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Corporate Governance and Bank Risk-taking

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ABSTRACT

Manuscript Type: Review

Research Question/Issue: Bank governance has become the focus of a flurry of recent research and heated policy debates. However, the literature presents seemingly conflicting evidence on the implications of governance for bank risk-taking. The purpose of this paper is to review prior work and propose directions for future research on the role of governance on bank stability.

Research Findings/Insights: We highlight a number of key governance devices and how these shape bank risk-taking: the effectiveness of bank boards, the structure of CEO compensation, and the risk management systems and practices employed by banks.

Theoretical/Academic Implications: Prior work primarily views bank governance as a mechanism to protect the interests of bank shareholders only. However, given that taxpayer-funded guarantees protect a substantial share of banks' liabilities and that banks are highly-leveraged, shareholder-focused governance may well subordinate the interests of other stakeholders and exacerbate risk-taking concerns in the banking industry. Our review highlights the need for internal governance mechanisms to mitigate such behavior by reflecting the needs of shareholders, creditors and the taxpayer.

Practitioner/Policy Implications: Our review argues that the relationship between governance and risk is central from a financial stability perspective. Future research on issues highlighted in the review offer a footing for reforming bank governance to constrain potentially undesirable risk-taking by banks.

Keywords: Corporate Governance, Banks, Board of Directors, CEO pay, Risk Management

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INTRODUCTION

There has been considerable academic and regulatory interest in how to mitigate bank risk-taking behavior in recent years. Undue risk-taking by banks jeopardizes the safety and soundness of individual institutions as well as the stability of the entire financial sector when contagion causes risks to spill over to other financial institutions.

A case in point is the financial crisis that started in 2008. It is by now a widely-held view that the vulnerability of the banking sector during the crisis was at least in part caused by a build-up of excessive risk by some banks before the crisis (Brunnermeier, 2009; DeYoung, Peng, & Yan, 2013). Further, there is significant discussion over the extent to which governance failures have contributed to the risk exposures of banks. In particular, there are questions over whether bank boards were unable to effectively monitor and control bank risk, whether executive pay was excessively structured to promote risk-taking, and whether banks' risk management systems were adequate (Bebchuk & Spamann, 2009; Kashyap, Rajan, & Stein, 2008; Kirkpatrick, 2009)¹. The purpose of this paper is to focus on these issues by reviewing existing research on bank governance and risk with a view to formulate empirical questions for future research.

Our review is set against the background of recent regulatory reforms that have placed great emphasis on reforming governance in order to control bank risk-taking (Basel Committee, 2014; Federal Reserve, 2010; Liikanen Report, 2012). To date, policymakers and regulators have focused on specific governance shortcomings. In the UK, the Walker review (2009) focused on making recommendations on board arrangements and the qualifications of board members as well as on the compensation arrangements of UK banks and financial firms. Similarly, the Netherlands has had a Banking Code in place since 2010 that contains guidelines on the make-up of bank boards, including the qualification and training of board members and their remuneration. Additionally, compensation guidelines for CEOs and other

senior executives at large banks have raised the need for pay instruments to align managerial interests with ensuring bank stability (Federal Reserve, 2010).

However, Kashyap et al. (2008) argue that existing reforms tend to address only specific governance shortcomings, such as those related to pay or board composition, but do not address more fundamental governance flaws. Equally, Becht, Bolton, & Roell (2011) note that ongoing reforms tend to follow pre-crisis traditions whereby governance mechanisms put shareholders firmly in control. This has resulted in considerable academic interest in identifying alternative approaches to reforming bank governance. For instance, the IMF (2014) conducted a review of the extant literature on bank governance and assessed the impact of various governance measures on bank risk and performance. Specifically, the report argues that extant research has largely looked at the impact of governance on bank risk by looking at a select few governance mechanisms in isolation.

Further, Stulz (2015) argues that governance plays an important role in helping banks pursue an 'optimal' level of risk that allows managers to maximize shareholder value while also taking into account the social costs of bank failures. To achieve this objective, Stulz discusses the role of an effective risk management framework in identifying, measuring, and controlling bank risk exposures. Similarly, de Haan and Vlahu (2015) also review the corporate governance literature in banks, but their focus is primarily on the link between governance and bank performance (rather than governance and risk).

Our study builds upon the IMF (2014) study and other existing work by taking a slightly different approach. We focus on reviewing the extant literature to identify 'blind spots' or policy-relevant research topics that have received limited research attention to date. In particular, this review differs from prior work in that we argue that bank governance should not be limited to appeasing shareholder interests, but also account for the interests of creditors and taxpayers—two stakeholder groups that play an important role in the banking

industry. To this end, we examine the current state of research on internal bank governance by focusing on three broad themes and their impact on bank risk: the effectiveness of bank boards, the risk management systems and practices employed by banks, and the structure of CEO compensation (see Table 1 for a brief summary of prior research on different elements of bank governance and risk-taking). Ultimately, the purpose of this paper is to formulate questions for future empirical research.

Bank boards are the apex of the internal governance system. Boards hold overall responsibility for providing oversight into the monitoring of bank management, setting executive compensation contracts, and implementing an effective system of risk governance. To this end, our review first looks into the role of the board in terms of monitoring and advising senior bank executives. Next, our review looks into the role of executive compensation. Prior empirical literature has argued that bank boards structured executive pay to reward executives for excessive risk-taking through the use of stock options and short-term pay (DeYoung et al., 2010; Federal Reserve, 2010). Our review presents valuable insights on alternate pay mechanisms that can motivate bank managers to take into account the interests of other stakeholders. Finally, a board's ability to offer effective risk oversight is also conditional on accurate risk assessment and timely communication by the risk committee. To this end, our review highlights various research avenues that can further our understanding on the impact of risk management practices (e.g. presence of risk committee and Chief Risk Officer, and risk culture) on risk-taking.

