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ESSAYS ON CORPORATE GOVERNANCE OF FINANCIAL INTERMEDIARIES

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ESSAYS ON CORPORATE GOVERNANCE OF FINANCIAL INTERMEDIARIES

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Abstract

This thesis comprises four papers that examine the effect of information advantage of bank executives and CEOs on bank risk taking and performance and also investigate to reveal which CEO power variables, which denote information advantage to the CEO, influence the likelihood of bank fraud and the likelihood of detecting fraud.

Paper 1 provides a theoretical, regulatory, structural, and historical analysis of US banks. The regulatory environment of banks has been changed dramatically as well as the structure of banks in the last three decades. Banks' financial intermediation role and opaqueness that comes from greater risk-taking make them special in corporate governance applications. It is known that regulations have the direct effect on bank corporate governance with the hands of regulators.

Paper 2 examines whether information advantage of the CEO can influence bank risk to add empirical evidence to hypothesised relationship from the perspective of the CEO power. CEO tenure and CEO network size that denote the sources of information advantage are used as the CEO power variables. The effect of CEO power on three measures of bank risk is assessed: Z-score, systematic risk, and systemic risk. Results from fixed effects and generalised method-of-moments (GMM) dynamic panel data estimations reveal that banks are more likely to take on more risks when CEO's have a relatively long tenure and large network. The results of the robustness tests provide the same connection between CEO power and bank risk.

Paper 3 explores whether institutional investors in publicly listed US banks can influence bank ownership structure and performance through a prior connection to newly appointed senior executives of the bank by employing a unique dataset. The impact of the connection on three measures of bank performance is assessed: non-interest income to total assets ratio, market beta, and Tobin's Q. Institutional investors increase their shareholding in banks after the appointment of a connected executive. Results of regressions reveal that the presence of connected executives is positively and significantly associated with developments in market beta and non-interest income, and negatively and significantly related to developments in Tobin's Q. The results as consistent with institutional investors with prior connections to bank executives having a significant information advantage relative to other shareholders in the bank on its likely future performance.

Finally, paper 4 contributes the corporate governance literature that has little to say about the likelihood of banks engaging in financial fraud. The commission of financial fraud by banks as partly reflecting that bank's culture, which is driven in large part by the bank's senior executives, especially the CEO. A unique dataset on financial fraud in publicly-listed US banks is employed to test for a link between fraud and CEO power that creates information advantage. The results from probit and partially-observed bivariate probit estimations suggest that banks are more likely to commit fraud and more likely to be detected by regulators if they have powerful CEOs measured by length of CEO tenure, Chair/CEO duality, size of CEO's network, and if the CEO is also a part-owner of the bank. Fraud also appears more likely to be committed by large banks with relatively poor balance sheets, raising the prospect that fraud (and powerful CEOs) can have adverse systemic consequences.

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List of Abbreviations

BCBS = Basel Committee on Banking Supervision
BIS = Bank of International Settlements
CAPM = Capital Assets Pricing Model
CEO = Chief Executive Officer
CRA = Community Reinvestment Act
CRO = Chief Risk Officer
FDIC = Federal Deposit Insurance Corporation
FED = Federal Reserve System
FFIEC = Federal Financial Institutions Examination Counsel
GAAP = Generally Accepted Accounting Principles
GMM = Generalised Methods of Movements
HHI = Herfindahl-Hirschman Index
HMDA = Home Mortgage Disclosure Act
M&A = Merger and Acquisition
MES = Marginal Expected Shortfall
NCUA = National Credit Union Administration
NIITTA = Non-interest Income to Total Assets
OCC = Office of the Comptroller of the Currency
OECD = Organisation for Economic Co-operation and Development
OTS = Office of Thrift Supervision
QTL = Qualified Thrift Lender
RMI = Risk Management Index
ROA = Return on Assets
ROE = Return on Equity
SCAC = Stanford Law School Securities Class Action Clearinghouse
SEC = US Securities and Exchange Commission
SES = Systemic Expected Shortfall
UK = United Kingdom
US = United States

General Introduction

1. Introduction

Today's complex and changing business environment makes the corporate governance of a firm vital in balancing the interests of stakeholders, such as shareholders, executive managers, customers, government, and community. The general definition of corporate governance refers to a set of rules, practices, policies, and regulations by which a firm is directed and controlled.

Among stakeholders, shareholders and executive managers play a crucial role in corporate governance, especially in principal-agent problem that refers to the conflict of interests between principals and agents. Berle and Means (1932) is the first example of the conceptual discussion of agency theory that argues separation of ownership and control. In the same vein, the principal-agent problem is a leading factor of agency theory as shown in the early examples of studies within the context of principal-agent problem (Fama, 1980; Fama and Jensen, 1983; Jensen and Meckling, 1976).

The debate surrounding the efficiency, effectiveness, and role of corporate governance in banks is motivated by the recent events in the US. The Sarbanes-Oxley Act of 2002, which was the result of the corporate governance scandals of the late 1990s, and the Dodd-Frank Act of 2010, which was released in order to defeat the malfunctioned banking system in 2008 financial crisis, are well-known examples of the reaction of the authority (Akyol et al., 2012; Bebchuk et al., 2002; Bebchuk and Fried, 2003; Bebchuk and Weisbach, 2010; DeYoung et al., 2013; Dimitrov et al., 2015; Jain and Rezaee, 2006; Larcker et al., 2011; Li et al., 2008; Pathan and Skully, 2010; Zhang, 2007). The main argument in this debate mostly focuses on the effectiveness of corporate governance mechanisms, the role of shareholders who suffer from the agent problem, and executive compensation that reflects the impact of an agent in the context of corporate governance (Acrey et al., 2011; Bainbridge, 2008; Barro and Barro, 1990; Bebchuk, 2009; Booth and Deli, 1996; Cai et al., 2009; Conyon and Sadler, 2010; Ertimur et al., 2011; Ertimur et al., 2010; Gormley et al., 2013; Greenstone et al., 2005; Lo, 2003; Thomas and Cotter, 2007).

In the banking context, an emerging number of studies examine the corporate governance structure of banks and how it differs from that of non-financial firms (Caprio and Levine,

2002; Devriese et al., 2004; Laeven, 2013; Macey and O'Hara, 2003). The four aspects are defined to point out the differences of banks: distinct regulations, large creditors, diffused debtholders, and high leverage (Laeven, 2013). Banks are highly regulated to decline the probability of failure to keep the system safe and sound. As large creditors, banks use loans to support the economic growth. On the other side, the majority of bank debts are transformed into bank deposits that are taken from a large number of depositors. Finally, the high average leverage ratio in banks is the result of maturity mismatches in the economy. The intermediation role of banks allows them to work with a high leverage ratio that might be severe for the non-financial firms. In detail, banks, which are heavily regulated by federal and state-level regulators in the US, have different characteristics than non-financial firms. The main function of banks is the intermediation role that balances systemic risk in the economy. Hence the failure of them delivers negative externalities (Flannery, 1998). To produce loan as the main product of commercial banks that are allowed to collect deposits, banks need to participate in the deposit market actively and deal with the maturity transformation, which has a potential of coordination failure, between depositors and lenders (Diamond and Dybvig, 1983). This partly explains why banks are subject to deposit insurance; the main function of deposit insurance is to prevent depositors and whole financial system from the adverse consequences of the failure of banks.

The structural differences of banks make governance problems serious and decline the use of governance mechanisms that are designed for the non-financial firms (Caprio et al., 2007; Laeven et al., 2014). In non-financial firms, corporate governance mechanisms are intended to solve the principal-agent problem on behalf of shareholders. In the banking industry, the external stakeholders are also essential in assessing the functionality of corporate governance mechanisms. To the extent that the corporate governance mechanisms in the banking industry are needed to be adopted in order to satisfy the expectations of depositors, creditors, and also taxpayers in addition to the expectations of shareholder (Becht et al., 2007).

The literature that points out the strong differences of corporate governance of banks grows with covering different dimensions. These dimensions are related to capital structure, the complexity of banking assets, and country-level corporate governance

applications (Becht et al., 2011; Caprio and Levine, 2002; Devriese et al., 2004; Laeven, 2013; Mehran and Mollineaux, 2012). The leverage of banks is relatively high compared to non-financial firms (Avgouleas and Cullen, 2014). In an empirical example, by using the historical FDIC data, Gornall and Strebulaev (2015) point out that the leverage of the financial firms (debt to assets ratio) is between 87 and 95 percent; whereas the maximum leverage of non-financial firm is not more than 30 percent. On the other hand, Laeven (2013) shows that the typical leverage ratio of banks is ten base point higher than non-financial firms. The higher leverage of banks may lead severe moral hazard problems that lead higher agency costs between shareholders and debtholders (Laeven, 2013; Macey and O'Hara, 2003). The reason for the moral hazard problem is the risky investments that are decided by CEO. The positive return of risky investment has a positive effect on benefits of shareholders while debtholders can only take their fix payments. Under the condition of fail of risky investment, despite the decline in the value of collateral to debtholders, fix payments are guaranteed while the benefits of shareholders decline (John and Qian, 2003).

Asset quality of banks is directly related to the loan quality, which is hard to observe at complex financial instruments for longer periods (Ferrarini, 2015). Furthermore, quickly altered nature of risk structure of banks makes verifying and managing risks complex compared to non-financial firms. For financial institutions, board members and outside investors cannot easily track these perpetual changes in risks (Carlin et al., 2013; Cebenoyan and Strahan, 2004; Dell'ariccia et al., 2012; Purnanandam, 2011). From shareholders' point of view, the complexity of determining risks creates information asymmetry to control managers. On the other hand, debtholders cannot influence banks regarding shifting risks. Both of these cases increase agency costs and make monitoring difficult to imply. Another side effect of the complexity is the difficulties of constructing effective incentive contracts. The short-term fluctuations in earnings and measurement uncertainties of benefits allow managers to manipulate their compensation plans (Levine, 2004). Despite the complexity and its side effects on corporate governance implications, strict regulations of the industry and disclosure requirements, which make banks transparent, keep the complex nature of banking assets at the acceptable level. In theory,

the regulator can take monitoring role of the board on behalf of individual shareholders to control for agency costs (Dewatripont and Tirole, 1994).

Country-level corporate governance with the context of banks is also discussed in the literature. By using firm-level data from developed countries, Hagendorff et al. (2010) show that strict regulations of countries affect the design of governance structure at the firm level and promote firm-level governance differences. By controlling the country-level legal investor protection, Bruno and Claessens (2010) point out that good governance practices of the companies appear in stringent legal environments. Berglof (2011) argues that no universal corporate governance strategy generates the same output in different countries. He claims that the firm link between the macro-level corporate governance that consists of the country-level corporate governance variables (i.e., a country's laws, its culture and norms) and micro-level corporate governance that covers firm-level corporate governance variables increases the potential of good governance in banks.

Even though the literature tends to differentiate corporate governances of banks and non-financial firms, the principal-agent problem has similar consequences for both these types of firms. As a matter of fact, the principal agent problem is exacerbated because of the presence and influence of depositors and external stakeholders. One of the reasons of principal-agent problem is different information level of principals and agents. Verrecchia (2001) documents that managers do not voluntarily share information on bad projects, poor performance, and accounting irregularities with outside directors since the information share is detrimental to their interests.

The foundation of principal-agent problem in banks and non-financial firms relies on the same information asymmetry theory. In definition, information asymmetry refers to information differences and conflicting incentives between principals and agents (Akerlof, 1970; Alchian and Demsetz, 1972). Demsetz and Lehn's (1985) information asymmetry hypothesis is widely based on imperfect information assumptions and argues that monitoring by the board is relatively cost efficient with low asymmetric information, suggesting that the control of board on management is efficient with the low level of cost. Similarly, Ajinkya et al. (2005), Song and Thakor (2006), Chen et al. (2012), and

Hermalin and Weisbach (2012) argue that the efficiency of monitoring executive managers depends on the quality and frequency of information released. Cai et al. (2015) detect the negative relationship between the direct monitoring of boards that consists of proportionally more outside directors and information asymmetry on CEO equity incentives.

By differentiating the components of principal-agent problem, Watts (2003) discusses the effect of financial reporting on information asymmetry between existing and potential creditors of firms. From a broader perspective, Glosten and Milgrom (1985), Welker (1995), and Lang and Lundholm (1996) point out that the market efficiency and lower of the cost of the firm capital depend on the absence of information asymmetry in the overall market.

By analysing corporate financing and investment decision, The theoretical discussion of information advantage of managers is provided by Myers and Majluf (1984) and Miller and Rock (1985). Raheja (2005), Harris and Raviv (2008), and Adams et al. (2008) argue the effect of firm-specific information of executives on their decision-making processes. Kanagaretnam et al. (2007) assert that informed traders transact with information advantage while traders, who suffer from information asymmetry, transact for liquidity reasons. In a similar vein, by taking the geographical location of investors into consideration, Kang and Kim (2010) discuss the information advantage of domestic investors on foreign investors in which their investment choices shaped by information asymmetry.

Operating with high leverages, working with increased number of debtholders and creditors, and being the subjects of distinct regulations are the main differences of banks than non-financial firms (Laeven, 2013). These differences indicate that corporate governance of banks is also different than corporate governance of non-financial firms. Despite the growing corporate governance literature on information advantage (or information asymmetry), bank corporate governance still provides grey areas that are needed to be investigated.

2. Research questions and thesis structure

The aforementioned aspects of bank corporate governance, it would be argued, make it worth of PhD study. Overall, the main theme of this thesis is to examine how information advantage of the CEOs and other senior executives affects bank risk taking, performance, and ownership structure, and also, as a detailed case, it is aimed to investigate the effect of information advantage of CEOs on bank fraud.

To grasp the dynamics of the US banking system, it is worthwhile first to look back in time to investigate the turning points on regulations in recent US banking history and to focus on the theoretical and structural analysis of US banks and bank regulators. In this respect, the first main research question targeted within this study is;

1. Which regulatory changes have influenced the structure of the US banking industry?

Paper 1 addresses this research question in detail by sketching out the historical analysis of changes in regulations of US banking industry. The regulatory changes that denote de-regulation period before the recent financial crisis and re-regulation period of the 2010s are investigated. Paper 1 also investigates the historical changes in performance, size, asset, loan, and deposit structures of US banks. Also, Paper 1 points out the differences in bank corporate governance in the literature. As a final step, Paper 1 summarises the current and historical structures of US bank regulators as well as the legal backgrounds of them.

Following the historical, structural, and regulatory review, Paper 2 focuses on information advantage of the CEOs of banks that can influence bank risk taking.

Previous studies of risk taking have endeavoured to examine the corporate governance-related factors. CEO incentives and different compensation plans of managers have become a re-visited topic of corporate governance in the literature. Corporate scandals at the beginning of the 2000s, regulatory changes (Sarbanes-Oxley Act of 2002 and Dodd-Frank Act of 2010), and the global financial crises have made CEO incentives and different compensation plans of managers re-visited topics of corporate governance in the

literature. Especially, their effect on firm risk taking become popular in the literature. May (1995), Jin (2002), Rajgopal and Shevlin (2002), Nam et al. (2003), and Coles et al. (2006) have pointed out that there is a significant relationship between CEO incentives and firm risk taking. Wright et al. (2007) reported the significant association between fixed incentives of managers and firm risk taking. From another perspective, Low (2009) investigated the effect of equity-based compensation of executives and assessed the effect on managers' risk-taking behaviour.

In addition to the CEO incentives and compensation plans of managers, different factors that affect the corporate governance and risk-taking of firms are also investigated in the literature. Drew and Kendrick (2005) argued the effect of culture, leadership, alignment, structure, and system of a firm on the enterprise risk. Ferreira and Laux (2007) examined the relationship between corporate governance policy and idiosyncratic risk. As a part of corporate governance policy, John et al. (2008) investigated investor protection and its effect of firm risk taking. As another part of corporate governance policy, King and Wen (2011) examined the shareholder governance and its effect on managerial risk taking. In an international setting, Kleffner et al. (2003), Nguyen (2011), Nakano and Nguyen (2012), Huang and Wang (2015), and Faccio et al. (2016) investigated the corporate governance-related factors and firm risk taking.

In bank risk-taking concept, the literature provides studies on corporate governance. Pathan (2009), Ferrero-Ferrero et al. (2012), Berger et al. (2014), and Minton et al. (2014) examined board structure and board characteristics in firm risk-taking concept. Saunders et al. (1990), Wright et al. (1996), Laeven and Levine (2009), and Pathan (2009) studied on investor protection and ownership structure. In addition to board and ownership structure, Pathan (2009), Acrey et al. (2011), Berger et al. (2014), Serfling (2014), Adhikari and Agrawal (2016), Cain and McKeon (2016), Faccio et al. (2016), and Buyl et al. (2017) investigated the CEO characteristics on risk taking. Gray and Cannella (1997), Coles et al. (2006), Hagendorff and Vallascas (2011), Neacsu et al. (2014) examined bank CEO incentive and compensation on bank risk taking.

The information asymmetry concept and information advantage of agents and principals against other stakeholders is a gap in the literature. The network size of the CEO that

indicates the probability of providing information advantage is not employed in studies before. The tenure of the CEO that shows the time of individuals in the same firm is used in the literature (Bloom and Milkovich, 1998; Cain and McKeon, 2016; Chakraborty et al., 2007; Coles et al., 2006; Hirshleifer et al., 2012; Muscarella and Zhao, 2015; Ryan and Wang, 2012; Serfling, 2014; Simsek, 2007). On the other hand, these studies used the tenure as a control variable, and systematic analysis of the effect of tenure on risk taking was not conducted. A limitation of the established literature mentioned above on bank corporate governance and risk-taking is that these studies pay little attention to information asymmetry and information advantage of agents in bank risk taking.

By focusing on the principal-agent problem between CEO as an essential part of management team and shareholders (Jensen and Meckling, 1976), Paper 2 addresses the aforementioned gaps in the literature by examining the rationale behind bank risk taking when the CEOs have information advantage that is obtained from CEO power (longer CEO tenure and larger CEO network size) and asks the research question;

2. Do network size and tenure of the CEOs affect bank risk?

CEO power variables (CEO tenure and CEO network size) are employed as the main determinants of bank risk. By following Laeven and Levine (2009), Chen et al. (2006), and Acharya et al. (2017), Z-score, systematic risk, and systemic risk are employed as bank risk measures. CEO characteristics (CEO age, CEO gender, CEO experience, CEO education), board characteristics (board size and board independence), bank specific variables (liquidity, leverage, loan loss provisions, capital-asset ratio, cost-to-income, return on assets, and size), and ownership structure variables (institutional ownership, individual ownership, and HH-Index as ownership concentration variable) are employed as control variables by following the relevant literature. Also, the recent financial crisis is controlled by using the relevant binary variable. Following Laeven and Levine (2009), the effects of tenure and network size of the CEOs on each bank on risk proxies is analysed by utilising a fixed effects model. Also, by following Levine et al. (2000), the models are re-utilized by using generalised method-of-moments (GMM) dynamic panel data estimator to avoid endogeneity concerns. Two robustness tests are implied to verify the sustainability of the fixed effects and GMM model estimation results. First, the

potential information advantages of senior executives and board members are considered, and executive power variables (executive tenure and executive network size) are employed rather than CEO power variables. Second, the sample is re-organized by covering the period before the pass of Dodd-Frank Act of 2010. Both of these robustness tests are employed by re-estimating the models. Results suggest that publicly listed US banks take more risk where CEOs have power. Particularly, information advantages related to longer tenure and larger network size of the CEOs lead banks to take more risk.

Subsequently, paper 3 shifts the attention of the thesis to a variant of the classic principal-agent problem. The conclusions of paper 2 suggest that network size of executives and CEOs increases bank risk. Additionally, the similar relationship between the tenure of executives and CEOs and bank risk is detected. Paper 3 aims to examine information asymmetry, specifically information advantage of executives, on performance and ownership structure of banks. Specifically, paper 3 examines how newly appointed executives to affect bank performance and how newly appointed executive affiliated institutional investors to change bank ownership structure. Also, the typical principal-agent problem denotes the conflict between shareholders and professional managers (Fama, 1980; Fama and Jensen, 1983; Jensen and Meckling, 1976). In addition to this classic view, Gilson and Gordon (2003) argued the conflict between controlling and non-controlling shareholders. The aim of paper 3 is to provide empirical evidence of a third dimension that denotes the conflict between current shareholders and potential shareholders.

A considerable amount of literature is published on insiders, who represent the shareholders. Historically, studies investigating the effects associated with insiders focus on the insider gain from trading the securities. The first serious analyses of insider gain emerge during the 1960s. These early studies report abnormal returns of insider trading in the first three-year period of the holding; the gains are ranged from 3 to 30 percent (Finnerty, 1976; Jaffe, 1974; Lorie and Niederhoffer, 1968). Despite the modest insider results that are estimated for different time periods, the recent researches also provide insider gains at different holding periods. For the US evidence, a recent study by Ravina and Sapienza (2010) reported that insiders use the superior information of their firms when trading. Similarly, Fidrmuc et al. (2006), Seyhun (1992; 1986), Jeng et al. (1999),

Friederich et al. (2002), and Betzer and Theissen (2009) also provide similar results. The studies that are mentioned above do not take any previous connection between executives and shareholders.

On the other side, the literature has explored the ownership structure and potential benefits. Shleifer and Vishny (1997; 1986), Chung and Zhang (2011), Bhagat and Bolton (2013), Knyazeva et al. (2013), and Dimson et al. (2015) discussed ownership structure as a tool for reducing agency costs and increasing firm value. In detail, Anderson and Reeb (2003) and Villalonga and Amit (2006) argued the effect of family ownership in the US context. Broadly, Nofsinger and Sias (1999), Gompers and Metrick (2001), Badrinath and Wahal (2002), Bennett et al. (Bennett et al., 2003), Ali et al.(2004), Cai and Zeng (2004), Ke and Petroni (2004), Ke and Ramalingegowda (2005), Pinnuck (2005), and Baik et al. (2010) investigated the effect of institutional ownership on firm performance. Notably, Bushee and Goodman (2007) and Yan and Zhang (2009) pointed out the informed institutional investors and their effect on firm performance.

