prolonging the condition of the capital deficit and making a quick downward adjustment in conditions of capital surplus. In contrast, financial expert independent directors exhibit an alternate strategy. The presence of such directors on a board minimises the time banks remain undercapitalised and prolong the conditions of capital surplus. By studying the capital adjustment speed for undercapitalised and overcapitalised banks this analysis also

aids the identification and capital adjustment process of undercapitalised banks which are the main concern of the regulators.

Third, the chapter documents a complementarity between internal governance mechanisms and bank regulation in influencing bank capital structure management. In general, the findings show that bank regulations complement internal governance structures. More specifically, it is observed that the choice of independent directors and in particular the choice of financial expert independent directors regarding target capital level becomes more aligned with broader shareholder interests when banks face regulatory scrutiny. The important finding is that regulatory scrutiny leads to financial expert independent directors to speed up the adjustment process in an undercapitalised bank to avoid prolonged conditions of capital deficit.

The fourth key finding of the chapter is in regards to the impact of board independence and financial expert independent directors on the source of adjustment (which is adjusting the numerator and/or denominator of the capital ratio) banks opt for to achieve the target capital ratio. The findings from this analysis show that banks with highly independent boards adjust capital surplus conditions through equity repurchase and by increasing lending activity. However, such directors avoid equity issuance to make an upward capital adjustment but prefer to shrink security holdings to correct the capital deficit conditions. In contrast, banks with a higher proportion of financial expert independent directors on the board do not use equity repurchase as an adjustment source but instead such banks make a downward adjustment in their capital ratio by reducing retained earnings and increasing lending activity. However, during periods of capital deficit, financial expert

directors increase the capital ratio by simultaneously adjusting the numerator and denominator – that is, issuing equity, increasing retained earnings and shrinking security holdings. In general, I find that the addition of financial experts onto bank boards might be beneficial in reducing the risk of an asset fire-sale in the presence of undercapitalization.

Overall, two main conclusions emerge from the findings of this chapter. First, board independence and financial expert independent directors play an integral role in determining the bank capital management process. Second, the complementary effect of bank regulation has a significant influence on the relationship between board structure and capital management. In sum, the findings from this chapter complement the recent regulatory changes (Dodd-Frank Act, 2010), as it appears that adding financial expert directors to bank boards is more effective in terms of safeguarding broader bank stakeholders' interest.

5.3 Policy implications

In summary, the research presented in the thesis contributes to the literature on banks' corporate governance by analysing the implications of corporate board structure and directors' specific human and social capital on bank performance (and risk exposure) and the capital adjustment process. More specifically from the policy perspective, the research presented in this thesis demonstrate that a combination of directors' managerial skills and industry-relevant experience has a positive impact on monitoring and the advising quality of banks' corporate boards.

These findings fits in the current policy debate on corporate governance in banks which suggest that a tailored corporate governance framework is required for banks that

can efficiently balance the interests of the shareholders and external stakeholders by carefully monitoring the risk taking and performance of the banks (Anginer et al., 2016; 2018; Basel Committe on Banking Supervision, 2015; DeAngelo and Stulz, 2015). Moreover, the findings presented in this thesis also contributes to the ongoing regulatory debate on improving the overall monitoring and advising quality of bank boards (Basel Committee on Banking Supervision, 2010, 2015; OCC, 2016). In particular, the findings suggest that policy makers/regulators should design corporate governance framework that is tailored according to bank specificities and require banks to appoint independent directors with appropriate skill set relevant to banking industry.

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