Research on topical issues highlighted in this review may help inform policy research in developing sound and balanced governance structures. This can help in developing a more textured understanding of how each governance dimension operates. For instance, the review highlights how director skills and expertise affect risk monitoring and how the use of debt-based pay instruments for senior executives results in less risky bank policies.

This review article is organized as follows. The next section presents the theoretical foundations of governance and risk for banks. We then review past and ongoing research on the role of the monitoring role of board of directors, the impact of CEO compensation instruments on risk-taking and the role of risk governance in banks. The final section concludes.

BACKGROUND

We start this section by surveying existing measures of bank risk-taking that have been adopted by prior research. We then outline the theoretical foundations for why the risk-taking behavior by banks is of particular significance and how banks differ from non-banking institutions in important ways. In particular, we argue that banks' core activities are information-based and highly opaque, their capital structure is geared toward debt much more than any other major industry, and that the government is an important stakeholder in banks as an underwriter of guarantees. Finally, we highlight how 'traditional' governance frameworks (i.e. those that align manager and shareholder interests) may result heightened risk-taking concerns in the banking industry.

Bank Risk-taking

For the purposes of this review, we define bank risk-taking as policies that increase risk through any of various channels. We discuss some of the commonly used proxies for bank risk below.

Market risk captures losses incurred due to the impact of adverse market movements on the value of banks' on- and off-balance sheet positions. Recent regulatory reforms have focused on the framework used by banks to assess market risk since losses incurred on banks' trading books during the recent crisis had depleted bank capital and heightened financial stability concerns (Basel Committee, 2012). Prior work has measured market risk through tail

risk measures, such as Value-at-Risk (VaR) and Expected Shortfall to estimate expected losses in the case of tail events (Bekkum, 2015; Ellul & Yeramilli, 2013). Another common measure is stock volatility (Anderson & Fraser, 2000; Chen, Steiner, & Whyte, 2006; Konishi & Yasuda, 2004).

Further, default risk is a composite measure of bank risk that combines risks arising from investment and financing activities. Prior work has focused on measuring default risk through either an accounting-based measure Z-score (Houston, Lin, Lin, & Ma, 2010; Laeven & Levine, 2009; Pathan, 2009) or a market-based measure based on Merton's structural distance-to-default model (Gropp, Vesala & Vulpes, 2006; Hagendorff & Vallasca, 2011).

Relatedly, banks can also pursue policies that result in shifting the costs of default to the taxpayer. To measure risk shifting, studies have sought to estimate the value of the government's financial safety net to shareholders as the value of a put option underwritten by taxpayers (Hovakimian & Kane, 2000; Merton, 1977; Ronn & Verma, 1986).

Leverage risk is defined as the risk arising from banks holding low amounts of capital to support their operations. Leverage risk is commonly measured using book capital ratios, such as high-quality (Tier-1) capital or risk-adjusted capital ratios (Flannery & Rangan, 2008; Gropp & Heider, 2010; Nier & Baumann, 2006). Finally, portfolio risk is defined as the volatility of asset returns arising from a bank's investment activities. Prior work has measured the portfolio risk of banks using the ratio of risk-weighted assets to assets or either book-based or market-based measures of asset volatility (Flannery & Rangan, 2008; Shrieves & Dahl, 1992; Vallasca & Hagendorff, 2013).

Theory: Are Banks Different?

Banking theory outlines various characteristics that differentiate banks from non-financial firms (Bhattacharya & Thakor, 1993; Diamond & Dybvig, 1983; Merton, 1977). This section focuses on the implications of these characteristics on bank risk-taking.

At its core, banking involves institutions accepting short-term liquid deposits and transforming them into long-term illiquid loans. During this intermediation process, banks privately monitor and collect information about the quality of their loan portfolio. Since bank loans are informationally opaque, external stakeholders cannot possess all relevant information to assess the true value of bank assets (Diamond, 1989, 1991; Morgan, 2002). As a result, managers may pursue policies that increase bank risk, without reflecting this being reflected on backward looking balance sheets (Becht et al., 2011; Mehran, Morrison, & Shapiro, 2011).

Further, banks are unique because they benefit from explicit deposit insurance guarantees and more implicit guarantees in the form of emergency liquidity and the possibility of capital assistance (i.e. bailouts) in times of distress (Bhattacharya & Thakor, 1993). Government guarantees act as a put option on a bank's assets and the value of this put is increasing in bank risk (Kareken & Wallace, 1978; Merton, 1977). Banks seek to maximize the value of the put by pursuing policies that increase overall risk. Consistent with this view, the extant literature has provided evidence of increased risk-taking in the presence of government guarantees (Dam & Koetter, 2012; Hovakimian & Kane, 2000).

Finally, banks are highly levered financial institutions where leverage exists as a factor of production². Leverage results in exacerbating risk-taking concerns because the option value of government guarantees to shareholders is increasing with firm leverage, which leads to magnified benefits of increasing bank risk for highly levered banks (Bebchuk & Spamann, 2009; John, Mehran, & Qian, 2010; Keeley & Furlong, 1990).