The literature on the network that aims to investigate the effect of social and professional networks on corporate governance structure is emerging. Burt (1992), Haunschild (1993), Uzzi (1996), Cross and Cummings (2004) and Inkpen and Tsang (2005) discussed the benefits of networks. In an empirical study, Courtney and Jubb (2001) showed the positive effect of networks on increased efficiency of advising function of the board of directors. The literature on financial firms also investigates the effects of networks. Hong et al. (2005), Cohen et al. (2008) and Kuhnen (2009) investigated the effect of social ties on mutual fund industry. In recent studies, Shue (2013), El-Khatib et al. (2015), and Fracassi (2016) examined the effect of social ties on performance.

The aforementioned literature broadly discusses the effects of insiders, ownership structure, and networking on performance and efficiency of corporate governance mechanisms. The missing part of the literature is related to the invisible networks and their effect on performance and ownership structure. Especially, the gap in bank corporate governance literature provides a playground for researchers. By considering a different perspective of the principal-agent problem between controlling shareholders and non-controlling shareholders (Gilson and Gordon 2003), Paper 3 asks the research questions;

3. "Do institutional investor-connected executives affect the listed US bank performance and ownership structure?"

The methodology applied is as follows. After reviewing the detailed biographies of more than 10,000 board members and executive managers, the 'institutional investor-connected executive' tool is designed to provide the relationship between the institutional investor and the target bank by following Cai and Sevilir's (2012) methodology. For the univariate analysis, the data is grouped as "before appointment" and "after appointment" according to the appointment dates of the institutional investor-connected executives. The reason of the construction of univariate analysis is to detect the mean differences of ownership groups and measures that are used to perceive the purpose of connected executives. For the multivariate analysis, three performance measures are detected to measure the profitability (non-interest income to total assets ratio), market integration (market beta), and value (Tobin's Q). By following Engelberg et al. (2012), the relationship between bank performance and appointment of the institutional investor-connected executive by utilising the pooled cross-sectional OLS regressions. Executive related variables (executive age, executive tenure, and executive gender), bank specific variables (CAMELS ratios – capital allocation, asset quality, management capabilities, earnings, liquidity, sensitivity), bank size, ownership structure variables (institutional ownership, individual ownership, public ownership, other ownership, and HH-Index as concentration variable), and industry related variables (GDP change, interest rate change, and market concentration) are employed as control variables. The univariate analysis states that the increase of institutional ownership percentage at the connected sample is greater than the increase in institutional ownership percentage at control sample. Multivariate analyses of profitability and market integration show that the coefficients of the connected executive are positive and statistically significant. On the other hand, multivariate analyses of bank value indicate that the coefficient of the connected executive is negative and significant. The forwarded estimations and robustness tests provide similar results. The overall results suggest that banks become profitable, fully integrated to the market, and not expensive after the appointment of institutional investor connected executives.

Subsequently, paper 4 switches the attention to CEO power, as the source of information advantage that they use. In organisational behaviour, leaders have potential to change the

culture of the organisation (Baron and Hannan, 2002; Deal and Kennedy, 2000; Detert et al., 2000; Schein, 1985). The CEO has a unique position that allows the CEO to decide the culture, reach the information what they need, and decide the affairs of the firm (Berson et al., 2008; Giberson et al., 2009). If CEOs are powerful in a firm, the question arises as to how to detect they use their power.

The literature on corporate fraud discusses the conditions that lead the firm to involve into the fraudulent activities. Yeager (1980) and Braithwaite (1989) discussed that firms develop a normative position in response to demands of criminal law and regulatory requirements. Also, Jackall (1989) pointed out that the number of fraudulent activities that the firm involved is correlated with the culture of the firm. By taking the importance of CEO in determining the culture of the firm into consideration, connecting the effect of CEO and the firm's tendency to the fraudulent activities is reasonable.

In the literature, the definition of financial fraud varies. Alexander and Cohen (1996), Pickett and Pickett (2002), Pusey (2007), Fletcher (2007), Henning (2009), Hansen (2009), Gottschalk (2010), Gillian (2012), Davidson (2015) provided definitions of fraud by using different perspectives. Despite the unclear definition of fraud, there is a considerable literature that argues the reasons for a firm's fraudulent activity. Burns and Kedia (2006), Goldman and Slezak (2006), Efendi et al. (2007), Peng and Röell (2008), Johnson et al. (2009), and Armstrong et al. (2010) discussed the connection between financial fraud and executives' equity compensation. From another point of view, Beasley (1996), Dechow et al. (1996), Uzun et al. (2004), Agrawal and Chadha (2005), and Nguyen et al. (2016) investigated the effect of board independence and board's financial and accounting expertise. There is an emerging literature that discusses the accounting irregularities and financial crime. Alexander and Cohen (1996), Dechow et al. (1996), Palmrose et al. (2004), Farber (2005) Erickson et al. (2006), Xu et al. (2006), Harris and Bromiley (2007), Elayan et al. (2008) Hennes et al. (2008), Johnson et al. (2009), Armstrong et al. (2010), Jayaraman and Milbourn (2014), and Khanna et al. (2015) investigated the irregularities as corporate fraud.

The literature that investigates the effect of fraud on corporate governance provides some studies. Karpoff and Lott (1993), Beatty et al. (1998), Bhagat et al. (1998), Karpoff et al.

(2008), Karpoff et al. (2008), and Wang et al. (2010) investigated the reputational effect of financial fraud on firm and IPO values and wealth loss. In the same manner, Karpoff et al. (1999) and Gande and Lewis (2009) pointed out the effect of firm size on the negative stock return after the investigation of fraud. Murphy et al. (2009) employ a sample of the allegation of corporate fraud and measure the effect of these allegations on offender firm profitability and risk. Khanna et al. (2015) investigated the effect of CEO networking on the risk of corporate fraud while Nguyen et al. (2016) conducted research that aims to decide whether the board functions can prevent misconduct in banks.

On the other hand, the limited number of studies in the literature argues the CEO characteristics that are essential to shape the information advantages of CEOs and fraud. As an empirical correction of Jensen and Meckling's (1976) principal-agent problem-related theoretical study, Hermalin and Weisbach (1998) indicated that CEO could build own decision-making autonomy and influence the selection of other board members with increased length of tenure. In fraud context, Beasley (1996) reported the negative and insignificant relationship between CEO tenure and fraud. For employing as a control variable, Nguyen et al. (2016) provided the positive relationship. CEO ownership in balance is another characteristic that is linked to information advantage. Holderness and Sheehan (1988) and Morck et al. (1988) investigated the U shape significant relationship between CEO ownership and firm performance. In weak corporate governance condition, the effect of CEO ownership is exacerbated. Lilienfeld-Toal and Ruenzi (2014) showed that CEO ownership increases the stock price returns in case of weak corporate governance. The connection between CEO ownership and fraud was the field with no investigation. The only exception was Khanna et al.'s (2015) work that shows the positive relationship. CEO duality that indicates the CEO's chairman seat in the same firm is another CEO characteristics that shows the power of information. Finkelstein et al. (2009) argue that the effect of CEO duality on firm performance. Gove and Junkunc (2013) pointed out the disrupted monitoring function of the board of directors in the case of CEO duality. In literature related to fraud, there are a couple of studies investigated the effect of CEO duality on fraud. For instance, O'Connor et al. (2006) reported that the likelihood of fraud increases by the indirect effect of CEO duality in some cases. CEO network size is another CEO characteristics that indicate the information advantage of the CEO. Useem

(1982), Engelberg et al. (2012), and El-Khatib et al. (2015) are the examples of studies that investigate the relationship between the network sizes of executives and corporate governance structure of the firm. It is clear that connection between the CEO characteristics that indicates information advantage of the CEO and fraud have never been taken into account by previous non-financial and bank corporate governance related literature.

By considering the principal-agent problem between CEO as part of the management team and shareholders (Jensen and Meckling, 1976), Paper 4 addresses the gaps above in the literature by examining the rationale behind likelihood of fraud of banks when the powerful CEOs are in charge and asks the question;

4. Do powerful CEOs increase the likelihood that US banks will engage in financial fraud?

Following the fraud triangle theory and planned behaviour theory at the individual level and agency theory at the bank level, CEO power characteristics – such as CEO tenure, CEO ownership, CEO duality, and CEO network size – are considered as the main determinants of the likelihood of bank fraud. The effects of these determinants on the likelihood of bank fraud are analysed using probit, which allows the interpretation of the likelihood of fraud, and bivariable probit, which permits the interpretation of the likelihood of detecting fraud, models as different forms of limited binary variable models. The sample is reorganised according to repeated fraud cases and the difference between technical and non-technical fraud cases and re-estimated to verify the results of the estimations. Firstly, each CEO power variable is estimated on the binary variable of fraud to catch the individual effects of each CEO power variables. Subsequently, all CEO power variables are estimated together to measure the complete effect of whole CEO power variables. CEO related variables (CEO age, CEO gender, experience, and education), board related variables (board size and board independence), bank specific variables (leverage, ROA, liquidity, loan loss provisions, capital-asset ratio, cost-to-income, and size) are employed as control variables in probit estimations. Also, fraud detection variables (excessive asset growth, abnormal ROA, adverse stock dummy, abnormal stock turnover, abnormal stock volatility, and news ratio) are employed because of the special

setting of bivariate probit estimation that differentiates committing and detecting of fraud. The effects of the recent financial crisis, regulatory effectiveness that indicates the effectiveness of US bank regulators, and Dodd-Frank Act of 2010 is controlled by employing dummy variables. The results from probit analyses with all sample settings suggest that the likelihood of finding that a bank had engaged in financial fraud is greatest where CEOs are more powerful as measured CEO tenure and whether CEOs have an ownership stake in the bank. The results from bivariate probit analyses that are constructed to employ variables in order to gauge the likelihood of detecting fraud with all set of samples suggest that the likelihood of being detected by a bank regulator in the US is greatest where CEOs are highly tenured, and their equity-based compensation is higher than their direct compensation (salary and bonus). Overall, the results indicate that principal-agent problem become distinct when the CEO has more power that allows the use of information advantage, even in the case of fraud.

Overall, papers of the thesis generally focus on information advantage of executives (information asymmetry of other players in banking industry) and its effect on bank risk taking, performance, and financial fraud. Empirical analyses of the thesis show that information advantage of executives, which is an essential part of the corporate governance, has significant effects in risk-taking, performance, and corporate fraud.

3. Contribution to the literature

The thesis makes contributions to the existing bank corporate governance literature in understanding the effect of information advantage of bank senior executives and CEOs on bank risk and performance as well as the likelihood of fraud. Different than the existing literature, CEO power is employed as an indicator of bank risk-taking and performance. Additionally, CEO power is also employed as an indicator of financial fraud.

Contribution to the literature can be summarised as follows;

- Paper 1 provides an overview by analysing the theoretical, structural, and historical backgrounds of the US banking industry. In detail, the cycle of regulatory changes and its effect on banking activities are linked to the corporate

governance structure of banking industry. Additionally, legal origins of the regulators and their performance evaluation are essential parts of Paper 1.

- Unlike any other earlier study (to author's knowledge), Paper 2 employs CEO power variables as indicators of information advantage and investigates the effect of CEO power on bank risk-taking by employing a set of control variables. Paper 2 finds that information advantages related to larger network sizes and longer tenures of CEOs lead banks to take more risk. The results (paper 2) indicate that bank risk increases when executives have larger network size and longer tenure in the bank. Moreover, bank risk increases when CEO has larger network size and longer tenure.
- By employing a unique dataset that consists of professional networks of board members and professional managers of publicly-listed US banks, Paper 3 is the first study (to author's knowledge) that investigates the effect of institutional investor-connected executives on bank performance. It is observed that previous connections of executives affect the bank performance. The effect of appointment of the institutional investor-connected executive on bank performance holds for a one-year period. It is also found (paper 3) that the institutional investor increases the investment in the bank after the appointment of the institution investor-connected executive. Thus, the information advantage of the connected executive shapes the investment decision of the institutional investor.
- Paper 4 is the first study (to author's knowledge) that examines the effect of CEO power on bank fraud. It finds that the likelihood of finding that a bank had engaged in financial fraud and the likelihood of detecting fraud by regulators increases where CEOs are more powerful. It is also found that principal-agent problem become distinct when the CEO has more power that allows the use of information advantage.

The right form of regulations is essential in financial markets. Highly restristed banking industry eliminates the volatility and bring stability by promoting safety and soundness of banks. On the other side, more constraints in banking industry might affect the profitability of banks. In this manner, it is essential to find out the correct form of regulations in banking industry does not only allow the banks to operate fairly, but also

promote the entire economy. First and foremost, the thesis emphasises the importance of bank corporate governance on risk management, performance evaluation, and enforcements. Broadly, the findings of the thesis point out that regulators should closely monitor the bank management teams by considering the selection-bias.

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Paper 1

Theoretical, Regulatory, Structural, and Historical Analysis of US Banks

Abstract

This paper provides a theoretical, regulatory, structural, and historical analysis of US banks. Even though the recent financial crisis affected the profitability and efficiency of banks negatively, banks controlled one-fourth of total assets of US financial intermediaries with a volume of $15.5 trillion in 2015. In the last few decades, the regulatory environment of banks has been changed dramatically as well as the number and size of banks. After the deregulation period of the 1990s and early 2000s, the strict regulations have been established with Dodd-Frank Act of 2010. Banks' financial intermediation role and opaqueness that comes from greater risk-taking make them special in corporate governance applications. In addition to the mechanisms that aim to increase the efficiency of monitoring and advising role of the board of directors and protect investors, regulation has a direct effect on bank corporate governance with the hands of regulators.

1. Introduction

With the function of transferring funds from saving units into investment units, the banking system plays a crucial role in the economy. In other words, the financial intermediation role of banks supports the economic growth by increasing the efficiency and volume of funds flowing from savers to borrowers (Levine et al., 2000). Additionally, banks also change the maturity of funding by producing new types of contracts. In the US, the concept of 'banking' mentions a collection of financial institutions. The well-known examples are commercial banks, investment banks, thrift institutions, finance companies, and insurance companies. Regarding total assets, commercial banks (from now on referred to as banks) that collect most of their funds from customer deposits is the largest financial institution group in the US.

The US banking industry has witnessed dramatic regulatory changes in the last two decades. The Dot-com bubble at the end of the 1990s was the start of the deregulation period; the separation of commercial and investment banking was abandoned at this time. The Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010 that are the results of one of the severe financial crises in the US has been the start of the regulation period.

In term of the size that is measured by the total assets, as shown in Table 1, depository institutions that cover banks, thrifts, and credit unions are the largest groups of financial intermediaries in the US. For the given period from 2000 to 2015, depository institutions hold an average of 23.18 percent of the US financial intermediaries' assets, compared with an average of 21.95 percent for mortgage finance companies and funds and an average of 20.29 percent for pension funds that include private and public pension funds. In this period, the percentage distribution of assets that depository institutions hold does not show a huge fluctuation over time. On the other hand, new information technologies, changing and increase in competition, and dynamic regulatory environment are the factors that explain the hike in percentages of mortgage finance, mutual funds, and securities firms (brokers, dealers, and funding corporations) for the last forty years. Despite the fact that half of the financial intermediaries' total assets was held by

depository institutions four decades ago, depository institutions, especially commercial banks, continue to be important intermediaries of the economy (DeYoung, 2012).

Table 1: Percentage distribution of assets at US financial intermediaries between 2000 and 2015

Year	depository institutions	insurance companies	pension funds	Finance Companies	Mortgage	Mutual funds	Securities firms	Total
2000	22.80	12.23	22.15	3.35	19.86	16.03	3.59	100.00
2001	23.09	12.07	21.64	3.28	21.03	14.72	4.15	100.00
2002	24.05	12.17	20.99	3.26	22.95	12.94	3.65	100.00
2003	22.91	12.20	20.52	3.36	22.80	14.29	3.92	100.00
2004	22.48	11.85	19.94	4.01	23.02	14.72	3.98	100.00
2005	22.50	11.47	19.44	3.66	23.80	14.93	4.19	100.00
2006	22.06	11.17	18.79	3.38	24.06	15.63	4.90	100.00
2007	22.40	10.90	18.29	3.17	24.12	15.98	5.13	100.00
2008	25.97	10.62	18.20	3.24	25.58	12.51	3.88	100.00
2009	23.74	10.99	19.44	2.83	24.59	14.86	3.55	100.00
2010	23.17	11.14	20.96	2.62	22.72	15.97	3.42	100.00
2011	23.63	11.00	20.57	2.48	21.30	15.44	5.58	100.00
2012	23.21	11.03	20.80	2.26	20.03	17.09	5.60	100.00
2013	23.06	10.98	20.93	2.08	18.79	19.33	4.82	100.00
2014	22.75	11.26	20.76	2.02	18.12	20.71	4.38	100.00
2015	23.11	11.04	21.24	1.97	18.42	20.16	4.05	100.00

Source: Federal Reserve System Flow of Funds Accounts.

2. Structural view of US commercial banks

2.1. Change in the number of banks

As of 31st of December 2015, the number of banks is 5,340 in the US, and there is a downward trend in number of banks. The average number of federal or state-chartered banks, as shown in Table 2, is 13,873 in the 1930s and the highest number was reached in 1970s. More than 95 percent of these banks are community banks that held less than $1 billion of assets.

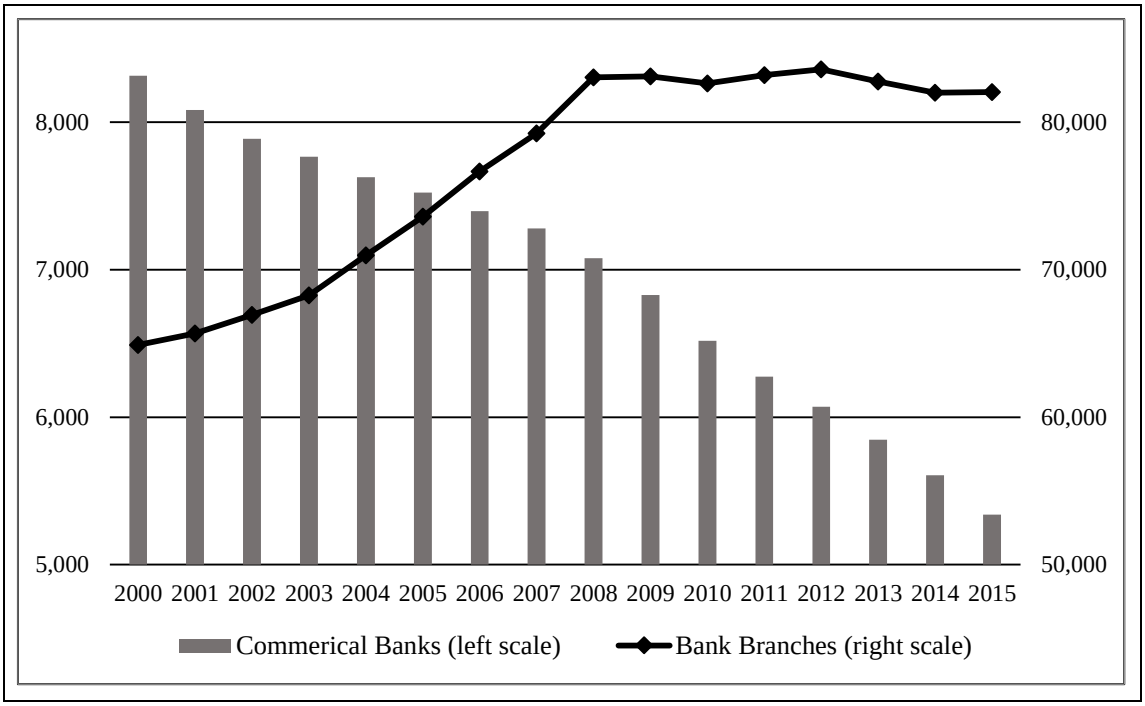
Table 2: Average number of banks, branches, and offices.