Shareholder-oriented v Stakeholder-oriented Bank Governance

Governance mechanisms deal with the ways in which outside investors and other stakeholders, such as government and employees, exercise control over senior management and other corporate insiders in order to protect their interests. Prior work has interpreted this from an agency-theoretic framework where utility-maximizing managers are risk-averse and lack the incentives to pursue risky but positive NPV projects (Jensen & Meckling, 1976). To mitigate the agency costs of equity, key governance structures focus on protecting and promoting shareholder interests. Examples of this are the presence of independent directors on bank boards, the widespread use of equity instruments in executive remuneration, and a general assessment of executive performance on the basis of meeting shareholder interests (Holmstrom, 1982; Jensen & Meckling, 1976; Smith & Stulz, 1985; Weisbach, 1988).

However, there are conflicts between the risk preferences of shareholders and bank creditors. Shareholders hold convex claims over firm assets which cause their expected payoffs to rise exponentially with bank risk (Jensen & Meckling, 1976). By contrast, creditor payoffs are concave due to limited upside potential on the value of their claims. For creditors, excessive risk-taking, therefore, implies a higher probability of losses without the same potential for gains that shareholders benefit from. Such conflicts between bank shareholders and creditors are further exacerbated by bank bailout guarantees. There is a real prospect that highly leveraged banks take on undue risks in ways that benefits bank shareholders at the expense of creditors and the taxpayer (Bhattacharya & Thakor, 1993; John, Saunders, & Senbet, 1991).

This risk-shifting problem in banking (when banks force taxpayers to finance their risk exposures) is widely recognized. For instance, John, Saunders & Senbet (2000) show that aligning the interests between managers and shareholders results in banks taking risks that

benefit bank shareholders at the expense of creditors and the taxpayer. Bolton, Mehran, & Shapiro (2015) also develop a theoretical model to show that shareholders lack appropriate incentives to control risk-taking by banks in order to take advantage of government guarantees and inability of external stakeholders to accurately measure bank risk.

In response to this issue, various scholars have proposed the need for bank governance to represent the interests of shareholders, creditors and taxpayers (Adams & Mehran, 2003; Berger, Kick, & Schaeck, 2014; Bolton et al., 2015; Macey and O'Hara, 2003). Prior research provides some supporting evidence on the role of creditors and depositors in disciplining bank risk-taking. This stream shows that risky banks are charged higher interest rates in the interbank borrowing market (Furfine, 2001; King, 2008) and the subordinated debt market (Flannery & Sorescu, 1996). Depositors can also discipline risk-taking by demanding higher interest rates (Berger & Turk-Ariss, 2014; Martinez Peria & Schmukler, 2001). However, this research has focused on the role of creditors in externally monitoring bank risk-taking. Aligning manager and creditor interests through internal governance mechanisms (e.g. through executive pay that reflects creditor wealth) is likely to be a more effective and the foundation of a governance mechanism that balances the interests of shareholders and creditors.

The next section focuses on the role of bank boards in controlling bank risk-taking and meeting creditor interests. We highlight a range of board characteristics that moderate a board's ability to monitor executives and can, therefore, help to protect creditor interests and maintain bank stability more generally.

THE ROLE OF THE BOARD IN MONITORING AND CONTROLLING RISK

The board of directors is widely regarded as the cornerstone of an effective internal governance framework (Fama & Jensen, 1983). It has ultimate responsibility for risk

management and setting the tone for a bank's risk-taking culture at the top. The board ensures bank stability by monitoring executives over the impact of firm policies on bank risk, evaluating if current and future risk-exposure is consistent with risk appetite, and designing executive incentives to promote prudent risk-taking.

Despite the key role that boards play in ensuring an effective system of governance, academic research on the impact of board characteristics on bank risk-taking is strikingly sparse. Most of the research in this area has been derived from non-financial firms (e.g. Adams & Ferreira (2008); Almazan & Suarez (2003); Harris & Raviv (2008); Hermalin & Weisbach (1998); Raheja (2005)).

Overall, the extant empirical research on the impact of boards on bank risk-taking presents ambiguous evidence. Akhigbe & Martin (2008) study the impact of the Sarbanes-Oxley (SOX) Act on financial institutions. The authors show that firms with independent boards see a decline in their stock volatility over the long-term. Erkens, Hung, & Matos (2012) do not find any impact of board independence on bank risk during the financial crisis for a sample of large international banks. By contrast, Pathan (2009) reports that stronger boards, that is, boards which are smaller and exhibit stronger shareholder rights, are positively related to bank risk-taking. However, the author reports that boards characterized by a higher fraction of independent directors pursue less risky policies. Beltratti & Stulz (2012) also present evidence to show that banks with a shareholder-friendly board were more risky, although the results do not hold when the authors use different measures of risk.

Previous research suffers from the issue that the advisory and monitoring roles of the board are not directly observable. This has caused researchers to look at the impact of boards on observable outcomes such as bank policies or performance instead (Adams, Hermalin, & Weisbach, 2010). Moreover, board independence is a broad measure that fails to account for

more nuanced board dynamics. The following two sub-sections examine more fine-grained aspects of board functions by highlighting the role of various board attributes in effective monitoring of senior management and the impact of powerful CEOs in undermining board effectiveness.

Board Attributes

We employ a broad definition of board attributes to encompass various competencies and skills that board members possess and the role that these attributes play in influencing bank policies. For instance, a diverse board may well be able to represent the interests of various stakeholders and, more importantly, solve complex issues faced by a firm in its day-to-day operations (Forbes & Milliken, 1999). Similarly, board competence in terms of prior banking experience and financial expertise may allow board members to better assess the impact of bank policies on risk (Kirkpatrick, 2009; Walker, 2009).

While recent research has started to examine the effects of different board attributes, a majority of this stream has focused on assessing its impact on bank performance (e.g. Erkens et al. (2012); Hagendorff & Keasey (2012); Nguyen, Hagendorff, & Eshragi (2013)). Berger et al. (2014) are among the first to look at board demographics and bank risk-taking. They find that executive teams composed of younger members and more women increase bank risk, while boards with a higher representation of individuals with a doctorate degree are negatively related to bank risk.

Ongoing policy debates have proposed the need for stakeholder representation on bank boards (Basel Committee, 2014; Kirkpatrick, 2009; Walker, 2009). For instance, the IMF (2014) recommends that some board members should be creditor representatives. This is consistent with extant theoretical and empirical evidence that unsecured creditors (e.g., investors in convertible debt (Hilscher & Raviv, 2014), holders of uninsured depositors

(Bennett, Hwa, & Kwast, 2014) or interbank borrowers (Furfine, 2001; King, 2008)) are effective in terms of controlling risk-taking. In this context, Hilscher & Sisi-Ciamarra (2013) show that the presence of creditor representatives on boards is associated with creditor-friendly policies. The authors show that mergers announced by non-financials with a higher fraction of creditor-directors are associated with an increase in bondholder wealth and a fall in shareholder wealth.

Board competence in terms of the educational qualifications and prior relevant experience can also have an important bearing on bank risk-taking incentives. Given that banks are highly opaque and complex organizations, better education may influence the ability of directors to understand and interpret sophisticated risk measurement techniques and the impact of bank policies on risk. Consistent with this, Berger et al. (2014) show that banks where a higher fraction of executive officers held doctorate degrees were associated with lower risk.

Harris & Raviv (2008) posit that financial expertise is essential to understand the complex workings of the firm and the risks associated with firm policies. Various researchers (Hau & Thum, 2015; Minton, Taillard, & Williamson, 2014) and policy reviews (Kirkpatrick, 2009; Walker, 2009) have argued that many bank boards lacked sufficient financial expertise to identify and control bank risk-exposures in the years preceding the crisis. Hau & Thum (2015) show that German banks where supervisory boards lacked financial expertise suffered from larger losses during the recent financial crisis. By contrast, Minton et al. (2014) report a positive relationship between financial expertise and bank risk in their sample of US banks. The authors attribute this to the fact that financial expertise allows board members to evaluate risky policies that may favor shareholders.

Future research should evaluate the marginal impact of financial expertise on the likelihood that banks engage in regulatory arbitrage and underestimate their risk-exposures. An interesting avenue on which to base this research could be countries which employ a dual-tier structure (e.g. Germany, Japan, etc.) where supervisory boards consist of creditors and employees, thereby representing stakeholder interests. While Berger et al. (2014) also study the implications of board characteristics, such as, age, gender, and educational background, on risk-taking, the focus of their research is on executive board members. Future research should investigate if non-executive directors in the supervisory boards have the power and influence to shape bank policies. This issue is particularly important given the heightened expectations that US bank regulators have of bank boards in terms of providing effective risk oversight.

Board Process

Another important dimension that may affect bank risk-taking is board process. Board process refers to the behavior and the involvement of directors in a bank's decision-making process, such as director attendance, conduct during board meetings, and the relationship between executive directors and non-executive directors (Forbes and Milliken, 1999; McNulty, Florackis, and Ormrod, 2013; Roberts, McNulty, Stiles, 2005;). These and similar aspects of director behavior are also laid out in regulatory expectations of bank boards. For instance, the Office of the Comptroller of the Currency (1999) in the U.S. lays down key director responsibilities which include staying informed about bank policies through regular attendance in meetings, preparing for meetings, and active involvement during board meetings.

Forbes and Milliken (1999) develop a theoretical framework that explains the internal workings of the board. The authors identify key processes that help explain how boards

function. Pettgrew and McNulty (1995) categorize board involvement in firm-related matters into minimalist and maximalist boards. Firms where boards of directors are actively involved in shaping and influencing the choice of firm policies are classified as maximalist boards and board which yield little influence are classified as minimalist.

McNulty et al. (2013) show that board process is a key determinant of financial risk for non-financial firms. However, the authors note that board process does not influence business risk and partly attribute this finding to passive board behavior. In the context of banks, Adams and Ferreira (2012) argue that attendance is a key responsibility for directors since it helps in obtaining firm-specific information. However, the authors show that bank boards have poor attendance records compared to non-financials and that regulatory pressure is not sufficient to boost attendance, although meeting fees and total compensation have an economically significant influence.

However, there is little research on the implications of board process on risk-taking in banks. Internal board dynamics in terms of greater involvement of the board in key bank decisions can be one of the ways to improve bank governance. For instance, future research should assess how boards function when making important decisions. Another interesting issue may be to explore the importance that each bank assigns to developing director knowledge and skills through internal training programs and to explore if such practices can improve the monitoring of executives.

CEO Power

Another important element that moderates the effectiveness of boards of directors is CEO power (Adams, Almeida, & Ferreira, 2005; Hermalin & Weisbach, 1998). In empirical studies, the power of a CEO is often captured using the number of positions held by a CEO

(in particular, whether or not the CEO also acts as chairman), a CEO's tenure, or her performance relative to peers (Adams et al., 2005; Hermalin & Weisbach, 1998).

Powerful CEOs are likely to undermine board independence if they are able to influence board decisions and prevent boards from effective monitoring. Adams et al. (2005) show that firms with more powerful CEOs are characterized by higher performance variability implying that powerful CEOs pursue policies which result in riskier outcomes. Therefore, powerful CEOs are more likely to influence board decisions towards pursuing risky policies.