Period	Average number of banks	Average number of branches	Average number of offices
1930s	13873	2770	16644
1940s	13368	3891	17259
1950s	13295	6923	20219
1960s	13371	15324	28694
1970s	14102	29157	43259
1980s	14047	43266	57313
1990s	10313	56657	66970
2000s	7578	73241	80819
2010s	5943	82706	88649

The period of the 1930s covers the year from 1934 to 1939.The period of the 2010s covers the years from 2010 to 2015.
Source: Federal Deposit Insurance Corporation, Quarterly Banking Profile

One of the main reasons for a relatively higher number of banks before the period of the 1980s was the regulatory environment that did not allow the interstate banking and branching. Another reason was the payments' system that is directly related to the technological progress. Before the development of electronic payment systems (e.g., automated teller machine, credit card networks, and internet banking) in the US, the widely used method was paper checks that need safe and convenient physical location of the depository institution to complete the transaction. In addition to the regulatory environment and technological abilities, the immature structures of mutual funds and modern mortgage banking were also the reasons of the extensive market domination of depository institutions in the 1970s; households were using saving accounts and time deposit accounts that were provided by depository institutions as investment instruments (DeYoung, 2012). For the period of 2000 and 2015, as shown in Chart 1, the average number of banks is 6,965; the number of banks steadily declined from 8,315 banks to 5,340 banks. On the other hand, the average number of branches and offices provide an upward trend in the same period. The possible reasons for an increasing trend in the number of branches and offices are the regulations that allow interstate banking and interstate branching after the 1980s

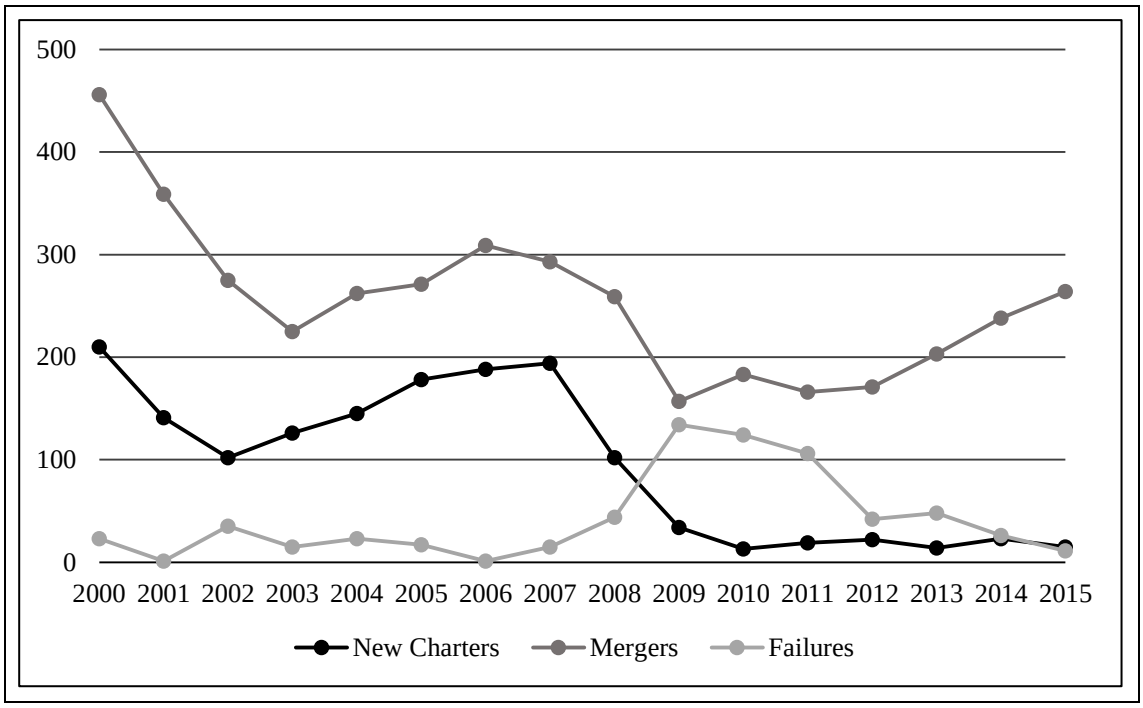
Chart 1: Number of commercial banks and commercial bank branch offices



Source: Federal Deposit Insurance Corporation

As a result of the decrease in the number of banks, the new charters declined in the late 1970s. The elimination of the regulations, which restrict the interstate banking, triggered the rapid growth of banks by acquiring other banks. On the other hand, Berger et al. (2004) show that the start-up of new banks in local markets occurs after the acquisition of established banks. Before the period of the 2000s, the total number of mergers and acquisitions was 9,816 for three decades and had an effect on reshaping the structure of the market. Additionally, bank failures also declined the number of banks at specific time periods. The total number of bank failures was 1,431 in total during the 1980s and 1990s. For the period of 2000 and 2015, as shown in Chart 2, the effect of the financial crisis is visible between 2007 and 2010; the number of bank failures increased when the numbers of mergers and new charters declined.

Chart 2: Number of commercial bank change due to mergers, failures, and new entry



Source: Federal Deposit Insurance Corporation

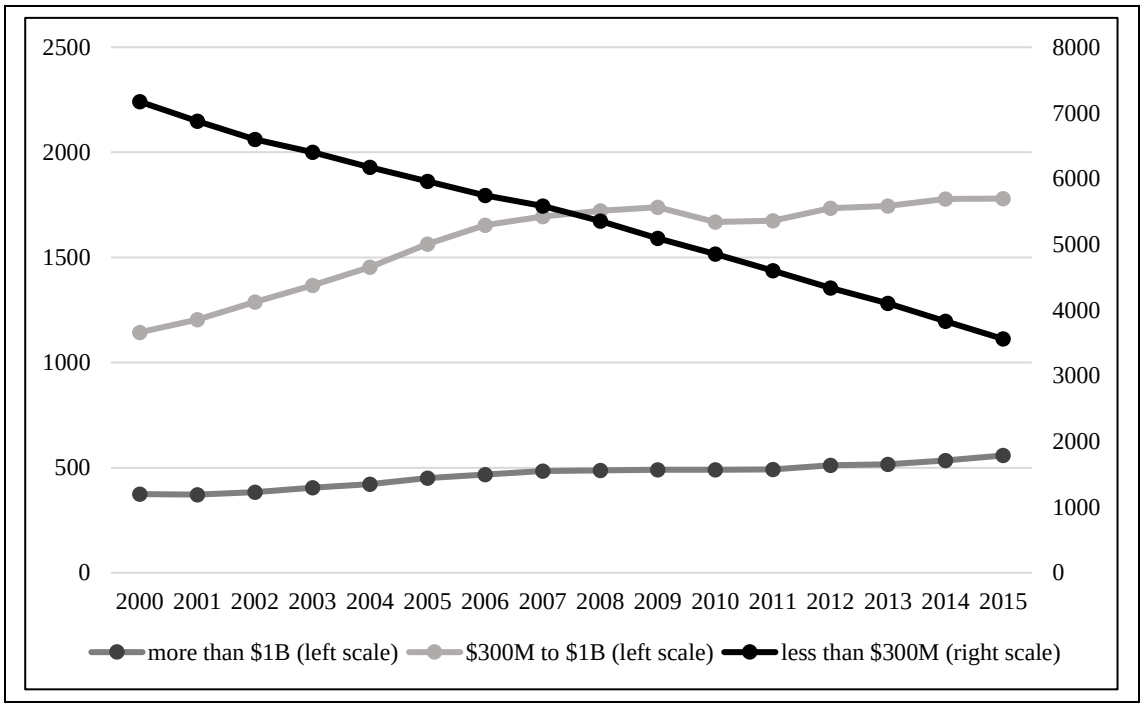
2.2. Change in distribution of banks by size

The size distribution of banks has been changed as well as the number of banks in the US. It is clear that bank size has an effect on activities and performance of banks. Small size banks that concentrate on retail banking by providing loans and issuing deposits to small businesses and individual consumers hold fewer off-balance-sheet assets and liabilities. On the other hand, wholesale banking is the concentration of large banks when they still have intention on retail banking. Large banks have easy access to capital markets and purchased funds compared to small banks. Thus they can operate with lower amounts of equity capital and fewer core deposits.

For the period of 2000 and 2015, as shown in Chart 3, the number of banks with less than $300 million total assets provides a downward sloping trend. Most of the failures and acquisitions of banks occurred in this asset size. Additionally, the completed growth process of small banks and their upward move from this group also declined the number of banks with less than $300 million total assets. On the other hand, the number of banks with total assets between $300 million and $1 billion total assets had an upward trend in

given period. Also, the number of banks with more than $1 billion total assets remained stable. These results are in line with the literature that argues the scale economies exhausted by small banks (Berger and Mester, 1997; Clark, 1988; Evanoff and Israilevich, 1991; Mester, 1987).

Chart 3: Changing in commercial bank distribution by size



Source: Federal Reserve Statistical Release

2.3. Asset, loan, and deposit structure of banks

The balance sheet of a bank is essential to understand the intermediation role of the banks and the transformation process of funds from deposits to loans. The liability side of the balance sheet of a bank constitutes the large proportion of funds deposited from costumers. On the other hand, the asset side of the balance sheet organises loans which denote the large portion. Table 3 provides total assets, loans and leases, and deposits in $ billion for the period of 2000 and 2015.[1]

The average total assets of US banks are more than $10,000 billion between 2000 and 2015. There is an upward trend in total assets; the only exception was 3.76 percent decline

[1] The brief descriptions of total assets, total loans and leases, and deposits are provided in Appendix A.

in 2009. Net loans and leases is 54 percent of the total assets at the end of 2015. The second proportion belongs to investment securities with 21 percent. Cash and due from depositors is 11 percent of the total assets; other earning assets, all other assets, intangible assets, and bank premises and equipment are the other main items on the asset side of bank balance sheet, respectively.[2]

The average total loans and leases is $5,996 billion from 2000 to 2015. There is an upward trend for the given period. Secured by real estate item of the balance sheet is 49 percent of the total loans and leases. The second biggest item in the distribution of total loans and leases is commercial and industrial loans by 22 percent. The third group is loans to individuals by 17 percent. Other loans, loans to state & political subdivisions, agricultural production, loans to depository institutions are also the items of the total loans and leases.[3]

The average deposits is $6,385 billion for the period of 2000 and 2015. The increase in deposits is steady. Savings deposits is 71 percent of the deposits, as of 31st of December 2015. Demand deposits (time deposits) is 15 (14) percent of the deposits for the same period.[4]

Table 3: Total assets, total loans and leases, and deposits in $ billion, 2000-2015

Year	Total Assets	Total Loans and Leases	Total Deposits
2000	6,245	3,820	3,473
2001	6,569	3,895	3,762
2002	7,077	4,156	4,032
2003	7,602	4,429	4,288
2004	8,414	4,904	4,727
2005	9,040	5,380	5,153
2006	10,090	5,981	5,538
2007	11,176	6,626	5,807
2008	12,309	6,838	6,543
2009	11,846	6,500	6,803
2010	12,066	6,595	6,965
2011	12,640	6,710	7,826
2012	13,391	7,048	8,644
2013	13,670	7,246	8,988
2014	14,475	7,631	9,543
2015	14,893	8,170	10,065

Source: Federal Deposit Insurance Corporation, Quarterly Banking Profile

[2] Chart 4 in Appendix A provides the distribution of total assets, as of 31st of December 2015.
[3] Chart 5 in Appendix A provides the distribution of total loans and leases, as of 31st of December 2015.
[4] Chart 6 in Appendix A provides the distribution of deposits, as of 31st of December 2015.

2.4. Banking industry performance

The selected banking performance indicators are provided in Table 4. The literature consists of wide variety of performance indicators. In this study, the selected ones that are related to profitability, loan structure, and growth are gathered from quarterly industry reports of FDIC for the period of 2000 and 2015.

The banking industry recorded a significant growth when the overall US economy grew in the 1990s. The earnings of the US commercial banks exceeded the limit of $70 billion at the beginning of the 2000s. Return on assets (ROA) was 1.15 and more 65 percent of the banks operated with ROA of 1 percent or higher in 2000. On the other hand, provision for loan losses reached the level of $9.5 billion, which was $3.4 billion greater than the previous year in 2000. In 2003, the net income rose to $106.3 billion level after the net income was $74.3 billion in 2001. At the same year, ROA and return on equity (ROE) reached the high of 1.41 percent and 15.53 percent, respectively. The reasons for this level were the highest non-interest income level of $18.9 billion and the lowest level of loan loss provision level of $14.2 billion between 2000 and 2015. In 2004 and 2005, continued increase in consumer and commercial loan demand supported the growth in earnings.

Interest rate cuts by the Federal Reserve, which makes borrowing cheaper and home purchasing affordable, also supported the strong performance of banks in the early 2000s. Additionally, constructing innovative financial derivatives (e.g., credit derivatives and mortgage-backed securities) allowed banks to export their credit risks from their bodies to financial markets. Non-current loans to total assets ratio, which denotes the loans with not accrued interest because of the problems of the borrowers, declined to the lowest level at the end of the first half of the 2000s. At the same time, net charge-offs to loans ratio that points out the actual losses on loans and leases reached the lowest level. As the highest level, asset growth rate was 11.62 percent in 2006.

Bank performance declined in the second half of the 2000s when the US economy faced the most catastrophic financial crisis after the Great Depression and recession period (Saunders and Cornett, 2012). Net income of banks decline to $105.5 billion level in 2007

(a decline of $39.8 billion); this denotes a 27.4 percent decline in income compared to previous year. Only 49.2 percent of the institutions reported increased earnings. In other words, after a 23-year period, more than half of the institutions did not announce positive earnings in 2007. Industry ROA and ROE were 0.38 percent and 3.76 percent in the same year, respectively. Additionally, non-current loans to total assets and net charge-offs to loans ratios were doubled compared to previous year in 2007. On the other hand, the slight decline was detected in asset growth rate in the same year. The adverse effects of the financial crisis became severe in 2008. Net income in 2008 was $10.2 billion and declined by 89.8 percent ($89.8 billion) compared to net income in 2007; this is the lowest level of income for last three decades. Negative ROA and ROE were recorded in 2008; -0.96 percent and -10.14 percent, respectively. In this year, almost 35 percent of the institutions were reported as unprofitable, and 65 percent of the institutions reported lower income compared to income level in 2007. The total non-interest income level of banks declined by $25.6 billion. The decline was the total of one-year trading loss ($1.8 billion), securitization income ($5.8 billion), sales of loans ($6.6 billion), and value drop in foreclosed properties and other assets ($11 billion). In 2008, noncurrent loans to total assets and net charge-offs to loans ratios were 2.95 percent and 1.94 percent, respectively. Net charge-offs on loans and leases increased by 132 percent in the same year; the level was $38 billion in 2008.

By the second half of 2009, the economy started to recover and affected the bank performance positively. Despite relatively higher loan loss provisions, revenues tended to increase compared to previous year. Almost 65 percent of the institutions started to report positive earnings after the crisis period. Non-current loans to total assets and net charge-offs to loans ratios reached the highest levels in the period of 2000 and 2015; 5.53 percent and 3.02 percent, respectively. In the process, both of them were declined and reached the lowest level in 2015; 1.54 percent and 0.47 percent, respectively. A similar recovery detected in ROA and ROE. In 2009, ROA and ROE were positive and 0.01 percent and 0.09 percent, respectively. After 2009, ROA and ROE reached the highest levels in 2013; 1.1 percent and 9.92 percent, respectively. After the negative asset growth rate in 2009, asset growth rate was relatively stable, and the average asset growth rate was 3.9 percent in the last five years.

Table 4: Selected performance indicators for commercial banks, 2000-2015

Year	Return on Assets (%)	Return on Equity (%)	Noncurrent loans to total assets (%)	Net charge-offs to loans (%)	Asset growth rate (%)
2000	1.15	13.44	1.12	0.93	4.38
2001	1.13	12.57	1.41	1.31	5.19
2002	1.23	13.34	1.46	1.1	7.73
2003	1.41	15.53	1.19	0.91	7.42
2004	1.28	12.8	0.86	0.68	10.68
2005	1.24	12.26	0.75	0.66	7.44
2006	1.25	12.18	0.8	0.48	11.62
2007	0.38	3.76	1.3	0.86	10.76
2008	-0.96	-10.14	2.95	1.94	10.14
2009	0.01	0.09	5.53	3.02	-3.76
2010	0.64	5.78	4.96	2.4	1.86
2011	0.77	6.92	4.14	1.42	4.76
2012	0.96	8.54	3.62	0.99	5.94
2013	1.1	9.92	2.64	0.59	2.08
2014	0.93	8.34	1.95	0.48	5.89
2015	1.03	9.13	1.54	0.47	2.89

Source: Federal Deposit Insurance Corporation, Quarterly Banking Profile

3. A century of the banking industry in the US

After the great depression, the early stage of the banking system was reshaped in the 1930s, and significant outcomes of this change became vital (Neal and White, 2012). One of the first outcomes was the Glass-Steagall Act (also known as Banking Act of 1933) that separated commercial and investment banking. The split of JP Morgan is the clear example of regulation of separating commercial and investment banking on the Banking Act of 1993; JP Morgan for commercial banking and Morgan Stanley for investment banking (Kroszner and Rajan, 1994). With this, commercial banks were prohibited from underwriting and dealing securities in any capacity (e.g. prohibition from affiliation with firms that underwrite and deal). The main purpose of this regulation is to keep the bank as an important intermediation tool that provides credit for the vast majority of individuals and businesses within the economy. In the process, the restrictions of the Act were criticised regarding risk (Crockett, 2003; Kroszner and Rajan, 1994; White, 1986). The main debate on the act was the adverse effect on the industry that became riskier rather than safer in the second half of the 1990s (Cuaresma, 2002). In 1999, the Act was repealed, and the separation of commercial and investment banking was eliminated by the establishment of the Gramm-Leach-Bliley Act.

In the US, the Banking Act of 1935 is another early example of banking regulation in the last century. The distinct parts of the Act that amended the Federal Reserve Act defined the structure and function of Federal Reserve System; shifted power from the regional reserve banks to Board based in DC, increased the independence of the Board of Governors, and provided additional authority over discount rates in each district (Bernanke, 2013; Neale and Peterson, 2005).

On the other hand, from the 1930s to 1970s, federal and state-level regulations protected commercial banks from price, product, and geographical competition (Chong, 1991). Interstate branch banking was forbidden by the McFadden Act of 1927 with the purpose of preventing the commercial banks from geographical competition. Between 1980 and 1994, thirty-two states liberalised geographic restrictions to allow interstate banking and branching. Another progress in the banking industry is the access to the public safety net that was open to insolvent banks before the 1930s. The legal source of public safety net access is the related passages of the Federal Deposit Insurance Act of 1933. The negative consequence of the access of public safety net is the opaqueness of the banking industry that comes from greater risk taking (Calomiris, 1999). To prevent financial instability (the result of competition for deposits), the prohibition of paying interest on demand deposits is the third outcome of the Banking Act of 1933.

The technological change and the rapidly evolving financial markets affected the strict regulatory regime in the 1980s, and the components of the old regime were eliminated quickly. The household savings escaped from the intermediation structure of banks, and diversified non-bank investments forced the Federal Reserve to eliminate interest rate restrictions (Cho, 1986). The Depository Institutions Deregulation and Monetary Control Act of 1980 and the Garn-St.Germain Depository Institutions Act of 1982 allowed authorised banks and thrifts to offer money market deposit accounts that have no interest rate ceiling to give the banks a strategic advantage in the competition with non-bank investment instruments (Carow, 2001). In an empirical study, Millon-Cornett and Tehranian (1989) show that the Depository Institutions Deregulation and Monetary Control Act produced a positive abnormal return of stocks of the major commercial banks. In 1989, the Federal Reserve decided to relax the Glass-Steagall Act to allow the commercial banks to underwrite corporate securities. In the 1990s, the acts that result in

deregulation were the notable events in the banking industry. The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 relaxed the regulations on geographical restrictions and allowed state-chartered banking by repealing the McFadden Act's related parts; the only exception was the acquisition of banks with the national deposit market share greater than 10 percent. Also, the Gramm-Leach-Bliley Act of 1999 repealed the restriction on separation of commercial and investment banking of the Glass-Steagall Act. Additionally, one of the purposes of this Act was to control the private information of individuals that is collected by financial institutions. The findings of Mamun et al.'s (2005) work that investigates the effect of Gramm-Leach-Bliley Act point out the welfare gain of individuals from this law. The findings also show that the expose of systematic risk for different categories of banks decreased after the passage of this law.

The first decade of the new century recorded a financial crisis that was the severe one after the Great Depression and an economic recession period. The collapse of the major financial institutions was one of the consequences of the financial crisis. Reinhart and Rogoff (2009) provide the three characteristics of the financial crises. The first characteristic of the financial crises is the deep market collapses. The measure of the severe market collapse is the comparison of the real housing and equity prices. By measuring the effect of financial crises, real housing prices decline 35 percent in six years after the crises. On the other hand, the average equity prices decline 55 percent in three and a half years. The second characteristic of the financial crises is the declined employment and output. The unemployment rate increases by seven percentage points in four years aftermath of financial crises. Also, the output declines 9 percent in two years. The third characteristic of the financial crises is observed at government debt, which tends to explode after the financial crises. Interestingly, the increase in the public debt is not the result of the cost of bailing out and banking systems' recapitalization. The main reasons for the recorded increase are the decline in tax revenues and the failure of fiscal policies. In addition to these characteristics of the financial crises, the liquidity shortfall of the US banking system increased the damage of the crisis as well as the decline in economic activity that triggered a global economic recession.

As a reaction to the financial crisis, the Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010 to reorganise financial markets (Acharya

et al., 2010). The main purpose of the act is to decline various risks in the US financial system by establishing new government agencies to monitor the banking system. To limit the damage of large firms, which are the subjects of "too big to fail" concept, in the economy, the Financial Stability Oversight Council and Orderly Liquidation Authority are employed to monitor the liquidations and provide support by using Orderly Liquidation Fund. The council has the authority to split the large banks to decline their default risks or force them to increase their reserve requirements. For the insurance companies, the "too big to fail" concept is monitored by the Federal Insurance Office. In order to control the harmful mortgage lending, govern consumer lending (includes credit and debit cards), and inform consumers to understand the terms and conditions of lending paperwork that they face, the Consumer Financial Protection Bureau is employed; the Bureau has authority to limit the excessive earnings of mortgage brokers from higher fees and higher interest rates.

The Volker Rule, which is one of the key components of the Dodd-Frank, separates investment and commercial banking activities; the involvement of banks with risky businesses (hedge funds and private equity firms) are not allowed. Additionally, the rule provides restrictions on bank trading; the speculative trading of banks is limited and proprietary trading, which refers to the banks' investments to own direct gain on behalf of their clients rather than gain from commission dollars, is eliminated. In other words, the era that started with the Gramm-Leach-Bliley Act of 1999 has been finished by clearly defining roles of financial institutions and separating risky businesses from regular banking activities.

The experiences that were gained from the financial crisis lead the lawmakers be more cautious. As a result, highly regulated financial markets and distinct borders for the transactions of banks are targeted by the Dodd-Frank Act. On the other hand, there are some criticisms of the Act (Coffee, 2011). Profit making ability of a financial firm is declined by limiting the risk and the competitiveness of the US firms declines in foreign markets. The lawmakers select the choice of the safer market at price of illiquid market conditions. Also, financial institutions face higher reserve requirements that force to hold a greater percentage of their assets in cash. This requirement simultaneously declines the amount they can invest in marketable securities and affects bond market negatively. On

the other hand, the strict regulations could harm smaller financial institutions that have no effect on the recession. Overall, the critics suppose that the Dodd-Frank Act could be the reason of negatively affected economic growth and its adverse consequences on the wages and employment rates.

4. What makes banks' corporate governance special?

There are three issues can be pointed out to determine the research ground of corporate governance. The first problem is the principal-agent problem that denotes the conflict of interest between shareholders and dominant executives. The second issue is the cost of monitoring the management by individual shareholders. The third issue is the conflicts in blockholding (Becht et al., 2011). The corporate governance of financial institutions deals with these three issues. In addition to them, the nature of the business creates externalities in traditional corporate governance mechanisms. Financial institutions play a crucial role to promote economic growth to allocate the capital efficiency (Levine, 2005). On the other hand, financial institutions can take risk quickly than other institutions. With this nature, the opaqueness of the business does not allow the shareholders to detect the risk as quickly as possible (Diamond, 1991; Diamond, 1989; Morgan, 2002). Also, the number of instruments, which are employed in the market, and the short in the supply of specialists to monitor the trading activities of financial institutions are another difficulties that investors face.

There are four aspects are defined to point out the differences of banks: high leverage, diffused debtholders, large creditors, and distinct regulations (Laeven, 2013). The high average leverage ratio in banks is the result of maturity mismatches in the economy. The intermediation role of banks allows them to work with a high leverage ratio that might be severe for the non-financial firms. The majority of bank debts are transformed into bank deposits that are taken from a large number of depositors. As large creditors, banks use these deposits to support the economic growth. Finally, banks are highly regulated to decline the probability of failure to keep the system safe and sound.

Board of directors is the mechanism of corporate governance to control managers and ensure that the firm is run on behalf of shareholders' interests. There are two roles are

discussed in the literature: monitoring and advising functions of the board of directors. In addition to these functions, the features of the board structure (identifiers of good corporate governance) also discussed at country and international level; these features are larger board size, board meeting attendance, board tenure, board independence, and chief executive officer (CEO) duality.

Several studies report that bank board size that refers to the number of members on board is greater than non-financial firm board size. By comparing the largest 100 banks and largest 100 non-financial firms in the US, Booth et al. (2002) show that boards of banks are greater than boards of other firms in 1999. In addition to the greater board size, bank board structure consists of more outside members. The findings of Adams and Mehran's (2003) work show that bank holding companies have larger boards with more outside managers than non-financial firms have. In a recent study, Adams (2012) finds that bank boards are larger than boards of non-financial firms by using the sample of S&P500 firms for the period of 1996 and 2007. The possible reason for larger bank board is related to the complexity of the business (Adams and Mehran, 2003). On the other hand, the recent studies show the downward trend in the bank board size. The findings of Adams and Mehran's (2012) work is in line with Ferreira et al.'s (2010) work and show that the average US bank board became smaller over time.

The board members are supposed to attend board meeting regularly in order obtain more information about the firm. Additionally, active participation in the board meetings of members might increase the efficiency of the monitoring function of the boards. On the other hand, some thoughts advocate the idea that larger board size increases the free-rider problem on boards by declining the attendance of members of the board. The findings of Adams and Ferreira's (2012) work shows that bank boards have severe attendance issues compared to non-financial firm boards and bank board size is positively and significantly related to the number of attendance of members. In addition to the connection between board size and board attendance, the busyness of board members that denote the number of memberships on other boards is also studied in the literature. Despite the fact that sitting on more than one board becomes distracting for board members, the results of the empirical researches show that sitting on more than one board is related to use the

expertise of board members and increases the monitoring efficiency (Adams, 2010; Grove et al., 2011; Oshry et al., 2010).

The complexity of the structure of institutions and opaqueness of the industry make the expertise essential on bank boards (Mehran et al., 2011). The findings of the studies that investigate the relationship between the expertise of bank board members and bank performance are mixed (Aebi et al., 2012; Andres and Vallelado, 2008; Erkens et al., 2012). In a recent study, Minton et al. (2014) assess the downward trend at outside board members who have no financial expertise in the banking industry.

Independence of board members that denotes to be an outsider, who has no personal, family, and financial connection with the management of the firm, is one of the components of the corporate governance literature discussed. The main purpose of boards is to solve the principal-agent problem by employing board members who act on behalf of the shareholders to break the information advantage of executive managers. The study of Fama and Jensen (1983) advocates the functionality of board independence by using the psychological and sociological reasons; independent board members seek to protect their reputation in the market when they perform their advising and monitoring roles on boards. Pathan (2009) provides a similar argument with Fama and Jensen (1983) in the banking industry by pointing out the high concerns of independent board members on their reputation in the banking industry. On the other hand, Adams and Ferreira (2007) draw a theoretical concept to show that more board independence declines the information use of the board as well as the information production of board members to the shareholders that they represent. The broken information chain from management to shareholders hurts the functionality of the boards. The findings of Harris and Raviv's (2008) study is in line with the idea that board independence has drawbacks regarding agency costs compared to the advantages of board independence in the banking industry. By focusing on the US sample, Adams (2010) points out that there are fewer independent board members on bank boards compared to the boards of non-financial firms.

Separation of the roles of the CEO and the chairman of the board is another corporate governance mechanism to deal with the principal-agent problem. The CEO duality that refers to the CEO who also has a seat on the board as chairman has disadvantages on (i)

monitoring function of the board and (ii) independence of the board (Jensen, 1993; Lasfer, 2006). By using the sample of UK insurance firms, the findings of Hardwick et al.'s (2011) work point out that CEO duality creates restrictions on information flow through the board. On the other hand, the studies that argue the advantages the combined role of the CEO state that CEO duality leads the firms to reach their targets by reducing conflict of interest among executive managers and board members and improves the performance (Anderson and Anthony, 1986). The literature of CEO duality in financial firms provides mixed results. Grove et al. (2011) show that CEO duality has an adverse effect on bank performance and declines loan quality. On the other hand, Simpson and Gleason (1999) indicate that there is a negative and significant relationship between the probability of financial distress and CEO duality in the banking industry. Additionally, Pathan (2009) finds that CEO duality declines bank risk across all bank risk measures he employs.

4.1. Bank corporate governance, risk taking and regulation

Regulation and deregulation processes in US financial markets create a dynamic environment (Stiroh and Strahan, 2003). In this, the corporate governance structure and the factors that affect "good corporate governance" become essential to meet the needs of the market. Strict regulations were applied in the period from the Great Depression to end of the twentieth century. One of the most common applications of the regulations is the separation of commercial and investment banking. In the next, from the beginning of the new century to the end of the financial crisis in the second half of the 2000s was the period of deregulation. The elimination of the separation changed the structure of the financial markets. Especially, banks were involved in the businesses that were relatively riskier than traditional banking activities. Then, the process that has started with the Dodd-Frank Act is the start whistle of the regulation period. The deregulation periods make the risk management and good corporate governance practices of banks essential to establish the sound and safety of the intra-bank and inter-bank structures.

4.1.1. Risk taking and regulation

It is identified that bank risk taking behaviour has a significant effect on the financial system; broadly, economic fragility depends on this risk taking behaviour (Bernanke,

1983; Calomiris and Mason, 2003). At individual bank level, the purpose of the regulation is to reduce the risk taking incentives of shareholders and executive managers. In a theoretical study, Kim and Santomero (1988) investigate the role of regulations related to capital requirements to control the risk taking in the banking industry. The results show that "theoretically correct" risk weights can be derived under the risk-based capital plans. On the other hand, the higher capital requirements might lead the shareholders to select riskier investment portfolios to increase their wealth (Koehn and Santomero, 1980).

The literature that focuses on the relationship between bank regulation and risk taking provides mixed results in cross-country studies. By using the World Bank survey data in 107 countries, Barth et al. (2004) investigate different dimensions of the relationship between regulatory and supervisory practices and development in the banking sector. They investigate (i) the regulatory restrictions on bank activities, (ii) entry regulations of local and foreign banks, (iii) capital adequacy regulations, (iv) deposit insurance structure, (v) the source of supervisory power and independence, (vi) loan structure and diversification, (vii) regulations for information disclosure and bank monitoring, and (viii) government ownership. The findings suggest that regulations that promote information disclosure with less government ownership, higher independent auditing increase the performance of the banks, simultaneously decline risk in the banking sector. On the other hand, in a cross-country study, González (2005) points out the negative relationship between strict regulatory environment and charter value that indicates incentive to follow risky policies. From a different perspective, Klomp and Haan (2012) take the risk level of banks into consideration and measure the effect of bank regulation on risk taking by employing a cross-country data of 200 banks from 21 OECD countries. The findings confirm that the effect of bank regulation differentiates across banks at different risk levels; although bank regulation affects the risks of high-risk banks, risks of low-risk banks are not affected by bank regulation.

Close to the concept of risk taking, credit ratings are also used in the investigation of the effects of regulations. By using World Bank survey data on 857 banks from 71 countries, Pasiouras et al. (2006) examine the effect of bank regulations and bank characteristics on individual bank ratings. They measure the regulations by using entry requirements and restrictions, guideline for liquidity that provide details for asset diversification, official

disciplinary power that denotes regulations to protect shareholder rights, the presence of deposit insurance structure, capital requirements that indicate higher ratings of banks in the markets with lower capital requirements, and bank activity restrictions that refer to separation of business activities (e.g., investment banking, mutual and pension funds, real estate activities, etc.). The findings show that the aforementioned regulatory measures have a significant effect on bank ratings. The results of Demirgüç-Kunt et al.'s (2008) work is in line with the results of Pasiouras et al.'s (2006) work. They assess the bank regulation by using Basel Core Principles and find out that fully comply with it provide more favourable Moody's financial strength ratings.

4.1.2. Corporate governance and regulation

The principal-agent problem that is a conflict of interest between the principal and agent is the cornerstone of the corporate governance research. Principally, the outsiders (shareholders) are not perfectly able to monitor the insiders (executive managers), who have information advantage on the policy implications of the firms (Jensen and Meckling, 1976). Under this condition, a mechanism is needed to prevent the information advantage of insiders. In addition to the corporate governance mechanisms, legal authorities also restrict banks in their ownership structure, competition, and transactions in the market.

The concentrated ownership structure is a corporate governance mechanism to deal with the principal-agent problem by increasing the efficiency of monitoring and the free-rider problem by declining the monitoring costs of shareholders. On the other hand, the concentrated ownership might negatively affect the risk taking behaviour of banks (Beltratti and Stulz, 2012; Erkens et al., 2012). To detect the effect of concentrated ownership on risk taking of banks, Laeven and Levine (2009) conduct a study by employing Z-score as risk variable. The findings without controlling regulations show that concentrated ownership produces higher Z-score; on the other hand, by controlling shareholder protection regulations, the effect of ownership concentration on risk taking mitigates. The regulation might be applied by limiting the maximum ownership percentage or restricting the trade of bank stock to a group defined investors or all investors temporarily or permanently. Broadly, the purpose of regulation on bank ownership structure is to control the power of groups or people in the economy.

Restrictions on ownership concentration in banks and deciding who can own banks shape the corporate control and the structure of competition in the market. In addition to the limitation on ownership structures, legal authorities might regulate balancing liquidity, implementing interest rates and fees, branching, underwriting equity, owning shares in non-bank firms, and conducting other finance related businesses (e.g., real estate and insurance)

The legal authorities might apply implicit or explicit deposit insurance regulations to maintain safety and soundness in financial markets. One of the purposes of deposit insurance is to reduce the incentive of depositors to monitor banks. Also, another purpose of deposit insurance is to decline the banks' need on uninsured creditors. On the other hand, the lender of last resort feature of a central bank employs deposit insurance as a tool for banks to produce loans with the meagre capital-asset ratio. The point is that deposit insurance increases risk by less incentive of depositors to monitor and lower capital-asset ratio and increases the likelihood of suffering banking crises (Demirgüç-Kunt and Detragiache, 2002)

5. What is the purpose of bank regulation?

Mainly, there are six types of regulations to increase the net social benefits of banks in the economy. The first regulation type is the "safety and soundness" regulation that is exemplified in the pertinent part, the Federal Deposit Insurance Corporation Improvement Act of 1991, 12 USC Section 1831 (1991) states:

> "Each appropriate Federal banking agency shall, for all insured depository institutions, prescribe-
>
> (1) standards relating to-
>
> (A) internal controls, information systems, and internal audit systems, in accordance with section 1831m of this title;
>
> (B) loan documentation;
>
> (C) credit underwriting;
>
> (D) interest rate exposure;

(E) asset growth; and

(F) compensation, fees, and benefits, in accordance with subsection (c) of this section; and

(2) such other operational and managerial standards as the agency determines to be appropriate."

The main purpose of safety and soundness regulation is to protect depositors and creditors against the risk of any kinds of bank failure. One of the most important safety and soundness regulations of banks is the prohibition of making loans exceeding 15 percent of bank's equity capital funds to any other firm or creditor. The contribution of the owners of a bank to fund the bank operations is also a concern of the regulators. Another important safety and soundness regulation is the limitation of the production of the loan, which is more than 1.5 percent of the total assets of the bank to one firm or creditor if only 10 percent of the assets is funded by bank's equity capital funds. The purpose of this regulation is to decline credit, liquidity, and insolvency risks. One of the important safety and soundness regulations is related to the capital structure of a bank. In other words, the contribution of the owners of a bank to fund the bank operations is another concern of the regulators. The capital structure that is highly contributed by the owners provides greater protection against insolvency risk. As another regulation, deposit insurance (provision of guarantee fund) of banks is employed to establish the environment that consists of safety and soundness. The main idea behind the deposit insurance is to keep the deposits, who can withdraw their funds at first hint of trouble, in safe. In any case of bank collapse, depositors are allowed for demanding regulators their insured funds. The limits of the insurance are determined by regulators and varied by countries. The monitoring of banks is another regulatory determinant to provide necessary safety and soundness. On-site examination of the banks and regularly releasing required financial statements and reports for off-site examination of the banks are the monitoring activities of regulators.

To investigate the connection between bank supervision and safety and soundness of banks, Barth et al. (2002) employ a cross-country sample that consists of 70 countries by controlling country-level legal origins and macroeconomic conditions. The findings are helpful to reach the pleasurable justifications on (i) the number of regulators in the country, and (ii) the role of central banks. Firstly, the lower bank capital ratios and higher

liquidity risk are detected at countries with multiple supervisors. Second, the higher non-performing loans are detected in the countries that central banks are not apart from the bank supervision. With the cross-country sample of 61 countries for the period of 1980 and 1997, the findings of Demirgüç-Kunt and Detragiache's work (2002) support the strong regulation; explicit deposit insurance increases the likelihood of bank crises in the diluted institutional environment. Also, S. Mishkin (1999) argues the pros and cons of financial consolidation and suggests that the careful supervision of banks and a government safety net are employed to enhance safety and soundness in the banking system and manage the systemic risk that is the result of larger institutions' exposure. In addition to the regulations, market mechanisms are also helpful in order to maintain safety and soundness in the banking system. In an empirical research, Paroush (1995) shows that merger and acquisition (M&A) of a bank reduce the exposure of risk of a bank. The principal reason for reduced risk is the stronger capital structure and diversified portfolio of a bank after M&A. On the other hand, M&A has a similar effect on the whole market; M&A directly reduces the total risk in the system. The reason of reduced total risk is the decline in the absolute number of banks in the system.

The second motivation of the regulation is related to the intermediation role of banks in monetary policies of central banks. The money supply in the economy affects a wide variety of topics from the microeconomic level (e.g., personal loans and mortgages) to the macroeconomic level (e.g., interest rates, gross domestic product, and unemployment rate). By controlling the money supply, central banks manage the monetary policies to reach economic goals. In general, regulators require banks to hold a level of cash reserves (Australia, Canada, Hong Kong, New Zealand, Sweden, and the UK have no reserve requirement). There are two types of reserves that banks hold. One of them is the reserve that consists in the deposit balances held by banks at the central banks. The other type of reserve is the physical form of reserve in bank vaults to meet the depositors' requirements of cash withdrawals. The physical reserves of banks allow central banks, which also supply notes and coins, to control the money supply in economies.

In a theoretical study, Cecchetti and Li (2008) discuss the conflict between central bankers and bank supervisors regarding lending activities of banks and assess that central bankers have potential to avoid the conflict by adopting an interest rate strategy and

setting reserve requirements. Sellon and Weiner (1997) point out that there are two arguments on low reserve requirements. One of these arguments, the higher short-term interest rate volatility as a result of the low reserve requirement, supports the case of complicated monetary policy. The other argument claims that low reserve requirement removes the distortionary tax on depository institutions and this requirement does not contaminate monetary policy. By using a novel dataset for 52 countries in the period of 1970 and 2011, Federico et al. (2014) investigate the use of reserve requirements as a macroeconomic tool for stabilising the economy. The findings show that the central banks of 30 countries in the sample (5 developed and 25 emerging economies) use the reserve requirement as a tool of macroeconomic stabilisation. As an important interpretation, they point out that reserve requirement is a substitute for monetary policy.

The third motivation of regulating the banking industry is related the effect of financial intermediation on other sectors. The purpose of the regulation of credit allocation is to provide lending of banks on some certain sectors that are considered to be socially important (e.g., housing and farming). The loans to farming to increase the agricultural productivity and loans to small and medium-sized enterprises (SMEs) are the well-known examples of credit allocation regulations. In order to subsidise these sectors, regulators can set maximum interest rate, prices, and fees or require financial institutions to hold a minimum amount of assets in one particular sector. An obvious example of credit allocation regulation from the US is the qualified thrift lender (QTL) test that is established by the Competitive Equality Banking Act of 1987, as amended by the Economic Growth and Regulatory Paperwork Reduction Act of 1996 and requires a federal saving association to hold qualified thrift investments equal to at least 65 percent of the portfolio assets. The qualified thrift investments include education loans, credit card loans, and small business loans. Any saving institution that fails to meet the requirement of QTL is subject to certain operating restrictions.

The regulations that aim to protect customers is the fourth regulation motivation. To provide fair market conditions for every participant, especially customers, the legal authorities want to prevent discrimination at any capacity in the market. In the US context, the Community Reinvestment Act (CRA) is an example of these regulations. The

Congress passed the CRA in 1977 to meet the needs of communities. In the pertinent part, the CRA, 12 USC Section 2901 (1977) states:

(a) "The Congress find that –
    (1) regulated financial institutions are required by law to demonstrate that their deposit facilities serve the convenience and needs of the communities in which they are chartered to do business;
    (2) the convenience and needs of communities include the need for credit services as well as deposit services; and
    (3) regulated financial institutions have continuing and affirmative obligation to help meet the credit needs of the local communities in which they are chartered.
(b) It is the purpose of this chapter to require each appropriate Federal financial supervisory agency to use its authority when examining financial institutions, to encourage such institutions to help meet the credit needs of the local communities in which they are chartered consistent with the safe and sound operation of such institutions."

After 1992, financial institutions are required to disclose their CRA ratings as well as to submit reports that show the demographic information of their customers and the geographic distribution information of their clients. In addition to these ratings and reports, banks must also provide the reasons of why they granted and denied credits to their chief federal regulator.

Another example of these regulations is the Home Mortgage Disclosure Act (HMDA). The Congress enacted the HMDA in 1975. Although the substitutions and changes were applied to this Act, the main purpose of the act has stayed the same. The act employs the Federal Financial Institutions Examination Council (FFIEC) to create regional and individual institution disclosure reports to determine whether financial institutions serve the housing needs of the community and identify the discriminatory lending patterns.

The fifth motivation of the regulation is related to the entry and chartering regulations of banks. The banking industry is highly regulated in the US. The regulations mainly focus

on the entry requirements that control the direct (capital requirements and fees) and indirect (the type of individuals who can establish a bank) costs. These restrictions make the banking industry unattractive compared to other sectors for entrepreneurs. In addition to the entry requirements, regulators closely monitor the industry and each bank to allow them to charter.

The sixth motivation of the regulation is related to investor protection in the market. The main purpose of this motivation is to protect investors who directly invest in banks by buying securities or indirectly invest through mutual or pension funds managed by banks against financial market abuses (e.g., insider trading and lack of disclosure). The Securities Act of 1933 and 1934, and the Investment Company Act of 1940 are the relevant examples of US regulations that aim to protect investors; the historical trend shows that the regulatory power of institutions shifts from state-level to federal-level (Boskovic et al., 2010).

6. Bank Regulations in the US

A banking institution must be chartered at either federal or state level to accept deposits. Each state has banking and financial institution division. Table 5 summarises the chartering agencies, primary and secondary regulators of financial institutions.