Therefore, future work should assess the joint impact of bank boards and CEO power on bank policies. One potential line of enquiry could try to explain how board governance and CEO power interact. CEO power may increase with tenure and hence its effect on board oversight should be stronger as tenure increases. Another potential line of enquiry could focus on the role of CEO power in capturing the board in the period leading up to the financial crisis.

Taken together, this section argues that various board attributes can play a critical role in providing effective oversight into the functioning of bank executives. Another key mechanism through which bank boards can influence managerial behavior and their risk-taking incentives is through the structure of executive remuneration contracts. We focus on this issue in the next section.

STRUCTURING CEO PAY TO MITIGATE RISK-TAKING

Senior executives are responsible for the day-to-day management of the bank. The traditional setting in which CEO remuneration decisions are taken is laid out in Holmstrom (1982), where the board represents the interests of shareholders and evaluates performance of the manager. Boards influence executive behavior by overseeing, monitoring, and structuring

compensation policies. Consistent with this, DeYoung et al. (2013) show that US bank boards responded to expanded business opportunities after the US deregulation by embedding option-based equity incentives to encourage risk-taking. Another potential mechanism to embed contractual risk-taking incentives is by use of performance-based equity awards that induce managers to pursue risky policies that yield short-term payoffs (Bebchuck & Spamann, 2009; Federal Reserve, 2010).

The implications of such incentives on bank behavior and risk-taking preferences have come under increasing scrutiny (Bebchuk & Spamann, 2009; DeYoung et al., 2013; Thanassoulis, 2012). This is because compensating managers with instruments that induce risk-taking may well subordinate the interests of other stakeholder groups (Jensen & Meckling, 1976; John & John, 1993). Consistent with this view, Chen et al. (2006) show that there is a positive association between the percentage of option-based CEO wealth in total compensation and market-based measures of bank risk (e.g. systematic risk, idiosyncratic risk). Cheng, Harrison, & Scheinkman (2015) show that banks where CEOs held excess CEO pay, calculated as the regression residual of total CEO pay on firm size, had higher risk-exposure into subprime mortgage securities and higher return volatility. Bai & Elyasiani (2013) find that higher option incentives result in reduced bank stability and greater default risk. This association is also reflected in the choice of bank policies, with higher option-induced incentives resulting in riskier acquisitions (Hagendorff & Vallascas, 2011) and riskier investment policies (DeYoung et al., 2013; Mehran & Rosenberg, 2007).

However, over three decades of research on compensation has primarily focused on the link between equity-based compensation and risk-taking with little attention to other important components of CEO pay. Assessing alternate pay components is particularly important because ongoing policy reforms and emerging academic research have raised the

need for compensating executives with instruments that promote long-term stability (Bolton et al., 2015; Federal Reserve, 2010).

In the following subsections, we shed some light on debt-based pay as well as the vesting schedule of equity awards which could affect firm risk-taking. Empirical research on these issues will enrich our knowledge on different characteristics of CEO pay to arrive at a holistic picture of the incentives arising from CEO compensation.

Recalibrating CEO pay to creditor wealth and longer time-horizons

Inside Debt. One way to align the interests of CEOs with firm creditors involves debt-like instruments. A growing literature has shown that CEO pay consists of debt-like instruments, in the form of pension benefits and deferred compensation, and compensating CEOs with this so-called ‘inside debt’ can mitigate risk-taking (Cassel, Huang, Sanchez, & Stuart, 2012; Edmans & Liu, 2011; Sundaram & Yermack, 2007). The underlying rationale behind this is that CEOs with inside debt have a claim on bank cash flows because inside debt only becomes payable upon retirement. Crucially, these claims are unfunded and unsecured firm obligations, thereby putting the value of inside debt at risk if the firm defaults and exposing CEOs to the same default risk concerns faced by external creditors (Edmans & Liu, 2011). As a result, when paid with inside debt, the risk preferences of CEOs should converge with those of external creditors, implying that higher inside debt may mitigate risk-taking concerns in the banking industry.

The use of inside debt is widespread and, most executives hold large amounts of inside debt. Sundaram & Yermack (2007) show that 78% of large S&P firms in their sample had some form of inside debt arrangements, with an average CEO holding \$4.2 million in pensions. In the banking industry, Bennett, Guntay, & Unal (2015) show that 72% of banks held some form of inside debt in 2006, with an average CEO holding nearly \$3.1 million.

Despite the widespread use of inside debt amongst banks, only a limited amount of applied research has assessed the impact of inside debt on bank policies. DeYoung et al. (2013) point out that bank CEO incentives are more heavily geared towards the interests of shareholders than in other industries even though, equity makes up only a small proportion of a bank's balance sheet. It is therefore particularly important to understand if aligning managerial interests with the interests of external creditors dampens risk-taking.

More recently, Bennett et al. (2015) show a negative association between inside debt and a market-based measure of default risk. Bolton et al. (2015) also show that the mandatory disclosure of inside debt holdings of bank CEOs in 2006 was perceived positively by creditors, with higher inside debt associated with lower CDS spreads. Similarly, Bekkum (2015) reports a negative relation between CEO and Chief Financial Officer (CFO) inside debt and measures of subsequent market volatility and tail risk. Srivastav, Armitage, & Hagedorff (2014) show that bank CEOs with higher inside debt are associated with more conservative bank payout policies.