At the federal level, the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC), the Board of Governors of the Federal Reserve System (The Federal Reserve) and the National Credit Union Administration (NCUA) are the main regulators of the US banking industry. Briefly, national banks are regulated by the OCC. The supervisory responsibility of federal savings and loans, federal savings banks, thrifts and thrift holding companies switched from the Office of Thrift Supervision to the OCC. The FDIC is the regulator of the insured depository institutions (state-chartered banks) that are not the members of the Federal Reserve System. The Federal Reserve is the regulator of the bank holding companies, state-chartered banks and trust

companies that are the members of the Federal Reserve System. The NCUA regulates federally chartered credit unions.[5]

Table 5: Banking institutions, their chartering agencies and primary & secondary federal regulators

Institution type	Chartering Agency	Primary federal regulator	Secondary federal regulator
Federal charter			
National bank	OCC	OCC	Federal Reserve, FDIC
Federal savings association	OCC	OCC	FDIC
Federal savings bank	OCC	OCC	FDIC
State charter			
State non-member bank	State agency	FDIC	-
State member bank	State agency	Federal Reserve	FDIC
State savings bank	State agency	FDIC	-
State savings association	State agency	FDIC	-
Foreign banks			
Foreign bank uninsured state branches and agencies	State agency	Federal Reserve	-
Foreign bank uninsured federal branches and agencies	OCC	OCC	Federal Reserve
Foreign bank commercial state-chartered lending companies	State agency	Federal Reserve	-
Foreign bank edge corporations	Federal Reserve	Federal Reserve	-
Foreign bank agreement corporations	Federal Reserve	Federal Reserve	-
Foreign bank representative offices	State agency	Federal Reserve	-

Source: Adapted from The Banking Regulation Review (2016, p. 871)

In the US, foreign banks are mainly regulated by the Federal Reserve. Additionally, other regulators take actions according to the type of charter or banking business activity of the foreign bank. In this section, the main regulatory functions and the key statistics of the OCC, FDIC, and Federal Reserve are discussed.

[5] The National Credit Union Administration (NCUA) is an independent federal agency that regulates, charters, and supervises credit unions in the US. The main duty of the NCUA is to manage the National Credit Union Share Insurance Fund, which is the insurance of the depositors of credit unions. The NCUA is governed by three board members, who are appointed by the president with the confirmation of the Senate. The president also chooses the chair of the board. The board members serve for six-year period. Additionally, the NCAU, headquartered in Alexandria, Virginia, has five regional offices. In 2015, the NCAU regulates 6206 federally insured credit unions with assets totalling more than $1.16 trillion (http:// http://www.ncua.gov/About/Pages/default.aspx).

6.1. The Office of the Comptroller of the Currency (OCC)

The Office of the Comptroller of the Currency (OCC), as an independent and non-approved bureau of the US Treasury Department, is the federal bank regulator with the power to charter national banks, federal branch or agency of foreign banks, and as of 2011, thrift companies and federal savings associations.

In pertinent part, National Bank Act, 12 USC Section 26 (1863) states:

> "Whenever a certificate is transmitted to the Comptroller of the Currency, as provided in title 62 of the Revised Statutes, and the association transmitting the same notifies the Comptroller that all of its capital stock has been duly paid in, and that such association has complied with all the provisions of title 62 of the Revised Statutes required to be complied with before an association shall be authorized to commence the business of banking, the Comptroller shall examine into the condition of such association, ascertain especially the amount of money paid in on account of its capital, the name and place of residence of each of its directors, and the amount of the capital stock of which each is the owner in good faith, and generally whether such association has complied with all the provisions of title 62 of the Revised Statutes required to entitle it to engage in the business of banking; and shall cause to be made and attested by the oaths of a majority of the directors, and by the president or cashier of the association, a statement of all the facts necessary to enable the Comptroller to determine whether the association is lawfully entitled to commence the business of banking."

In general terms, the OCC is charged to ensure that the financial institutions operate regarding safety and soundness. Another essential duty of the OCC is to ensure that financial institutions comply with laws and regulations. Additionally, the OCC provides consumer protection and makes sure that consumers have fairly access to financial services. In addition to the state-level regulation, national banks must be chartered by OCC. Under Dodd-Frank Act of 2011, the Office of Thrift Supervision (OTS), which has previously chartered and supervised federal savings and loans, federal savings banks,

thrifts and thrift holding companies, was abolished in 2011 and the power of the OTS was transferred to the OCC and other regulators.[6]

The OCC has the authority to (i) issue rules and regulations, legal interpretations of the current laws, and decisions in order to govern investments, lending and other practices, (ii) examine banks, (iii) accept and deny the applications for new charters, branches, agencies of current banks, (iv) accept or deny the requests for capital structure and other changes of banks, (v) perform supervisory actions against banks that do not comply with laws and regulations, (vi) perform supervisory actions against banks that have unsound practices, (vii) remove officers and directors, arrange agreements to change banking practices, issue chase and desist orders, issue civil money penalties after the supervisory actions.

Table 6 provides the key statistics of the OCC for the period of 2003 and 2015. The total assets of all OCC-supervised institutions are steadily increased in given period. The only exception is the financial crisis in the period; the lagged effect of the financial crisis is detected on total assets in 2011 ($9.6 trillion). The total assets of 2015 ($11.1 trillion) is still behind the total assets of 2010 and 2011 each ($11.9 trillion).

For the given period, the OCC supervises mean 67.1 percent of the US banking industry regarding total assets. Despite the lowest total assets level in 2011 ($9.6 trillion), 76 percent of the US banking institutions was supervised by the OCC. The possible reason for the highest percentage in 2011 was the merging of the OTS and transferring the OTS supervision responsibilities on thrift and thrift holding companies to the OCC. Before the merger of the OTS, the OCC was supervising 64.6 percent of the US banking institutions in average.

The average number of the OCC-supervised institutions is 1,784. The effect of the merger of the OTS is also detected on the number of the OCC-supervised institutions: the number of the OCC-supervised institutions is increased to 2,036 with 36.9 percent increase

[6] The transfer of the OTS responsibilities and power to the OCC, FDIC and Federal Reserve was effective by 21 July 2011.

compared to previous year. Before 2011, the average number of OCC-supervised institution number was 1,772; the average number after 2011 is 1,744.

For the period of 2003 and 2015, the average number of employees of the OCC is 3,308. The OCC investigates the supervised institutions regularly. In addition to the regular investigations of the institutions, the corporate crises at the beginning of the 2000s and the financial crisis led regulators to take control of the markets. Thus, the number of the OCC employees is steadily increased to satisfy the need of the industry and growing demand of the market watch.

To satisfy the same requirements mentioned in the previous paragraph, the revenue of the OCC increases in the given period (the only exception was the slight revenue decline in 2013): the average revenue of the OCC is $793.7 million. Despite the interest received on investments in US Treasury securities, the OCC's operations are funded primarily by assessments collected from the OCC-supervised institutions (97 percent of the revenue).

In addition to the regular fiscal year investigations of the OCC in US banking institutions, the OCC takes actions and starts investigations after receiving consumers' complaints. The OCC collects the number of complaints from consumers and releases this number with the number of complaints closed in the given fiscal year to measure the performance of the OCC.

For the period of 2003 and 2015, the average number of consumers' complaints opened is 54,671. The number of consumers' complaints reached the highest levels in 2010 and 2011 (80,336 and 87,000 respectively). The reason for reaching the highest numbers of the consumers' complaints in these two years might be the lagged effect of the financial crisis. On the other hand, another possible interpretation of the OCC performance on the consumers' complaints and the effectiveness of the investigations can be reached with the percentages of the consumers' complaints closing before and after the years 2010 and 2011. Before the period of 2010 and 2011, the total number of consumers' complaints opened was 382,607, and the total number of consumers' complaints closed was 332,060. These numbers provide the percentage of the consumers' complaints closed (86.79 percent). On the other hand, the total number of consumers' complaints opened is

160,782, and the total number of consumers' complaints closed was 202,473. After the period of 2010 and 2011, the percentage of consumers' complaints closed was 125.93 percent. The percentage shows that the OCC closed the complaints of the period after 2011 as well as the complaints of the period of 2010 and 2011 and before.

Another performance measure of the OCC is the percentage of consumers' complaints closed within 60 calendar days of receipts. A Higher percentage of the closed complaints within 60 calendar days refers to the efficiency of the investigation process of the OCC.

For the given period, the average percentage of the closed consumers' complaints was 47 percent, and the OCC had the lowest percentages in 2009 and 2010 (8 percent and 3 percent respectively). With taking the enormously increased numbers of opened consumers' complaints into consideration, the lagged effect of the financial crisis might also be detected in the percentage of consumers' complaints closed in 2009 and 2010.

Table 6: Key statistics of the OCC.

In this table, all dollar amounts are in billion USD. Column 1 denotes the total assets of all OCC-supervised institutions. Column 2 denotes the percentage of all OCC-supervised institutions in total US banking assets. Column 3 denotes the number of all OCC-supervised institutions. Column 4 denotes the number of employees. Column 5 denotes the revenue of OCC. Column 6 denotes the percentage of assessments in revenue. Column 7 denotes the number of consumer complaints opened. Column 8 denotes the number consumer complaints closed or referred. Column 9 denotes the percentage of consumer complaints closed within 60 calendar days of receipt.

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2003	4600	56	2150	2800	0.436	98	75114	69044	87
2004	4760	57	1934	2727	0.477	99	68026	68104	74
2005	5800	67	1933	2802	0.519	97	73519	72203	72
2006	6400	67	1750	3000	0.634	97	31827	32945	36
2007	7062	68	1677	3066	0.671	95.8	33655	26245	18
2008	8300	62	1678	3122	0.736	96.1	41656	30986	12
2009	11900	69	1565	3104	0.775	97	58810	32533	8
2010	11900	71	1487	3101	0.792	97	80336	79660	3
2011	9600	76	2036	3717	0.877	97	87000	92000	44
2012	10100	71	1971	3823	1.23	96.4	66161	59130	56
2013	10400	69	1808	3823	1.02	97	44370	44274	71
2014	10900	71	1663	3954	1.06	97	27783	73806	51
2015	11100	68.3	1535	3959	1.091	97.2	22468	25263	78

Source: OCC data

In sum, the OCC staff of examiners, headquartered in Washington D.C. conducts reviews of banks in four district offices and London office. Appendix B, Table 10 provides the districts and city offices of the OCC in 2015. They examine loan and investment

portfolios, capital, earnings, liquidity, fund management of all banks. Additionally, they evaluate the managerial ability of the bank to identify and control risk.

The organisational structure of the OCC provides integrity, collaboration and independence rooted from National Bank Act of 1863. The president, with the advice and consent of the US Senate, appoints the Comptroller to head of the OCC for five years. The Comptroller is the board member of the Federal Deposit Insurance Corporation and voting member of the Financial Stability Oversight Council and the Federal Financial Institutions Examination Council.

6.2. The Federal Deposit Insurance Corporation (FDIC)

To maintain public confidence and stability in the national banking system, Congress created the Federal Deposits Insurance Corporation (FDIC) in the Banking Act of 1933. In the pertinent part of the Federal Deposit Insurance Act, Section 1, 12 USC Section 1811(a) (1933) states:

> "(a) Establishment of Corporation
>
> There is hereby established a Federal Deposit Insurance Corporation (hereinafter referred to as the "Corporation") which shall insure, as hereinafter provided, the deposits of all banks and savings associations which are entitled to the benefits of insurance under this chapter, and which shall have the powers hereinafter granted.
>
> (b) Asset Disposition Division
>
> (1) Establishment
>
> The Corporation shall have a separate division of asset disposition.
>
> (2) Management
>
> The division of asset disposition shall have an administrator who shall be appointed by the Board of Directors.

(3) Responsibilities of Division

The division of asset disposition shall carry out all of the responsibilities of the Corporation under this chapter relating to the liquidation of insured depository institutions and the disposition of assets of such institutions."

In addition to the establishment of the FDIC, the Banking Act of 1933 provided a federal government guarantee of deposits in US depository institutions the FDIC manages the Deposit Insurance Fund, which is funded by insured depository institutions, and provides the depositors with access to their insured funds when the insured depository institution fails.

The FDIC is also the regulator of primary federally insured state-chartered banks that are not the member of the Federal Reserve System. In cooperation with state level banking agencies, the FDIC provides safety and soundness of operations and promotes consumer protection against severe depository institutions' activities, creates the environment of fair lending. On the other hand, the FDIC has backup supervisory responsibility for other insured deposit institutions, which are primarily regulated by the Federal Reserve and the OCC. With these functions, the FDIC is the primary federal regulator in the US.

The FDIC is the main receiver of the failed insured depository institutions and response to set up resolution plans with the Federal Reserve. This is a legal requirement for the FDIC rooted from Dodd-Frank Wall Street Reform and Consumer Protection Act.

The governing body of the FDIC is the board of directors of the FDIC, which is composed of five members. Three members of the board of directors, who serve five-year period, are appointed by the president with the advice and consent of the US Senate. Two members of the board are nominated by the OCC and the Consumer Financial Protection Bureau.

The FDIC does not charter banking institutions. It supervises any bank failures and regulates certain bank activities and operations to protect and preserve federal deposit insurance fund. The bank examination program of the FDIC, which is an important

performance measure, is the core of its supervisory program. The FDIC measures an institution's compliance with applicable laws and regulations, management practices and policies, and operation condition through risk management (to test the safety and soundness), consumer compliance and the Community Reinvestment Act.[7] Table 7 provides the FDIC examinations between 2000 and 2015.

For the given period, the average number of risk management examinations of institutions is 2,426. In these examinations, the highest number of examinations is conducted for the state non-member banks (the average number of risk management examination of state non-member banks is 2,201). The risk management examinations of savings banks, state member banks, saving associations and national banks show relatively small samples (the average number of risk management examinations of these institutions are 218, 2.43, 0.81, and 3.75, respectively). To measure an institution's compliance with applicable laws and regulations, the FDIC conducts all required compliance and CRA examinations and substantially meets its internally recognised time standards for the issuance of final examination reports and enforcement actions. If violations are identified, the FDIC completes follow-up visits and implement appropriate enforcement actions in accordance with FDIC policy. In the given period, the FDIC conducts 1,863 examinations of CRA/Compliance examinations in average. The speciality examinations of the FDIC consist of the examination of trust departments, information technology & operations and Bank Secrecy Act compliance (the number of examination of Bank Secrecy Act compliance can be reached after 2011). For the examinations of trust departments and information technology & operations, the FDIC performs a number of examinations in each year (the average number of examination of trust departments and information technology & operations are 463 and 2,344, respectively. Briefly, the mean examination number of the FDIC is 7,827 to examine different functions of insured depository institutions.

[7] The Community Reinvestment Act (CRA) of 1977, 12 USC Section 2901, aims to encourage each insured depository institution to help meet the credit needs of communities in which operates. Additionally, the CRA requires each regulatory agency to monitor the records of the insured depository institution covered by the act.

Table 7: FDIC examinations.

In this table, Column 1 denotes the number of examination of state non-member banks. Column 2 denotes the number of examination of savings banks. Column 3 denotes the number of examination of state member banks. Column 4 denotes the number of saving associations. Column 5 denotes the number of national banks. Column 6 denotes the number of compliance/ community reinvestment act cases. Column 7 denotes the number of compliance-only cases. Column 8 denotes the number of CRA-only cases. Column 9 denotes the number of cases at trust departments. Column 10 denotes the number of cases related to information technology & operations. Column 11 denotes the number of cases related to the Bank Secrecy Act. Column 12 gives the total number of cases investigated at given year.

	Risk Management:					CRA/ Compliance:			Specialty Examination:			
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2000	2232	235	2	0	17	2257			533	1585		6861
2001	2300	241	9	0	16	2180			466	1625		6837
2002	2290	229	5	0	10	1820			524	1681		6559
2003	2182	231	3	0	5	1610	307	2	501	2304		7145
2004	2276	236	3	0	0	1459	673	4	534	2570		7755
2005	2198	199	1	1	0	815	1198	7	450	2708		7577
2006	2184	201	1	2	0	77	1177	5	468	2584		7399
2007	2039	213	3	3	0	1241	528	4	418	2523		6972
2008	2225	186	2	1	2	1509	313	4	451	2577		7270
2009	2398	203	2	1	0	1435	539	7	493	2780		7858
2010	2488	225	0	3	4	914	854	12	465	2811		7776
2011	2477	227	3	1	4	825	921	11	466	2802	2734	10471
2012	2310	249	1	1	2	1044	611	10	446	2642	2585	9901
2013	2077	203	4	0	0	1585	396	5	406	2323	2328	9327
2014	1881	206	0	0	0	1019	376	11	428	2113	2126	8160
2015	1665	206	0	0	0	859	478	10	365	1886	1906	7375

Source: FDIC data

Table 8 provides the key statistics of the FDIC for the period of 2000 and 2015. The average total assets of the all FDIC-supervised institutions is $10.7 trillion in given period. The total assets of all FDIC-supervised institutions are increased steadily from 2000 to 2015. The only exception was the slight decline in total assets (3.9 percent decline in total assets) in 2009. The mean percentage of the total assets of all FDIC-supervised institutions in total US banking assets is 88.9 percent for the period of 2000 and 2015. The highest percentage of all FDIC-supervised institutions in total US banking assets was reached in 2001 (93.6 percent).

The average number of the FDIC-supervised institutions is 6,964. Due to the specialization of the banking regulatory institutions after essential policy changes, such as the Sarbanes-Oxley Act of 2012 and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the number of the FDIC-supervised institutions

follows a decline pattern in given time period (from 8315 institutions in 2000 to 5338 institutions in 2015).

Table 8: Key statistics of the FDIC.

In this table, all dollar amounts are in billion USD. Column 1 denotes the total assets of all FDIC-supervised institutions. Column 2 shows the percentage of all FDIC-supervised institutions in total US banking assets. Column 3 denotes the number of all FDIC-supervised institutions. Column 4 illustrates the number of employees. Column 5 is for the revenue of the FDIC. Column 6 denotes the percentage of assessments in revenue. Column 7 shows the total number of FDIC examination.

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2000	6246	91.9	8315	6452	2.57	3	6861
2001	6552	93.6	8080	6167	2.73	3	6836
2002	7077	83.3	7887	5430	2.385	5	6579
2003	7601	83.8	7767	5311	2.174	4	7145
2004	8420	83.3	7628	5078	2.24	5	7755
2005	9047	83.2	7523	4514	2.421	3	7577
2006	10098	85.1	7397	4476	2.644	1	7399
2007	11182	85.8	7279	4532	3.196	117	6972
2008	12313	88.9	7076	4988	7.306	60	7270
2009	11827	90.4	6829	6557	24.706	72	10556
2010	12069	90.6	6519	8150	13.38	102	10589
2011	12650	91.1	6275	7973	16.342	83	10471
2012	13388	92.7	6072	7476	18.522	67	9901
2013	13673	92.8	5847	7254	10.459	93	9817
2014	14475	93.1	5607	6631	8.965	97	8160
2015	14893	93.1	5338	6385	9.304	95	7375

Source: FDIC data

The average number of the FDIC employees is 6,085. The FDIC reaches the highest number of staff in 2010 (8,150). On the other hand, the revenue of the FDIC reached the highest level in 2012 ($18.52 billion). Before 2007, the percentage of the assessments in revenue is less than 5 percent. In the period after 2007, the assessments become the primary component of the revenue of the FDIC. In the geographic organisational chart, the FDIC serves in eight regional offices.

Appendix C, Table 11 provides the FDIC regional offices and the states in which the regional office is responsible. The key statistics state that the FDIC is the primary regulator of the US banking industry with the number of the supervised institution and the percentage of the total assets of the FDIC-supervised institutions in US banking system.

6.3. The Board of Governors of the Federal Reserve System

The Federal Reserve, which is the governing body of the Federal Reserve System, is a federal bank regulator in general. The Federal Reserve Act of 1913 defines the structure and the responsibility of the board.

In the pertinent part, the Federal Reserve Act, Section 10, 12 USC Section 241 (1913) states:

> "The Board of Governors of the Federal Reserve System (hereinafter referred to as the "Board") shall be composed of seven members, to be appointed by the President, by and with the advice and consent of the Senate, after August 23, 1935, for terms of fourteen years except as hereinafter provided, but each appointive member of the Federal Reserve Board in office on such date shall continue to serve as a member of the Board until February 1, 1936, and the Secretary of the Treasury and the Comptroller of the Currency shall continue to serve as members of the Board until February 1, 1936. In selecting the members of the Board, not more than one of whom shall be selected from any one Federal Reserve district, the President shall have due regard to a fair representation of the financial, agricultural, industrial, and commercial interests, and geographical divisions of the country."

In addition to the construction of the board, 12 USC Section 241 also provides the specifications of the board members: the act allows the president to select at least one board member with working experience at community banks. The Chair and the Vice Chair of Board of Governors are appointed by the president among the governors to serve for a four-year term. The president might reappoint them in their fourteen-year term.

The Federal Reserve is responsible for guiding monetary policy action by participating in the Federal Open Market Committee, to analyse domestic and international economic and financial conditions, to exercise supervisory control over the financial services industry, to administer certain consumer protection regulations, and to oversee the nation's

payments system. Additionally, the board oversees the activities of regional reserve banks and approves the appointments of their presidents.

The Federal Reserve also sets reserve requirements for depository institutions and approves changes in discount rates. All member banks hold stock in regional reserve banks and receive dividends. 40 percent of the commercial banks is the member of the Federal Reserve, and national banks are required to be members of the system; state-chartered banks can join the system if they meet the requirements of the system. The Federal Reserve also regulates bank holding companies, which have a controlling ownership interest in a bank or thrift. A bank holding company is defined in the Bank Holding Company Act of 1956.

The Bank Holding Company Act, Section 1, 12 USC Section 1841(a) (1956) states:

> "(1) Except as provided in paragraph (5) of this subsection, "bank holding company" means any company which has control over any bank or over any company that is or becomes a bank holding company by virtue of this chapter.
>
> (2) Any company has control over a bank or over any company if—
>
> (A) the company directly or indirectly or acting through one or more other persons owns, controls, or has power to vote 25 per centum or more of any class of voting securities of the bank or company;
>
> (B) the company controls in any manner the election of a majority of the directors or trustees of the bank or company; or
>
> (C) the Board determines, after notice and opportunity for hearing, that the company directly or indirectly exercises a controlling influence over the management or policies of the bank or company."

Table 9 shows the key statistics of the Federal Reserve between 2000 and 2015. The average total assets of the Federal Reserve-supervised state member banks is $1.78

trillion. On the other hand, the average total assets of the Federal Reserve-supervised large bank holding companies is $12.58 trillion. Additionally, the average total assets of the Federal Reserve-supervised small bank holding companies is $0.92 trillion. The period of 2000 and 2015 shows an increasing trend at the total assets of the state member banks, large bank holding companies, and small bank holding companies.

The average number of the Federal Reserve-supervised state member banks is 888. The average number of the Federal Reserve-supervised large (small) bank holding companies is 437 (4,466). Despite the smaller total assets, the average number of the Federal Reserve-supervised small bank holding companies is 4,466. For the given period, there is a slight decline in the number of state member banks and financial holding companies. Also, there is an upward for the number of the large bank holding companies. Conversely, the number of the small bank holding companies provides a downward trend from 2000 to 2015.

For the period of 2000 and 2015, the average number of employees of the Federal Reserve is 19,326. As a regulator, the Federal Reserve examines supervised institutions regularly. Especially, large bank holding companies are the subjects of continuous risk-focused examinations that take up to eighteen months. In addition to the regulatory responsibilities of the Federal Reserve, analysing domestic and international economic and financial conditions and other responsibilities of the institution increases the need for professionals from a wide range of disciplines. Under these circumstances, the Federal Reserve employs a huge volume of employees, compared to other banking regulatory institutions. Despite the need that is explained above, the continuous studies of the Federal Reserve on efficiency and recent technological improvements allow the Federal Reserve to decline the number of employees in the last decade: the number of employees was declined from 23,056 (2000) to 18,574 (2015) in the period.

In annual reports, the revenue of the Federal Reserve consists of three items: revenue from price services, claims for reimbursement, and other income.[8] Priced services of the

[8] Claims for reimbursement refers to "expenses of fiscal agency and depository services provided to the US Treasury, other government agencies, and other fiscal principals". Other income refers to "fees that

Federal Reserve are a range of payment and related services to depository and certain other institutions. The revenue of the Federal Reserve slightly was declined from 2000 to 2015, with an average of $1.19 billion per year. Additionally, the percentage of the priced services in revenue was declined from 75.26 percent (2000) to 39.64 percent (2015). The average number of examination of state member banks is 536 per year. The mean of the number of examination of large (small) bank holding companies is 553 (3,169). The number of examination per year provides a downward trend in the given period. On the other hand, the number of examination of large bank holding companies per year was steadily increased from 2000 to 2015. On the contrary, the number of examination of small bank holding companies declined from 3,264 (2000) to 2,709 (2015).

Table 9: the Federal Reserve key statistics.

In this table, large bank holding companies denotes bank holding companies with total assets more than $1 billion. All dollar amounts are in billion USD. Column 1 denotes total assets of all Federal Reserve-supervised state member banks. Column 2 denotes total assets of all Federal Reserve-supervised large bank holding companies. Column 3 denotes total assets of all Federal Reserve-supervised small bank holding companies. Column 4 denotes the number of all Federal Reserve-supervised state member banks. Column 5 denotes the number of all Federal Reserve-supervised large bank holding companies. Column 6 denotes the number of all Federal Reserve-supervised small bank holding companies. Column 7 denotes the number of domestic financial holding companies. Column 8 denotes the number of foreign financial holding companies. Column 9 is the number of the Federal Reserve employees. Column 10 is the total revenue of the Federal Reserve. Column 11 is the percentage of revenue from priced services in total revenue.

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2000	1645	6213	716	991	309	4800	462	21	23056	1.226	75.26
2001	1823	6905	768	970	312	4816	567	23	23438	1.245	76.44
2002	1863	7483	821	949	329	4806	602	30	22297	1.227	74.14
2003	1912	8295	847	935	365	4787	612	32	21459	1.216	73.05
2004	1275	8429	852	919	355	4796	600	36	20217	1.3	70.3
2005	1318	10261	890	907	394	4760	591	38	19433	1.36	70.58
2006	1405	12179	947	901	448	4654	599	44	19256	1.459	70.44
2007	1519	13281	974	878	459	4611	597	43	19030	1.472	68.78
2008	1854	14138	1008	862	485	4545	557	45	17965	1.336	65.39
2009	1690	15744	1018	845	488	4486	479	46	17398	1.127	59.93
2010	1697	15986	991	829	482	4362	430	43	17015	1.033	55.66
2011	1891	16443	982	828	491	4251	417	40	17120	0.966	49.57
2012	2005	16112	983	843	508	4124	408	38	17724	0.958	46.93
2013	2060	16269	953	850	505	4036	420	39	18058	0.974	45.33
2014	2233	16642	953	858	522	3902	426	40	17172	1.006	43.07
2015	2356	16961	938	839	547	3719	442	40	18574	1.083	39.64

Source: Federal Reserve data

depository institutions pay for the settlement of the Fedwire Securities Service transactions for Treasury securities transferred" (Board of Governors of the Federal Reserve System, 2016).

The Federal Reserve System consists of a network of 12 Federal Reserve Banks and 24 branches. Appendix D, Table 12 provides 12 Federal Reserve Banks and the regions in which the Federal Reserve Bank is responsible.

7. Conclusion

The bank is one of the essential parts of the financial intermediation in economies; it effectively transforms funds from deposits to loans by differentiating the maturities and supports the economic growth by increasing the efficiency of funds. The academic literature has stressed the advantages of this financial institution in comparison to other components of financial intermediaries as a motivation for fund providers and borrowers.

The banking in the US has different meanings in different time periods. Commercial banks, investment banks, thrift institutions, insurance companies, and finance companies are all located in the banking industry with their rigid structures and highly regulated natures. In this group, commercial banks, as depository institutions, become the leading part of the industry, by collecting the most of the funds from household and provide the largest variety and number of services for their customers. Despite the wide range of investment instruments, increased importance of pension and mutual funds, the financial markets are still dominated by depository institutions, especially commercial banks. The number of banks shows dramatic changes in the last five decades. The number of banks has been declined from the 15,000 level to 5,000 level when the number branches and offices have been boomed. In this period, the number of small banks has been declined; the possible reasons for this decrease are the increased number of mergers and acquisitions, growing of small banks, and bank failures. The number of mid-sized banks has been provided with an upward trend in number when the large banks have stayed the same in number. In addition to the change in number and structure of banks, banks also performed differently at a different period. The change in the investment strategies of investors and technological progress are the examples of factors that affect the bank performance permanently by changing the level of assets, loans, and deposits. Specifically, the effect of the recent financial crisis has been captured on balance sheets of banks. During the recent financial crisis and recession, net incomes of banks declined dramatically, and ratios that point out the profitability and efficiency of banks reached the

worst levels. Although the recovery period has been started in the industry, the performance and effectiveness measures of banks are still away from pre-crisis period.

Financial intermediation role, risk behaviour, and opaqueness on transactions of banks make them special in corporate governance applications. By increasing the functionality of board of directors to maintain the monitoring and advising role of the boards, changing the structure of boards to provide independence, and restricting specific investors that might affect the ownership structure of banks are the instruments that are investigated in the literature to ensure good corporate governance in banks. In addition to the instruments that are mentioned above, changes in regulations and implications of regulations in bank management aim to solve the principal-agent problem.

The regulatory environment of banks has been changed dramatically. After the great depression, the need for separation of commercial and investment banking satisfied by Glass-Steagall Act of 1933 until elimination of separation in 1999. Between the 1930s and 1970s, banks were protected from geographical competition and interstate banking and branching were forbidden. In addition to the regulatory environment, the investment preferences of customers, payment methods, and technology in banking industry maintained the boom in the number banks, especially small banks with less than $300 million in total assets. The 1980s and 1990s were the periods of relaxing the constraints on interdisciplinary competition among financial institutions and geographical competition among banks. Specifically, the Depository Institutions Deregulation and Monetary Control Act of 1980 and Garn-St. Germain Depository Institutions Act of 1982 allowed banks to gain a competitive advantage against non-bank investment instruments. The Gramm-Leach-Bliley Act of 1999 repealed the restrictions on separation of commercial and investment banking. In the deregulation period between 1999 and 2010, banks took advantage of risky investments, new financial instruments, and improved information technology in the pre-crisis period. Then, the Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010 to set the walls to regulate the financial markets again.

In the economy, six types of regulations are set up to increase the net social benefits of banks. These types of regulations are: (i) maintaining safety and soundness of banks, (ii)

supporting monetary policies of central banks, (iii) providing efficient intermediation role on non-financial sectors, (iv) regulating entry and chartering of banks, (v) protecting customers, and (vi) protecting investors. In the US, banks are mainly regulated by the Federal Reserve, FDIC, and OCC.

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Appendix A: Selected Bank Balance Sheet Items

1. Total Assets

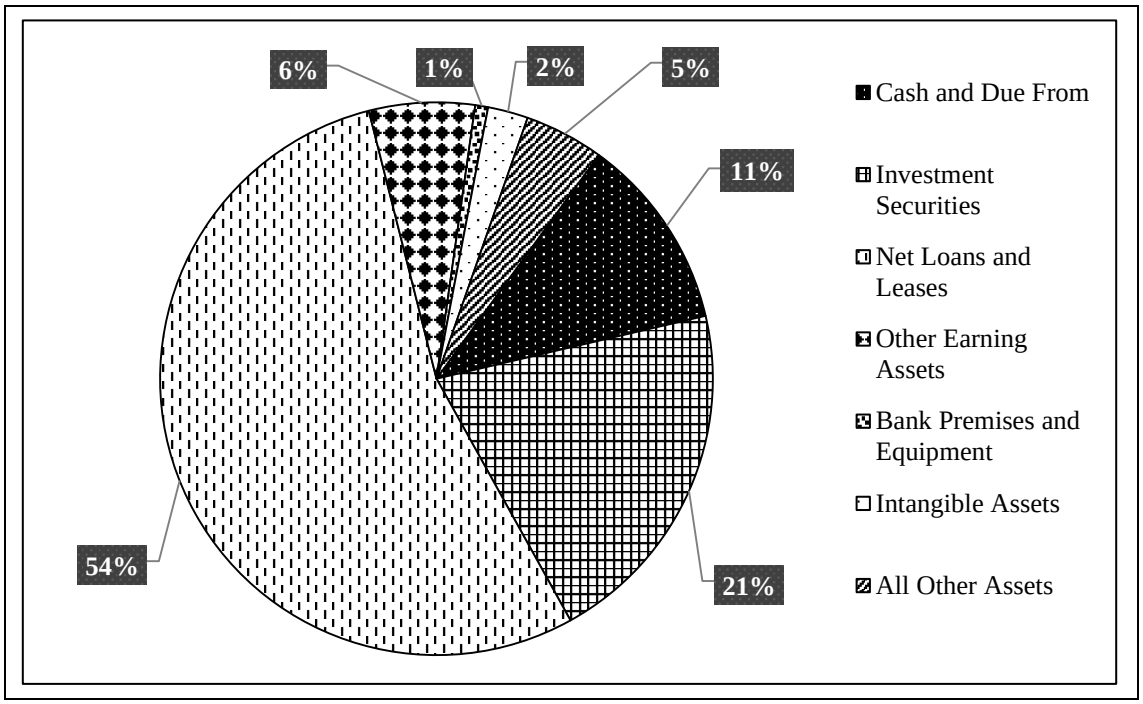
In general, assets of a bank are grouped in four main categories: (i) investment securities, (ii) cash and due from depository institutions, (iii) other assets, and (iv) loans and leases. Repurchase agreements, Treasury and agency securities, municipals, and mortgage-backed securities are the examples of investment securities that generate income for the banks.

Additionally, banks might hold investment securities with the purpose of liquidity risk management; banks might choose to use them to satisfy their liquidity needs in unexpected conditions. High liquidity with low default risk of these assets make them easy to trade in secondary markets. On the other hand, the bank income that can be generated from investment securities is low compared to loans and leases. Thus, large banks are tend to minimize the amount of investment securities that they hold. In order to manage the cash flows on consolidated statements, banks hold vault cash for the cash needs of customers.

In addition, deposits at the Federal Reserve and deposits at other financial institutions are counted in cash and due from depository institutions. In order to meet legal reserve requirements, to purchase or sale Treasury securities, to assist in wire transferring, to transfer checks, deposits at the Federal Reserve are primarily used. Other assets, which are the small part of total assets, cover fixed assets, intangible assets, deferred taxes, prepaid expenses.

Chart 4 provides the distribution of total assets, as of 31st of December 2015.

Chart 4: Total assets, as of 31st of December 2015

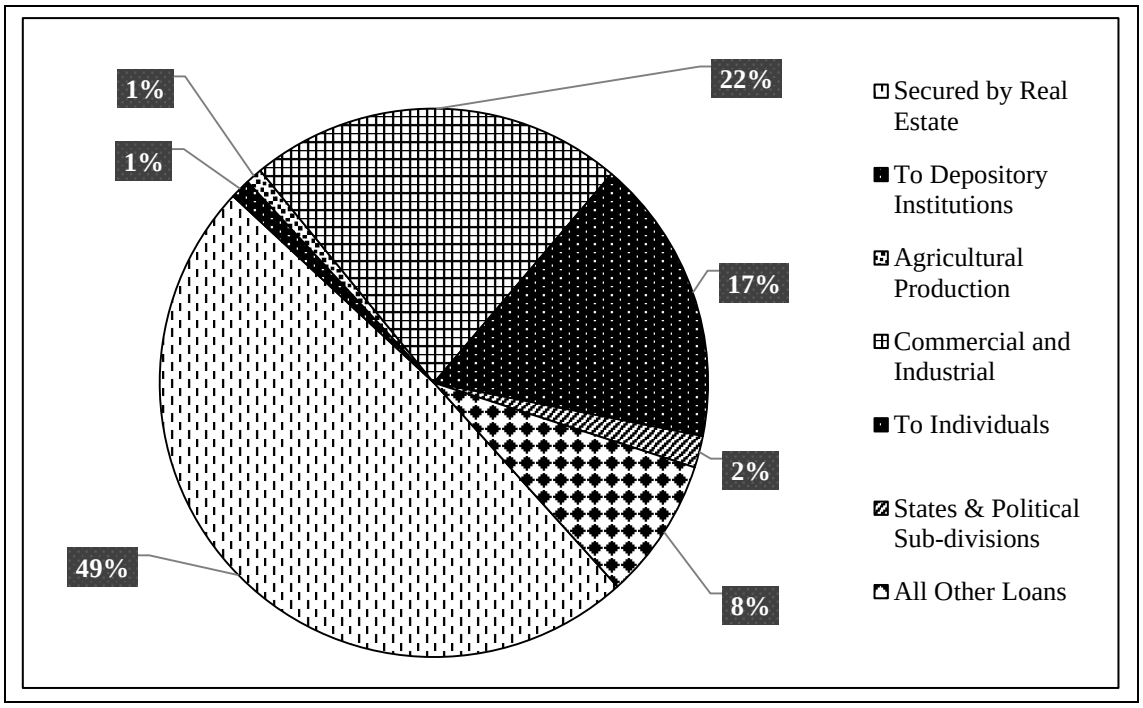


Source: Federal Deposit Insurance Corporation, Quarterly Banking Profile

2. Total loans

As major sources of default and liquidity risks, loans and leases are the least liquid bank asset items. On the other hand, they generate the largest income revenue. With two forms of secured loans (backed by assets of the borrower) and unsecured loans, commercial and industrial loans are employed by banks to satisfy infrastructural and machinery needs of the production in firms. Additionally, as another type of loans and leases, real estate loans contain mortgage loans and commercial real estate mortgage loans. Consumer loans are individual and consumer loans through credit cards and proprietary credit cards. Other loans cover the loans to state and local government agencies, foreign banks, and other financial institutions. The distribution of total loans and leases on 31st of December 2015 is provided in Chart 5.

Chart 5: Total loans and leases, as of 31st of December 2015

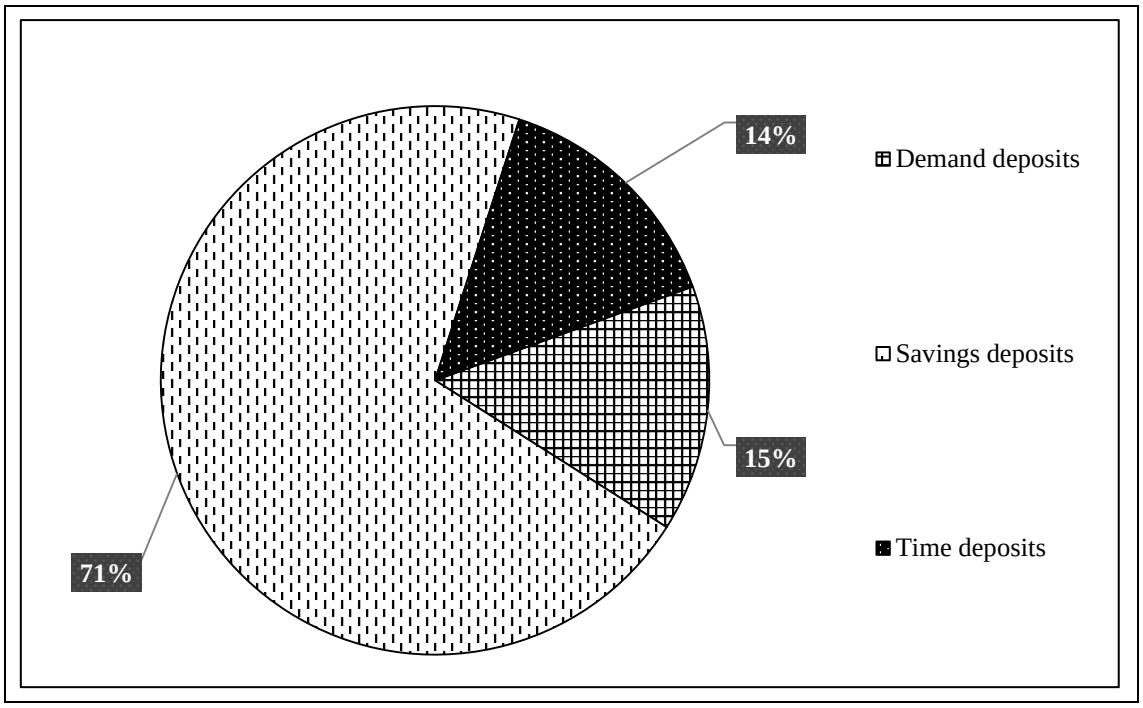


Source: Federal Deposit Insurance Corporation, Quarterly Banking Profile

3. Deposits

Deposits consist of demand deposits, savings deposits, and time deposits. The transaction accounts that belong to individuals, corporations, partnerships, and government with no interest payment is the demand deposits in bank balance sheets. There is restriction for corporations on using deposits; corporations can only use demand deposits. Thus, this restriction makes corporations the major demand deposits holder. Savings deposits, interest bearing deposits, denote the money that is deposited by the customers for any non-immediate use. The customer is allowed to make up to six withdrawals or transfer per month. Time deposits are also interest bearing deposits; the difference between the time deposits and savings deposits is the maturity date of time deposits. The maturity date is used to set up a fixed term and needs the notice of customer before withdrawal. Chart 6 provides the distribution of deposits, as of 31st of December 2015.