Although research has shown that inside debt helps to reduce risk, we know little about how inside debt affects the separate risk components (idiosyncratic risk and systemic risk) and, by extension, incentives to shift the risk of default onto the safety net. Future research can also aid ongoing policy discussions over CEO pay by establishing how any risk reductions are realized.

Finally, existing measures of inside debt have been developed for non-financial firms. For instance, Jensen & Meckling (1976) proposed that CEOs face no risk-taking incentives if the ratio of inside debt to inside equity (i.e. a CEO's personal leverage) resembles the ratio of a firm's outside debt to outside equity (i.e. firm leverage). More recently, Wei & Yermack (2011) suggest measuring the strength of inside debt incentives as the sensitivity of a CEO's

personal leverage to firm leverage. While such measures may be suitable for non-financial firms, their applicability to banks is questionable. This is because banks are highly leveraged making it nearly impossible for a CEO's personal leverage to match anything resembling the leverage of the bank she is leading.

Further, key bank liabilities such as deposits benefit from explicit guarantees. Therefore, the components of inside debt ratios do not compare like for like: in banks, inside debt ratios contain both insured debt in the form of deposits as well as more junior (and unsecured) bank debt. Therefore, future research will need to more accurately measure the incentives originating from inside debt for banks to gain a better understanding of how these incentives impact the risk-taking behavior of senior bank managers.

Characteristics of CEO Compensation Contracts. Next to inside debt, an alternative way to mitigate the risk-taking incentives inherent in bank CEO pay is to discourage the adoption of equity awards that motivate executives to focus on meeting short-term targets. Equity awards granted to firm executives are subject to vesting criteria, wherein executives receive their awards gradually over the next one to five years. Therefore, executives with a long vesting schedule are more sensitive to long-term stability since they may not receive awards if the firm defaults.

Mehran et al. (2011) note that around 49% of bank CEOs in their sample held option awards which vested within one year. If equity awards vest within a short time, the payoffs to bank CEOs are no longer sensitive to the much longer time horizon over which economic risks are realized. This may incentivize CEOs to pursue bank policies that maximize current equity payoffs at the expense of long-term instability.

However, Fahlenbrach & Stulz (2011) note that there is a lack of evidence to show that bank CEO pay resulted in short-termism. The authors find that bank CEOs held on to vested

equity and option grants before the crisis and subsequently bore huge wealth losses. This is in conflict with the widespread notion of pervasive short-termism inherent in CEO pay and it warrants further empirical research. A starting point for such an investigation could be the work of Gopalan, Milbourn, Song, & Thakor (2014) who devise a novel measure of CEO pay duration to reflect the level of short-termism underlying CEO pay. The authors define pay duration as the weighted average of the vesting schedule of options, stocks, and cash, with weights assigned according to the percentage contribution of each component to total pay.

Future research into CEO pay should also explore if the vesting-schedule of equity awards can affect risk-taking. Most critically, there is a need to assess if CEO pay in banking is more short-term in nature and causes higher levels of risk-taking than in other industries. Another challenge is to assess the mechanisms, such as the use of long-term deferred equity, through which CEO pay duration may be extended in order to promote long-term stability.

Relatedly, various equity awards are conditional on performance-based vesting criteria wherein CEOs can accelerate the rate at which their equity awards vest if they meet certain performance criteria (e.g. share price increases). This tends to significantly increase the value of the existing equity portfolio of CEOs and may result in giving CEOs stronger incentives to increase firm risk (Bettis, Bizjak, Coles, & Kalpahty, 2011; Brisley, 2006). Future work should therefore account for both the time- and performance-based vesting criteria of CEO pay and assess whether certain features of equity awards can exacerbate risk-taking concerns.

Taken together, our review highlights the need for widening the scope of the literature by assessing the role of alternate pay components in remuneration contracts. Specifically, boards can align managerial incentives with bank stability by using pay components that offer payoffs over an extended horizon such as the use of inside debt and long-term vesting conditions on equity awards.

The next and final section of this review examines the role of corporate governance arrangements in improving the role of effectiveness of risk oversight.

BANK RISK MANAGEMENT AND RISK EXPOSURES

The role of risk management is to evaluate the impact of a firm's current and future policies on its risk-exposure. A review of risk governance at major banks by the Senior Supervisors Group (2009), an international forum of senior representatives from various supervisory authorities, highlighted inadequate risk management practices behind the failure of banks to identify and control for their exposures to extreme events. Emerging literature on risk governance has also shown its importance for ensuring bank stability. For instance, Keys, Mukherjee, Seru, & Vig (2009) show that stronger risk management departments (measured by the share of top risk manager's compensation relative to the top five executives) originate less risky mortgage portfolios.

Aebi, Sabato, & Schmid (2012) show that banks where the Chief Risk Officer (CRO) directly reports to the board had stronger performance during the financial crisis of 2007-08. Ellul and Yerramilli (2013) provide evidence on the relationship between risk management and bank risk. The authors develop a Risk Management Index which consolidates different dimensions of the risk management function (e.g. the presence of a CRO on the board, experience on the risk committee, etc.) to show that banks with a higher risk management score in 2006 were less risky during the crisis. Lingel & Sheedy (2012) extend Ellul & Yerramilli's study by developing a risk management index in an international setting and show that banks with stronger risk management had lower risk over the period 2004-2010. The authors focus on a sample of large international banks in order to include the dynamics of different legal, cultural, and regulatory environments.

While prior literature has shown some evidence on the effectiveness of risk governance, some important questions on the topic remain unanswered. For instance, there is limited research that analyzes whether risk management functions should be rigid, that is, based on compliance or more focused on involving risk managers in key decisions without a formal system of compliance (Stulz, 2015). In this regard, Halls, Mikes, & Millo (2013) conduct a field study of two UK banks and show that the bank where risk management followed a rigid 'box-ticking' approach failed to control its risk-exposure.