Chart 6: Deposits, as of 31st of December 2015



Source: Federal Deposit Insurance Corporation, Quarterly Banking Profile

Appendix B: OCC districts

Table 10: the OCC districts and city offices in 2015

Western District	Central District	North-Eastern District	Southern District
Albuquerque, New Mexico	Alexandria, Minnesota	Boston, Massachusetts	Amarillo, Texas
Billings, Montana	Cleveland, Ohio	Charleston, West Virginia	Atlanta, Georgia
Denver, Colorado	Champaign, Illinois	Charlotte, North Carolina	Birmingham, Alabama
Des Moines, Iowa	Chicago, Illinois	Edison, New Jersey	Dallas Field Office, Texas
Joplin, Missouri	Cincinnati, Ohio	New York, New York	Fort Worth, Texas
Kansas City, Kansas	Columbus, Ohio	Philadelphia, Pennsylvania	Houston, Texas
Los Angeles, California	Detroit, Michigan	Pittsburgh, Pennsylvania	Jacksonville, Florida
Omaha, Nebraska	Evansville, Indiana	Roanoke, Virginia	Little Rock, Arkansas
Phoenix, Arizona	Fargo, North Dakota	Syracuse, New York	Longview, Texas
Salina, Kansas	Indianapolis, Indiana	Washington, D.C.	Lubbock, Texas
Salt Lake City, Utah	Iron Mountain, Michigan	Wilkes-Barre, Pennsylvania	Memphis, Tennessee
San Diego, California	Louisville, Kentucky		Miami, Florida
San Francisco, California	Milwaukee, Wisconsin		Nashville, Tennessee
Santa Ana, California	Peoria, Illinois		New Orleans, Louisiana
Seattle , Washington	St. Louis, Missouri		Oklahoma City, Oklahoma
Sioux Falls, South Dakota			San Antonio, Texas
Wichita, Kansas			Tampa, Florida
			Tulsa, Oklahoma

Source: OCC data

Appendix C: FDIC regional offices

Table 11: the FDIC regional offices and states in 2015

Atlanta Regional Office	Chicago Regional Office	Dallas Regional Office	Memphis Regional Office	Kansas City Regional Office	New York Regional Office	Boston Regional Office	San Francisco Regional Office
Alabama	Illinois	Colorado	Arkansas	Iowa	Delaware	Connecticut	Alaska
Florida	Indiana	New Mexico	Louisiana	Kansas	District of Columbia	Maine	Arizona
Georgia	Kentucky	Oklahoma	Mississippi	Minnesota	Maryland	Massachusetts	California
North Carolina	Michigan	Texas	Tennessee	Nebraska	New Jersey	New Hampshire	Hawaii
South Carolina	Ohio			North Dakota	New York	Rhode Island	Idaho
Virginia	Wisconsin			South Dakota	Pennsylvania	Vermont	Montana
West Virginia					Puerto Rico		Nevada
					Virgin Islands		Oregon
							Utah
							Washington
							Wyoming

Source: FDIC data

Appendix D: FED districts

Table 12: the Federal Reserve Banks and twelve Federal Reserve districts in 2015

Name of the Federal Reserve Bank	The city of the Federal Reserve Bank headquartered
Federal Reserve Bank of Boston	Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont
Federal Reserve Bank of New York	New York, Twelve counties in Northern New Jersey, Fairfield County in Connecticut, Puerto Rico, Virgin Islands
Federal Reserve Bank of Philadelphia	Eastern Pennsylvania, Southern New Jersey, Delaware
Federal Reserve Bank of Cleveland	Ohio, Western Pennsylvania, Eastern Kentucky, The northern panhandle of West Virginia
Federal Reserve Bank of Cleveland	Maryland, Virginia, North Carolina, South Carolina, Most of West Virginia
Federal Reserve Bank of Atlanta	Alabama, Florida, Georgia, Parts of Louisiana, Mississippi, Tennessee
Federal Reserve Bank of Chicago	Iowa, Most of Illinois, Indiana, Michigan, Wisconsin
Federal Reserve Bank of St. Louis	Arkansas, Missouri, Mississippi, Tennessee, Kentucky, Indiana, Illinois
Federal Reserve Bank of Minneapolis	Minnesota, Montana, North Dakota, South Dakota, Twenty-six counties in North-Western Wisconsin, Upper Michigan
Federal Reserve Bank of Kansas City	Colorado, Kansas, Nebraska, Oklahoma, Wyoming, Northern New Mexico, Western Missouri
Federal Reserve Bank of Dallas	Texas, Northern Louisiana, Southern New Mexico
Federal Reserve Bank of San Francisco	Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Utah, Washington, American Samoa, Guam, Mariana

Source: Federal Reserve data

Paper 2

CEO Power, Information Advantage, and Bank Risk:
Evidence from Publicly-listed US Banks

Abstract

This paper examines whether information advantage of the CEO can influence bank risk to add empirical evidence to hypothesised relationship from the perspective of the CEO power. CEO tenure and CEO network size that denote the sources of information advantage are used as the CEO power variables. By employing the sample that consists of 908 publicly-listed US banks for the period of 1998 and 2015, the effect CEO power on three measures of bank risk is assessed: Z-score, systematic risk, and systemic risk. Results from fixed effects and generalised method-of-moments (GMM) dynamic panel data estimations reveal that banks are more likely to take on excessive risks when CEO's have a relatively long tenure and large network. The results of the robustness tests provide the same connection between CEO power and bank risk.

1. Introduction

The interests of researchers and regulators on how to mitigate excessive risk taking of banks provide an emerging literature recently. Also, the intermediation role of banks increases the importance of mechanisms to control the banks' excessive risk taking behaviour. To the extent that the recent financial crisis pointed out the importance of risk management of financial institutions, the central role of banks in the overall economy, and the influence of safety and soundness of an individual bank on the stability of the entire financial system.

With the purpose of detecting characteristics of banks that differentiate them from non-financial firms, the banking theory draws the solid line of the borders (Diamond, 1984; Diamond and Dybvig, 1983; Merton, 1977).[9] One of the main features of a bank is the capacity of changing the maturity and increasing the volume of funds that support the economic growth (Levine et al., 2000). Also, Laeven (2013) states the four most important aspects of banks different than non-financial firms: high leverage, diffused debtholders, large creditors, and distinct regulations. The first three aspects of banks mentioned above point out the intermediation role of banks; banks, which are highly regulated by authorities, accept short-term liquid deposits and transform these deposits into long-term loans. Distinct regulations on banks make them unique because banks are the subjects of deposit insurance guarantees. In general, the deposit insurance, which is explicit or implicit to provide further capital assistance (i.e., bailouts) and emergency liquidity (Bhattacharya and Thakor, 1993), is designed to prevent depositors and the whole financial system from the adverse consequences of the failure of a bank (Demirgüç-Kunt et al., 2015).

Evidently, the characteristics mentioned above also differentiate the bank risk taking. Despite the fact that the purpose of the deposit insurance is to protect depositors from

[9] Merton (1977) states that banks are the riskless source of short-term lending needs of firms and individuals rather than direct market transactions of fixed-income securities. Diamond and Dybvig (1983) establish the model that shows how bank deposit contracts attract the deposits of households to complete the intermediation role of banks. Furthermore, Diamond (1984) provides the theoretical background of sufficient loan production of banks to respond the needs of the depositors in risk-free environment.

large losses due to bank failures and to assure the stability of the entire financial system, deposit insurance might be the source of risk taking (Aebi et al., 2012; Nicolo et al., 2010). The deposit insurance acts like a put option on bank's assets (Merton, 1977) and the value of this put option on assets increases when the bank takes the excessive risk (Kareken and Wallace, 1978). Hence the presence of deposit insurance increases bank's risk taking, and this argument is supported by findings of studies in the growing literature (i.e., Dam and Koetter, 2012; Hovakimian et al., 2002). In addition to the mechanism of deposit insurance that increases bank's risk taking, moral hazard problem, which arises after the establishment of a contract, might be another source of risk taking. The presence of deposit insurance might lead the executive managers and shareholders of a bank to transfer the bank risk to the authorities as the lenders of the last resort (Drechsler et al., 2016) and make risk taking easy (Hellmann et al., 2000).

In addition to the presence of deposit insurance, the intermediation role of banks is another source of bank risk taking. The negative consequence of intermediation role of banks is opaqueness of banks in their transactions. As creditors, banks use their expertise of collecting and processing information to monitor their loan portfolios with the hands of their executive managers (Mehran et al., 2011). On the other hand, depositors and other external stakeholders are not fully armed with the tools that provide a similar information advantage on loan portfolio of banks and cannot retain relevant information to evaluate the actual value of bank assets (Diamond, 1991, 1989; Morgan, 2002). The information disadvantage of them allow executive managers of banks to follow policies that increase risk taking and the detection of these policies from the released financial information (i.e., quarterly released bank balance sheet information) becomes complex (Becht et al., 2011; Mehran et al., 2011).

The tendency of exporting risk from own to central banks and information advantage of executive managers exacerbate risk taking concerns. Under these conditions, the optimal level of risk, which indicates the level of risk taken by managers to maximise the shareholder wealth without taking the social and economic responsibilities of default (Stulz, 2015), and its connection with corporate governance becomes essential.

The literature that investigates the connection mentioned above provides a broad range of studies. In them, the purpose is to detect the connection and understand the mechanisms that increase risk taking in banks by employing various corporate governance related proxies.[10] In recent studies, Berger et al. (2014a) and Minton et al. (2014) examine the effect of demographics of directors on bank risk taking. The findings of these studies indicate that age, gender diversity, education and experience of directors are associated with bank risk taking, which is measured by the proxies for equity risk, leverage risk, and portfolio risk. The studies on bank CEOs provide significant relationships between CEO related proxies and bank risk taking. For example, Hagendorff and Vallascas (2011) and DeYoung et al. (2013) investigate the relationship between stock-based bank CEO compensation and equity risk; the results of both of these studies indicate that there is a positive and significant relationship. On the other hand, Bennett et al. (2015) and Bekkum (2016) indicate the negative relationship between CEO compensation and default risk.

A growing literature focuses on the relationship between Chief Executive Officers (CEOs) and firm-level risk. One strand of it examines stresses how links between CEO compensation, shareholder value, and corporate leverage provide incentives for excessive risk taking (Chakraborty et al., 2007; Chava and Purnanandam, 2010; Chen et al., 2006; DeYoung et al., 2013; Gormley et al., 2013). More recently, attention has shifted to the innate attributes of CEOs and their risk-taking incentives, such as sensation seeking, overconfidence, education, life experiences, religious belief, and political affiliations (Bertrand and Schoar, 2003; Cain and McKeon, 2016; Graham et al., 2013; Hilary and Hui, 2009; Hirshleifer et al., 2012; Hutton et al., 2014; Malmendier and Tate, 2008). However, the literature has largely ignored the role of powerful CEOs in determining bank risk, which is given the many ways to affect firm behavior and outcomes, including financial performance (Adams et al., 2005), the likelihood of engaging in earnings management (Hu et al., 2015), driving corporate acquisitions (Brown and Sarma, 2007; Haynes and Hillman, 2010; Malmendier and Tate, 2008, 2005), influencing the composition of boards of directors to prevent a dilution of power maintain (Combs et al.,

[10] There is a growing literature on firm risk taking and its connection with corporate governance (e.g., Jin (2002); Rajgopal and Shevlin (2002); Kleffner et al. (2003); Drew and Kendrick (2005); Coles et al. (2006); Ferreira and Laux (2007); Wright et al. (2007); John et al. (2008); Low (2009); Bargeron et al. (2010); Acharya et al. (2011); King and Wen (2011); Nguyen (2011); Nakano and Nguyen (2012); Huang and Wang (2015); Faccio et al. (2016)).

2007), shaping incentive contract design to their own advantage (Morse et al., 2011), and that more CEO power tends to be associated with lower credit ratings of a firm's debt (Liu and Jiraporn, 2010).

In this paper, the purpose is to add empirical evidence to hypothesised relationship between CEO power and bank risk from the perspective of network size and tenure of CEO and help to fill the gap in corporate governance and bank risk taking literature; it is hypothesised that bank risk taking is more likely to banks with powerful CEOs. There are three risk proxies are employed: (i) Z-score that indicates the insolvency risk of a bank; (ii) systematic risk that indicates the uncertainty inherent to the entire market; (iii) systemic risk that shows the probability of collapse of the whole market.

A possible link between powerful CEOs and bank risk is the impact of CEOs on firm culture. Several scholars of organizational behaviour have suggested that the origins of an organizations' culture can be found in the values and personalities of its leaders (Baron and Hannan, 2002; Detert et al., 2000), and the leadership attributes of the CEO can affect the culture of the firm (Berson et al., 2008; Giberson et al., 2009). It is quite possible that culture might incline the firm towards greater risk taking, which is expected to reflect characteristics of the CEO.

The first power measure of this study is CEO tenure, which denotes the number of years the CEO has served in the same position, with power viewed as increasing with length of tenure because tenure builds decision-making autonomy (Combs et al., 2007; Hermalin and Weisbach, 1998). Also, several studies suggest longer tenure is associated with a decrease in career concerns (Hill and Phan, 1991; Milbourn, 2003; Yudan Zheng, 2010), also suggesting that tenure is positively associated with risk-taking. However, it is recognised that the impact of tenure on risk taking is somewhat ambiguous. For example, an entrenched CEO might enjoy larger private benefits from control, which could encourage low-risk projects (Bertrand and Mullainathan, 2003; John et al., 2008; Laeven and Levine, 2009). Also, there is a suggestion that less experienced individuals tend to be more overconfident, and therefore experience might lower the level of overconfidence and reduce risk taking (Gervais and Odean, 2001). The second power measure is CEO network size, where the network denotes the number of other CEO's with whom the CEO

overlaps while in employment, social activities, education roles at the same company, organisation, or institutions in given year. Networks support CEO power because of the informational advantages that they generate for CEOs (Brass et al., 2004; Faleye et al., 2014; Jackson, 2010; Madhavan et al., 1998). By using their broader networks, CEO might benefit from the information advantage they have, increasing information asymmetries within the firm, and exacerbating the adverse selection problem that is one of the reasons of excessive risk taking.

In multivariate analyses of this study, in addition to the proxies that measure the CEO power, CEO age, CEO gender diversity, CEO experience, and CEO education are employed as CEO related variables. Board size and board independence measures are employed to control the effect of board structure. Bank specific variables are controlled by employing liquidity, leverage, loan loss provisions, capital asset ratio, cost-to-income ratio, return on assets (ROA), and size (natural logarithm of total assets) measures; one-term lagged values of bank-specific variables are employed. The percentages of institutional and individual ownerships and HH-Index as concentration ratio measures are used to control the ownership structure of banks. By employing the sample of 908 publicly listed US banks for the period of 1998 and 2015, the hypothesised relationship is examined by bank and year fixed effects regressions. Also, generalised method-of-moments (GMM) dynamic panel data estimator, which is designed to deal with simultaneity and omitted variable biases (Levine et al., 2000), is employed to test the hypothesised relation by mitigating endogeneity concerns.

The model is re-estimated with the sample that only covers the pre-Dodd-Frank Act of 2010 period to detect the effect of CEO power variables on bank risk before the recent and significant regulatory changes on financial institutions. Also, the model is re-estimated by employing executive power variables. The term "executive" denotes the board members and the CEO of a bank. To specify professionals who have an information advantage, the sample takes these two groups (CEOs and board members) as one group and defines this combined group as "executives" (Demsetz et al., 1997). In a similar setting, as power variables, executive tenure and executive network size denote the winsorized average of the tenure of board members and the CEO and the average number of network nodes of board members and the CEO respectively.

The results from fixed effects and GMM estimates, with the CEO power variables are entered individually and together, show that the coefficients on the CEO power variables are positive and highly statistically significant in the estimates of each risk indicator. Specifically, in estimates of Z-score, longer CEO tenure and larger CEO networks are associated with an increase in bank risk. By supporting the hypothesis constructed in this study, it is interpreted that bank risk increases as CEO power increases. Moreover, the risk appears to be related to CEO age and experience, with risk taking appearing to decline as CEO's age and gain more expertise in the job, which would be consistent with powerful CEOs enjoying larger private benefits from control later in their careers. Less well-educated CEOs also appear to favour more risk taking. The results indicate that corporate governance institutions have some effect in constraining CEO power, with larger and more independent executive boards associated with reduced bank risk taking. The bank-specific variables indicate that banks take on less risk if they are more liquid, more highly leveraged, are better capitalised and are more profitable, and that an increase in loan loss provisions and bank size are associated with greater risk taking activities. Except for liquidity, this is broadly in line with what the literature suggests. Finally, the results support the view that a larger share of institutional investor owners is associated with more risk taking, though greater ownership concentration seems to mitigate risk consistent (though the coefficients are only statistically in the GMM estimates).

The results do not change substantially when the systematic and systemic indicators of bank risk are employed as the dependent variables, respectively. Specifically, CEO power is associated with greater bank risk on these risk measures also. However, of the individual CEO characteristics, only age appears to be consistently important in determining (reducing) risk. Board size and board independence also constrain risk taking on these risk measures, and the bank-specific variables act in broadly the same manner as in the results for the Z-score measure of risk. Of the ownership-related variables, only the coefficient on the institutional investors share is consistently significant where it indicates an association with more risk taking.

The re-estimation results for the sample of the pre-Dodd-Frank period, and executives also provide similar results and indicates that there are positive and significant relationships between CEO power variables and bank risk taking. Economically

meaningful and robust empirical evidence of this study suggests that information advantages of CEOs related to CEO power lead banks to take more risk.

The paper is organised as follows. Section 2 provides the review of the literature on corporate governance associated with risk taking, bank risk taking, the effect of the recent financial crisis on risk taking, and risk management and regulations at international level. Section 3 describes the main dataset and the empirical methodology. The descriptive and estimation results are presented and discussed in Sections 4 and 5. Section 6 summarises the findings and concludes the paper.

2. Literature Review

2.1. Risk-taking in corporate governance literature

The connection between corporate governance and firm risk taking is an emerging topic of the related literature. As an early example, Jensen and Meckling (1976) define the relationship between principal and agent with the term of contract that defines the responsibilities and duties of the counterparts. This conceptual framework of contract provides the risk-taking functionalities of principals and agents as well as other functionalities of counterparts in terms of corporate governance implications.

In the last three decades, the studies have focused on the corporate governance mechanisms, characteristics of the firm executives, and firm risk taking behaviour by employing various proxies for different time periods.[11] As an early example of the studies in the last three decades, May's (1995) study investigates the relationship between the personal preferences of the CEOs on risk taking and firm risk. The wealth of the CEO that is highly tied to the equity prices of the firm diversifies the firm risk taking behaviour. On another side of the research, the findings point out that the time the CEO spends in the firm also diversifies the risk taking. In addition to the characteristics of CEO (compensation and tenure), the specialty of the CEO on technological developments also affects the diversity of the firm risk taking behaviour; the firm faces the risk of the new

[11] The theoretical background and detailed discussion are provided in Appendix A.

business lines according to the preferences of the CEO, and the poor performance of the existing business lines depends on the new ones.

By employing the sample of more than 2,000 publicly listed US firms for the period of 1992 and 1998, Jin (2002) examines the relationship between CEO incentive level and firm risk characteristics. The systematic and non-systematic risks are defined as the components of the risk. The findings of the study indicate that incentive level of the CEO declines with firm's non-systematic risk when the CEO has no ability to trade market portfolio. Rajgopal and Shevlin (2002) argue that the previous literature before their study focuses on the value relevance of the compensation, which does not represent the true relationship between incentive and risk taking behaviour of firms. The findings of their study point out that the incentive of a manager increases the risk taking of a firm if the investment on the risky venture provides positive net present value. The findings of Nam et al.'s (2003) study that indicates the increased firm risk because of the decisions of the managers when their option compensation is closely correlated with the stock return volatility is in line with the findings of Rajgopal and Shevlin's (2002) study.

By employing the risk proxies of delta (the change in the dollar value of an executive's wealth for one percent point change in stock price) and vega (the change in the dollar value for 0.01 change in standard deviation of annual stock returns), Coles et al. (2006) assess the effect of executive compensation on investment policy and risk taking of firm. By controlling the effect of the delta, the findings of the study indicate that higher vega leads executives to choose risky investment choices. Also, further findings show that risky choices on investment portfolios affect the compensation structure of executives with higher vega and lower delta; stock return volatility has a positive and significant effect on both delta and vega. By investigating the exogenous increase in takeover protection in Delaware during the mid-1990s, Low (2009) points out that equity-based compensation of executives affects managers' risk taking behaviour. This relationship also has an effect on shareholder wealth. The increase in takeover protection in Delaware declined the risk more in firms with low managerial equity-based incentives. On the other hand, the findings of Wright et al.'s (2007) study point out that there is a negative relationship between fixed incentives of managers and firm risk taking.

In addition to the characteristics of the CEO and risk taking, different corporate governance mechanisms that affect the decision making and various risk measures are also investigated in the literature. Bargeron et al. (2010) investigate the effect of Sarbanes-Oxley Act of 2002 on risk taking of publicly listed US firms. One of the main functions of the act is to decline the excessive risk by expanding the role of independent directors, increasing in director and officer liability, and increasing the functionality of internal controls. By employing a sample of 1,846 US and 407 non-US publicly listed firms, Bargeron et al. (2010) point out that some of the measures related to risk taking decline in US firms compared to non-US firms after the release of the act; the magnitude of the decline is related to firm characteristics such as board structure and firm size.

The literature that investigates the relationship between corporate governance and risk-taking is not limited to empirical studies. In a theoretical study, Drew and Kendrick (2005) provide the five pillars of the corporate governance related frameworks such as culture, leadership, alignment, structure, and system, and the effect of these pillars on the enterprise risk of a firm. The main idea behind this classification of corporate governance mechanisms is to isolate the external and internal forces that shape risk exposures in firms.

Another important aspect of corporate governance mechanisms is information flow that is supported by antitakeover provisions. By employing the sample of 1,248 publicly listed US firms for the period of 1990 and 2001, Ferreira and Laux (2007) examine the relationship between corporate governance policy and idiosyncratic risk. The results show that firms with fewer antitakeover provisions have a higher idiosyncratic risk and private information. Especially, the relation between governance and idiosyncratic risk is stronger at mergers of investors that have private trading information. In addition to the importance of information flow, investor protection is essential in corporate governance. The findings of John et al.'s (2008) study show that investor protection has a significant effect on firm risk taking; riskier but value-enhancing investments could be chosen by firms in the better investor protection environments. Better investor protection declines the private benefit of investors that generate risk avoidance at other investors' decisions.

Corporate governance mechanisms, which aim to decline the principal-agent problem, target to raise the shareholder representation on managerial affairs of the firm. The daily

affairs of a firm that is run by an agent might be source of principal-agent problem. In this manner, King and Wen (2011) investigate the shareholder governance and firm risk taking relation in a sample of 7,689 different US firms for the period of 1990 and 2005. The results indicate that the overall corporate governance structure has a significant effect on managerial risk taking, especially in managerial investment decisions. In addition to this general conclusion, it is detected that strong bondholder governance in firms also declines the managerial risk taking in investments.

In addition to the studies on shareholders, the literature provides examples of studies that investigate the effect of stakeholders on firm risk taking. In a cross-country study, Acharya et al. (2011) show that stronger credit rights in bankruptcy have a significant effect on corporate risk taking by affecting corporate investment choices of the firm. Additionally, it is indicated that strong creditor rights protect firms from value-reducing acquisitions and declines cash flow risk and leverage of the firms.

The corporate governance system of a nation differentiates and shapes the overall economic performance; corporate governance of a firm influences the production efficiency at the corporate level. Even though the related literature provides the studies that examine the association between corporate governance structure and risk taking of US firms, there are some studies for the sample of other countries that have different corporate governance practices and regulations. For example, Nguyen (2011) and Nakano and Nguyen (2012) examine the corporate governance structure and risk taking of Japanese firms. Both studies point out that strong corporate governance structure that denotes larger and more independent boards and the presence of institutional ownership of firms decline the several risk measures such as idiosyncratic risk and default risk of Japanese firms. Kleffner et al. (2003) provide the empirical results on Canadian firms by investigating the effect of corporate governance on risk management, while Huang and Wang (2015) investigate the similar relationship in Chinese firms. In the European context, the study of Faccio et al. (2016) that investigates the effect of CEO gender on corporate risk taking of European firms is one of the recent examples of studies on corporate governance and risk taking.