More empirical and theoretical research along these lines will help to identify the antecedents of effective risk management. For instance, banks with effective risk management should be more likely to proactively monitor risk-exposures and change practice in response to crisis episodes during or after periods of poor performance. Relatedly, little is known about the determinants of the composition of risk management committees and how its composition affects bank risk-taking.

Another aspect of risk management that deserves more attention is a bank's risk culture. Mehran et al. (2011) and Stulz (2015) argue that risk management practices are shaped by the risk-taking culture within a firm. Ellul & Yeramilli (2013) posit that the risk culture and risk management function may be jointly endogenous, that is, banks which have a more pronounced culture for risk-taking may also be less likely to install an effective system of risk management. Thus, it is not risk management but corporate culture that determines risk (Stulz, 2015). Consistent with this, Fahlenbrach, Prilmeier, & Stulz (2012) show that risk culture is a strong determinant of bank risk-taking. The authors document that bank risk and performance during the recent financial crisis are positively related to their performance during the 1998 crisis (sparked by Russia's default on some of its debt), thereby suggesting that banks with persistent risk culture take more risks. More recently, Bouwman and

Malmendier (2015) also show that banks that have experienced macroeconomic and bank-specific shocks in the past are more likely to engage in safe lending practices and higher capitalization. One potential reason could be that a bank's culture is shaped by its history of experiencing and surviving such shocks which further influences its future risk-taking behavior.

While quantifying the risk culture of a particular bank is difficult to incorporate into empirical analysis, future work should attempt to identify various dimensions of risk culture and account for its role in influencing risk management practices in banks. Another important issue is to assess how different governance mechanisms interact with each other. For example, banks with a culture that promotes risk-taking may be more likely to have weak risk management systems and this could have an important bearing on the type of executives and directors this type of institution hires. By contrast, an effective system of risk management may be undermined if the board lacks expertise to conduct meaningful risk assessments. Future research therefore needs to jointly take into account the dynamics of board effectiveness and risk management in order to develop a holistic understanding of how different governance mechanisms interact with each other.

CONCLUSIONS

The purpose of this paper is to review the literature on the corporate governance of banks with a particular focus on the implications of governance for bank risk-taking. Current governance practices are based on the principle that corporate governance mechanisms are designed to protect shareholder interests with shareholders exercising control over bank operations and policies via the board of directors (Becht et al., 2011; Mehran et al., 2011). However, one of the lessons drawn from the recent crisis is the need to understand better how to design governance mechanisms that represent the interests of creditors and taxpayers, in

addition to bank shareholders, with the aim of controlling bank risk-taking more effectively (Basel Committee, 2014; Federal Reserve, 2010; Kashyap et al., 2008; Kirkpatrick, 2009).

Banks differ from non-banking firms in important ways that are relevant for risk-taking. Excessive leverage and the presence of government guarantees may exacerbate risk-taking incentives in the banking industry. Further, risk-taking will be beneficial for shareholders but detrimental for bank creditors and taxpayers who underwrite the type of guarantees that protect many bank liability holders from loss (Bhattacharya & Thakor, 1993; Merton, 1977). This literature review offers insights into how corporate governance can mitigate the risk-taking incentives which banks face.

In particular, we highlight three future strands of research on the internal governance of banks. First, there is a need to assess the impact of different board attributes on risk-taking. While prior research has largely focused on broad board measures (e.g. board size and board independence), our review encourages future research to focus on the more fine-grained aspects of how boards function, including the educational qualifications of directors and other personal characteristics. Second, empirical work has only recently begun to examine pay instruments that incentivize managers to focus on the long-term stability of banks. This review highlights the role of debt-based forms of compensation as a device to mitigate bank risk-taking. Finally, research needs to explore the risk management culture and risk management practices inside banks.

Future research should also address some of the fundamental governance issues for banks that remain unanswered to date. For instance, it will be interesting to explore the risk implications if banks represent the interests of creditors, taxpayers and shareholders on boards. In this regard, our study supports the conclusions of de Haan and Vlahu (2015) who posit that future research on bank governance should take into account regulatory distortions

and the role of large creditors within a broader governance framework. Moreover, we know very little about the inner workings of bank boards in terms of group dynamics and if such board processes can influence the choice of bank policies. More empirical evidence on the issues highlighted in this review will help develop a deeper understanding of bank behavior within governance systems and serve as an empirical basis for ongoing governance recommendations for sustainable bank risk-taking.

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NOTES

1. Arguably, there exist various other dimensions that resulted in bank fragility during the global financial crisis of 2007-09, such as inadequate bank capital (Hanson, Kashyap, & Stein, 2011; Kashyap et al., 2008), unregulated shadow banking system (Gennaioli, Shleifer, & Vishny, 2013), and the too-big-to-fail problem (Freixas & Rochet, 2013). However, the focus of our paper is on one such channel: governance failures.
2. While Leveraged Buyouts (LBO) are also highly levered, LBOs control agency costs of debt (e.g. risk-shifting) through various strategies such as the use of loan covenants, presence of LBO specialist sponsors who represent both equityholder and debtholder interests, and use of strip financing where investors hold both equity-like and debt-like instruments (Jensen, 1989; Opler, 1993)

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TABLE 1

Summary of Prior Literature on Bank Governance and Risk-taking

This table presents a brief overview of prior literature focusing on the impact of bank governance on risk-taking incentives.

Study	Governance Measure	Summary
Board Attributes		
Beltratti and Stulz (2012)	Shareholder-friendly board index collected by Institutional Shareholder Services (ISS)	<ul style="list-style-type: none"> • Risk Measures: Default Risk (Z-score); Equity Risk (Idiosyncratic component of Stock Volatility); Leverage Risk (Equity minus Tangible Assets scaled by Assets); Portfolio Risk (Fraction of Loan Writedowns to Assets) • Key Findings: Shareholder-friendly boards are positively associated with default risk, although this relationship is not entirely robust to different risk measures
Erkens et al. (2012)	Independent Directors	<ul style="list-style-type: none"> • Risk Measures: Default Risk (Expected Default Frequency); Equity Risk (Stock Volatility); Leverage Risk (Amount of Equity Capital raised) • Key Findings: No significant relationship between independent directors and default risk or equity risk. Banks with a higher fraction of independent directors reduced leverage risk by raising equity during the financial crisis.
Berger et al. (2014)	Demographics of Executive directors (Age, Educational Qualification, and Gender)	<ul style="list-style-type: none"> • Risk Measures: Portfolio Risk (Asset Density, Loan Portfolio Concentration) • Key Findings: Portfolio risk is positively associated with younger executives and female directors. Portfolio risk is negatively associated with the fraction of directors with doctorate.
Minton et al. (2014)	Financial expertise of independent directors	<ul style="list-style-type: none"> • Risk Measures: Equity risk (Stock Volatility); Leverage risk (Risk-weighted Capital Ratio); Portfolio risk (Fraction of Loans secured by Real Estate) • Key Findings: Boards consisting of higher amount of financial experts were positively associated with bank risk
IMF Report (2014)	Board Size Independent directors	<ul style="list-style-type: none"> • Risk Measures: Default Risk (Z-score and Distance-to-default); Equity Risk (Systematic component of Stock Volatility); Tail Risk (Expected Shortfall, Marginal Expected Shortfall, and Systemic risk) • Key Findings: Higher fraction of independent directors is associated with lower bank risk, although boards that have more financial experts are associated with higher risk.

Executive Pay Hagendorff and Vallascas (2011)	CEO pay-risk sensitivity or Vega	<ul style="list-style-type: none"> • Risk Measures: Default Risk (Merton's distance-to-default) • Key Findings: High vega banks pursue acquisitions that result in increasing default risk
DeYoung et al. (2013)	CEO pay-risk sensitivity or Vega CEO pay-performance sensitivity or Delta	<ul style="list-style-type: none"> • Risk Measures: Equity risk (Stock Volatility) • Key Findings: Higher Vega is associated with an increase in equity risk. Higher Vega results in shifting the business model of banks to non-traditional activities, i.e. a greater fraction of income from non-interest bearing activities and derivatives investment.
IMF Report (2014)	Fraction of equity- based pay	<ul style="list-style-type: none"> • Risk Measures: Default Risk (Z-score and Distance-to-default); Equity Risk (Systematic component of Stock Volatility); Tail Risk (Expected Shortfall, Marginal Expected Shortfall, and Systemic Risk) • Key Findings: Higher equity-based pay is associated with lower bank risk
Bennett et al. (2015)	CEO debt-based compensation	<ul style="list-style-type: none"> • Risk Measures: Default risk (Expected Default Frequency) • Key Findings: Higher inside debt is associated with lower default risk during the crisis
Bekkum (2015)	Fraction of CEO debt- based compensation	<ul style="list-style-type: none"> • Risk Measures: Tail Risk (Value-at-Risk, Expected Shortfall, Covariance); Equity Risk (Stock Volatility) • Key Findings: Inside debt is negatively associated with different measures of bank risk
Bolton et al. (2015)	CEO inside debt to equity-based compensation	<ul style="list-style-type: none"> • Risk Measures: Announcement effect on CDS spreads • Key Findings: Announcement of CEO inside debt holdings is associated with lower CDS spreads
Cheng et al. (2015)	Residual compensation	<ul style="list-style-type: none"> • Risk Measures: Equity risk (Stock Volatility) • Key Findings: Residual compensation is positively associated with equity risk
Risk Management		
Keys et al. (2009)	Risk Manager Power:	<ul style="list-style-type: none"> • Risk Measures: Portfolio Risk (Default rates on subprime loans)

Fahlenbrach et al. (2012)	Fraction of risk managers pay to top-5 executive pay Risk culture, as proxied by bank performance during the 1998 Russian crisis	<ul style="list-style-type: none">• Key Findings: Stronger risk management is associated with less risky subprime loan securitizations• Risk Measures: Default Risk (Bank Failures during the 2007-08 period)• Key Findings: Banks with persistent risk-taking culture performed poorly and were more likely to fail during the 2007-08 financial crisis
Ellul and Yeramilli (2013)	Strength and independence of risk management function	<ul style="list-style-type: none">• Risk Measures: Tail Risk (Expected Shortfall); Credit Risk (Fraction of Non-performing Loans)• Key Findings: Stronger Risk Management Index (RMI) is associated with lower tail risk exposure and better loan quality. RMI is also a strong predictor of bank tail risk exposures during the financial crisis
IMF (2014)	Presence of risk committee	<ul style="list-style-type: none">• Risk Measures: Default Risk (Z-score and Distance-to-default); Equity Risk (Systematic component of Stock Volatility); Tail Risk (Expected Shortfall, Marginal Expected Shortfall, and Systemic risk)• Key Findings: Banks with risk committee are associated with lower risk-taking