2.2. Risk taking and corporate governance in banking industry

In addition to the growing literature on risk taking of non-financial firms, the literature on association between bank risk taking and capital structure of the bank (Wheelock and Wilson, 2000), operating efficiency of the bank (Kwan and Eisenbeis, 1997), funding sources of the bank (Demirgüç-Kunt and Huizinga, 2010), and securitization of the bank (Keys et al., 2010; Mian and Sufi, 2008) studied. The studies that investigate how to mitigate excessive bank risk taking emerge and point out the vulnerable effect of excessive bank risk taking on the safety and soundness of the entire banking system as well as of individual financial institutions.

The structural and theoretical differences of banks make them unique in the economy (Bhattacharya and Thakor, 1993; Diamond and Dybvig, 1983). The association between bank risk taking and corporate governance is an emerging field of the literature. For example, Stulz (2015) states that corporate governance mechanisms are essential to provide an optimal level of risk taking; the optimal level denotes that managers take risks to maximise the shareholder wealth without taking the social and economic responsibilities of default. The recent studies focus on the corporate mechanisms and executive characteristics and their connection to bank risk taking.

As a corporate governance mechanism, the board of directors has monitoring and advising functions (Burns et al., 2010). The recent studies investigate the functionality of boards by employing director-related demographic proxies. For example, Berger et al. (2014) examine the effect of demographics of directors (age, education level, and gender of the director) on bank risk taking. They employ portfolio risk as risk proxy and show that portfolio risk is positively related to younger directors on the board; there is also a positive relationship between portfolio risk and gender diversity of the board. Also, the findings of the study point out that the directors with doctorate decline the portfolio risk of the bank. Minton et al.'s (2014) study is another example of the studies that explore the connection between the demographics of directors and bank risk taking. The findings of the study indicate that the increased level of financial expertise of the directors on the board increases the risk, which is measured by the proxies for equity risk, leverage risk, and portfolio risk.

In the literature, executive incentive and its effect on excessive bank risk taking are another important topic. Hagendorff and Vallascas (2011) point out that CEO compensation is directly related to change in standard deviation of annual stock returns that increases default risk (Merton's distance-to-default) of banks. Additionally, the findings of DeYoung et al.'s (2013) study is in line with Hagendorff and Vallascas' (2011) study; higher CEO compensation increases the equity risk of the bank. In this manner, they concluded that higher CEO compensation also shifts the business model of commercial banks from traditional business activities to non-interest income generating business activities.

By setting up a different compensation measure, debt-based CEO compensation, Bennett et al. (2015) investigate the effect of CEO compensation on default risk (expected default frequency) of banks. The findings indicate that higher debt, which denotes the higher compensation of the CEO, declines the default risk during the crisis. The findings of Bennett et al.'s (2015) study is in line with the findings of Bekkum's (2016) study that employs debt-based CEO compensation, tail risk (value-at-risk, expected shortfall), and equity risk (stock volatility). By employing a similar equity risk proxy of Bekkum's (2016) study, Cheng et al. (2015) point out the positive relationship between CEO compensation and stock volatility as equity risk measure. Different than the other studies, Bolton et al. (2015) employ the announcement effect of credit default swap (CDS) spreads as a risk measure and show that risk measure is related to lower CDS spreads.

2.3. Bank risk taking and corporate governance structure in financial crises

The emerging empirical literature of banking industry states that good corporate governance practice of financial institutions are related to the better performance; the better performance of a bank can be measured by the higher stock returns and higher firm value (Andres and Vallelado, 2008; Caprio et al., 2007; Laeven and Levine, 2009). Also, excessive risk taking of a bank is related to the risk management (Aebi et al., 2012; Ellul and Yerramilli, 2013). The literature on the recent financial crisis shows that the effect of the risk management and the corporate governance structure of a bank on risk management and performance is different in the period of crisis (Aebi et al., 2012; Beltratti and Stulz, 2012; Fahlenbrach and Stulz, 2011).

In addition to the main function of corporate governance mechanisms to decline the interest gap between agents and principals, corporate governance mechanisms are employed to manage the excessive risk taking of firms in risk management setting. Recently, the findings of Aebi et al.'s (2012) study show that the standard corporate governance mechanisms are not considerably efficient due to decline in credit risk of banks. Specifically, the mechanisms do not improve the firm performance in a crisis.

Rather than the traditional corporate governance mechanisms, appointing chief risk officer (CRO) and establishing risk committees are innovative actions to improve risk management and performance of firms in recent years. In order to test this, by employing a sample of 372 US banks for the period of 2001 and 2010, Aebi et al.'s (2012) study explores the presence of a CRO who reports to the board of directors directly. The results show that the presence of CRO is positively associated with better performance and improves risk management of banks in crisis.

In addition to the studies that investigate the presence of CRO, recent studies also examine CEO incentives in financial crises. By employing a sample of 132 banks, Fahlenbrach and Stulz (2011) examine the effect of CEO incentives on bank performance during the recent financial crisis. In cases that shareholder interests align with the CEO incentives, banks have worse performance, and the estimation results do not provide evidence on better bank performance. Additionally, the CEO incentives that cover option-based compensation and direct compensation with more cash bonuses do not have negative effect on bank performance. The findings also show that the CEOs do not answer the anticipation of reducing the holdings. Contrary to the findings of Fahlenbrach and Stulz's (2011) study, Cooper and Kish (2014) find a positive and significant relationship between the CEO pay and pay-for-performance in the sample of 88 US banks for the period from 2001 to 2010. However, the relationship is weaker during the financial crisis.

In a cross-country sample of 164 large banks, Beltratti and Stulz (2012) investigate the different stock return performances of banks during the recent financial crisis. The results show that the fragility of banks, which have short-term capital market funding during the crisis, is higher than the banks that do not. The stock return performance of banks that have lower leverage before the crisis is better. On the other hand, there is no correlation

between the stock return performance of banks and country specific regulations during the crisis. Contrary to the argument that assumes the correlation between the poor corporate governance and worse stock return performance, the findings of the study indicate that banks with shareholder-friendly boards have worse stock return performance, decreased loans, and not less risky than other banks. Different than the findings of Beltratti and Stulz's (2012) study, Peni et al. (2013) show that banks with strong corporate governance mechanisms perform better by investigating profitability of banks and the relationship between corporate governance and real estate lending of banks during the financial crisis; the real estate loan losses of banks that hold strong corporate governance mechanisms is significantly lower than the banks with weak strong corporate governance mechanisms.

In another cross-country study that employs a sample 296 financial firms, Erkens et al. (2012) investigate the relationship between corporate governance structure and performance of financial firms during the recent financial crisis. The findings indicate that board independence and institutional ownership increase the worse stock return during the crisis. The plausible justification of these findings is related to the raised more equity capital at financial firms with more independent boards during the crisis. This is the reason of the transfer of wealth from shareholders to debtholders. Also, higher institutional ownership increases the excessive risk taking in the pre-crisis period. The findings also indicate that large shareholding has no significant effect on stock return during the crisis.

In European context, by employing a sample of European banks, Saghi-Zedek and Tarazi (2015) examine the effect of excessive control rights of shareholders, which is more than cash flow control rights, on bank performance, especially the effect during the recent financial crisis. In pre-crisis period, excessive control rights increase the earning volatility and default risk of the bank; it also declines the profitability. During the crisis, excessive control rights have a positive and significant effect on profitability; the effect of excessive control right of shareholders disappears on default risk. In addition, the findings assess that excessive control rights of shareholders trigger the default risk and decline profitability at family-controlled banks and in countries with weak shareholder protection environment.

In addition to the studies that employ performance proxies in order to measure the effect of the recent financial crisis and the relationship between corporate governance structure of banks and risk management, Ellul and Yerramilli (2013) employ Risk Management Index (RMI) in order test the strength and independence of risk management functions of large banks in the US. During the crisis, the default risk of a bank declines if RMI of a bank is high in the pre-crisis period. Additionally, there is positive and significant correlation between the pre-crisis RMI of a bank and stock return performance during the crisis. The similar results are obtained for the period of 1995 and 2010 that includes pre and post-crisis periods.

On the other hand, the literature provides examples of studies that compare the financial structure of the banks and corporate governance related proxies. In a recent study, Cools and Toor (2015) split the sample of US banks as weak and strong according to their endurance independently against the financial crisis and investigate the performances of weak and strong banks in financial crisis. Weak banks are grouped according to the information of bankruptcy, acquisition by other financial institutions due to financial distress, and fail at stress tests of regulators. On the other hand, strong banks are grouped according to information of recover as soon as possible after receiving government support and pass at stress tests of regulators. In these groups, the common corporate governance indicator is CEO duality that is compared to weak and strong banks. The results indicate some essential results. CEO duality is slightly lower at strong banks compared to weak banks. The financing of weak banks considerably depends on debt and they are less profitable compared to strong banks. The CEOs of weak banks receive more cash bonuses. Additionally, the magnitude of the negative stock return and value loss of weak banks are greater than those of strong banks.

2.4. Risk management and regulations: An international perspective

The efforts on establishing a promising risk management structure at firms take the stage at local and international level after the corporate scandals of the early 2000s. The revised version of OECD principles of Corporate Governance states that corporate strategy on risk management has an increasing importance (OECD, 2004, p. 60). After the releases of The Walker Report (2009) in the UK and the report of the Basel Committee (2010),

the report of Isaksson and Kirkpatrick (2009) for the OECD have revealed their guidelines to develop the corporate governance structure of banks according to the new dimensions of the risk management (Dermine, 2013). The main line of these reports is related to the effect of the recent financial crisis on financial institutions and the outcomes of the crisis on corporate governance of banks that have been failed on excessive risk taking.

The effect of bank regulations and the recent financial crisis on bank risk taking behaviour is also discussed in the literature. Laeven and Levine (2009) investigate the national bank regulators and their impact on banks' risk taking behaviour and ownership structure. They conclude that the bank risk taking behaviour in the period of crisis has had a massive impact on the financial and economic systems in all around the world and claim that the strong relationship between the corporate governance structure and risk taking behaviour of banks has not been studied enough in the literature to recommend an accurate mechanism to national and international regulators. Moreover, Solomon (2013) also argues the stress tests of corporate governance and risk management in the financial crisis; they conclude that the financial losses of stakeholders are greater than predictions because of the unobserved reasons related to corporate governance malfunctioning.

The efforts to define the importance of the banking system in the economy, decide on capital standards, risk measures, and benchmarks that apply to national banking systems, and close the gaps among national systems in international set up has had a long journey for the last four decades. In 1988, central banks of eight countries in addition to the central banks of G-10 countries held a meeting for banking regulations and discussed the standards that are almost entirely addressed to credit risk. In the same meeting, the Basel Committee on Banking Supervision (BCBS) has been formed for the purpose of regulating member states' banking industries. The committee prepares reports on corporate governance issues to guide their member countries since the first meeting.

In September 1999, the committee released the report "Enhancing Corporate Governance for Banking Organisations" (BIS, 1999). Mainly, the report has three dimensions. The first dimension of the report is on the importance of the corporate governance principles of the OECD. The second dimension is related to the concerns of the committee on current corporate governance issues that are mentioned in the previous reports. The third

dimension consists of the recommendations of the committee on these issues. The recommendations that BIS (1999, pp. 5–9) lists in:

- "Establishing strategic objectives and a set of corporate values that are communicated throughout the banking organization;
- Setting and enforcing clear lines of responsibility and accountability throughout the organization;
- Ensuring that board members are qualified for their positions, have a clear understanding of their positions, have a clear understanding of their role in corporate governance and are not subject to undue influence from management or outside concerns;
- Ensuring that there is appropriate oversight by senior management;
- Effectively utilizing the work conducted by internal and external auditors, in recognition of the important control function they provide;
- Ensuring that compensation approaches are consistent with the bank's ethical values, objectives, strategy and control environment;
- Conducting corporate governance in a transparent manner."

After that, in February 2006, the new version of the report was published. This was more detailed than the first version where some principles for sound corporate governance were stated in it. Moreover, the role of supervisors was presented, and some advice was provided to them in depth. Additional principles were introduced in October 2010. In this version, sound corporate governance principles declared for the board, senior management, risk management and internal control, compensation, corporate structures and disclosure and transparency separately. This version was revised and presented on October 2015 as "Corporate Governance Principles for Banks" as a consultative report issued for the comments of the members. As BIS (2015, p. 6) puts it:

> "In the light of ongoing developments in corporate governance, and to take account of the FSB peer review recommendations and other recent papers addressing corporate governance issues, the Committee has decided to revisit the 2010 guidance. One of the primary objectives of this revision is to explicitly

> reinforce the collective oversight and risk governance responsibilities of the board. Another important objective is to emphasise key components of risk governance such as risk culture, risk appetite and their relationship to a bank's risk capacity. The revised guidance also delineates the specific roles of the board, board risk committees, senior management and the control functions including the CRO and internal audit. Another key emphasis is strengthening banks' overall checks and balances."

In addition to those guidelines, since 1988, the committee has worked on some regulatory frameworks and declared them under the name of Basel accords. Since that time, Basel I and Basel II were effective after the release of the accords. The last one, Basel III on capital requirements, was declared in 2011 to be effective in the following years. The Basel Accords are some of the most influential agreements on financial institutions and has a significant effect on the international finance. Drafted in 1988 and 2004, Basel I and II have ushered in a new era of international banking cooperation. Through quantitative and technical benchmarks, both accords have helped to harmonise banking supervision, regulation, and capital adequacy standards across the eleven countries of the Basel Group and many other emerging market economies.

The very strength of both accords – their quantitative and technical focus – limits the understanding of these agreements within policy circles, causing them to be misinterpreted and misused in many of the world's political economies. Moreover, even when the Basel accords have been applied accurately and comprehensively, neither agreement has secured long-term stability within a country's banking sector (Balin, 2008). In order to harmonise the capital requirements of internationally active banks, in 1988 the Basel Committee released a Capital Accord (Basel I), which has subsequently been adopted by most banking supervisors. Basel I initially and specifically addressed only credit risk. Subsequently, market risk added into the pillars.

Basel II comprises three pillars. Pillar 1 is the minimum capital requirements for credit, market and operational risk. In Pillar 2, authorised deposit-taking institutions are required to demonstrate that they have capital targets consistent with their overall risk profile and current operating environment, with supervisors ensuring that the authorised deposit-

taking institutions have internal sound processes in place to assess the adequacy of their capitals. Pillar 3 provides enhanced market discipline through a disclosure regime in which the BCBS offers two risk measurement techniques to banks which are value-at-risk based internal and scandalised approaches. While these two approaches are theoretically right, the results show that the defects of Pillar 3 and different methods are suggested during market crises (Rossignolo et al., 2013). Basel II's focus was to establish an international standard that banking regulators can use when creating regulations about how many capital banks need to reserve to cover for credit and operational risks (Egan, 2007).

After the releases of Basels I, II, and III, the studies are shown up in the literature to evaluate the effects of the releases and recommended regulations on the corporate governance and risk management of the banking institutions in the member states. Drumond (2009) focuses on business cycle fluctuations and Basel II agreements analysis. He argues that this agreement supports the procyclicality hypothesis and the recent financial crisis would lead political institutions to add this issue to their agenda. On the other hand, Dedu and Nechif (2010) analyse the credit risk and its management under the light of Basel II agreement and focus on specifically on Pillar 1 and its implications on minimum capital requirements for credit risk of banks. According to Awojobi (2011), although Basel II accord is open to being criticised for its inadequacy in defining what constitutes a bank's capital, it extensively provides a basis for risk management in banks. A central focus of the Basel guide is on capital adequacy as a cushioning mechanism for risk exposure of bank assets. Rossignolo et al. (2013) studies on market crises and capital requirements Basel III relation where they specifically focus on the four EU member countries (Portugal, Ireland, Greece and Spain) and they show that Basel III brings important rules to strengthen capital requirements for banking operations in order to reduce impact and possibility of a systemic crisis.

3. Methodology and Data

3.1. Data selection process

In order to construct the dataset that is used for the estimations, SNL Financial, FED call reports, Thomson One Analytics' Worldscope, Bloomberg, and BoardEx databases are used. The first information of the list of banks with standard classification of 6021 and 6022 is gathered from SNL Financial database on more than 3,000 US banking institutions. The list is constructed by including the acquired and delisted banks for the period of eighteen years from 1998 to 2015. In order to measure the systematic and systemic risks of banks, unlisted banks headquartered in the US (as of 31st of December, 2015) are removed from the sample. Additionally, the acquired and delisted banks are included in the sample for the given period.[12]

The CEO power variables (CEO tenure and CEO network size), CEO and board related variables (CEO age, gender, education, and experience, board size, independence, tenure, and network size) are collected from BoardEx. Bank specific information (liquidity, leverage, loan loss provisions, capital asset ratio, cost-to-income ratio, return on assets, and size) is gathered from FED call reports and SNL Financial. In order to calculate the systematic and systemic risk variables, daily stock prices of the banks in the sample are collected from Bloomberg. Additionally, the ownership related variables are collected from Thomson One Analytics' Worldscope. By following Aggarwal et al. (2015), the investor information of banks for each year is assessed and grouped. The final dataset includes 908 publicly listed US banks.

3.2. Methodology and variable description

In this study, multiple risk proxies (Z-score, systematic risk, and systemic risk) are employed to measure the effect of network size of the CEO and the effect of tenure of the CEO on bank risk taking. In general setting, the research question is 'Does corporate governance structure of banks affect risk taking?' In the literature, the relation between risk taking of firms and different corporate governance mechanisms, which are design to

[12] The list of delisted banks and delisting dates is provided in Appendix B, Table 20.

deal with the principal-agent problem, such as board structure & board characteristics (e.g., Berger et al., 2014; Ferrero-Ferrero et al., 2012; Minton et al., 2014; Pathan, 2009) and investor protection & ownership structure (e.g., Laeven and Levine, 2009; Pathan, 2009; Saunders et al., 1990; Wright et al., 1996) are investigated. Also, the literature investigates the risk taking of firms and CEO related proxies such as CEO characteristics that include age, gender, education (e.g., Acrey et al., 2011; Adhikari and Agrawal, 2016; Buyl et al., 2017; Cain and McKeon, 2016; Faccio et al., 2016; Pathan, 2009; Serfling, 2014) and CEO incentive and compensation (Coles et al., 2006; Gray and Cannella, 1997; Hagendorff and Vallascas, 2011; Neacsu et al., 2014).

The first research question of this study is 'Does tenure of the CEO affect the bank risk taking?' In this setting, the CEO tenure denotes the number of years the CEO has served in the same position. In this study, it is assumed that there is a relationship between the tenure of the CEO and bank risk taking; this assumption takes the presence of moral hazard problem in banks into consideration. The clear reason of moral hazard, which arises after the establishment of a contract, is the unsatisfied terms and requirements of the contract in a firm. In bank risk taking context, the moral hazard problem is exemplified with the shareholders and executives' purpose to transfer the risk to the central banks that are defined as the lenders of the last resort (Drechsler et al., 2016). In this manner, shareholders and professional managers might take more risk by using the presence of deposit insurance in the banking system (Dam and Koetter, 2012). In the literature, the 'visible' incentives of professional managers such as compensation on risk taking are studied broadly (e.g., Chakraborty et al., 2007; Gormley et al., 2013; Guay, 1999). On the other hand, the 'invisible' incentives of them that reflect the career concerns are also investigated in the literature. Nevertheless some empirical studies investigate the association between career concerns of executives and risk taking (Chen, 2015; Fu and Li, 2014; Hermalin, 1993; Holmström, 1999) and some of them suggest that longer tenure is the reason of decreased career concerns (Hill and Phan, 1991; Milbourn, 2003; Yudan Zheng, 2010). In these studies, the professional manager tenure is employed as a proxy to measure the career concern; the assumption is that newly appointed managers have more concerns on their careers than longer tenure executives have. In this study, it is assumed that: (i) the CEO can gain more experience when he holds the same positions

for a longer period compared to newly appointed ones who potentially have career concerns; (ii) longer tenure of the CEO can trigger the moral hazard problem that is one of the reasons of excessive risk taking. The potential reason of this relation is the lowered career concern of the longer tenured CEO. Thus, the research question is hypothesised as 'longer tenure of the CEO increases bank risk taking'.

The second research question of this study is 'Does network size of the CEO affect the bank risk taking?' In this research question, the CEO network size is the number of network nodes of the CEO. The definition of the network from Jackson's (2010) study refers to a set of nodes and links that represent the relationship between nodes; the link is the transmitter that enables the flow of information among nodes to establish the communication. The network is also able to reorganise and imitate the resources in order to transfer information (Hong et al., 2005). Correspondingly, the functionality of a network is not only flow of information but also the capability of changing the structure of the information (Brass et al., 2004). Under these conditions, networks provide different access points for the same node at interchangeable environments and generate information advantage for individuals (Madhavan et al., 1998). In the literature, it is documented that CEO network allows CEO to access to relevant information (Faleye et al., 2014). In the case of information asymmetry, professional managers and board members can make unwise decisions (Banker et al., 2012). Moreover, the decision of them with information asymmetry might collapse the market (Oyer and Schaefer, 2010). By using his broader network, the CEO might benefit from the information advantage he has and might increase the information asymmetry among other components of the business by exacerbating the adverse selection problem that is one of the reasons of excessive risk taking. The reason of this assumed relationship is the overloaded self-confidence of the CEO in risk taking decision. Thus, the research question is hypothesised as 'larger network sizes of the CEO increases bank risk taking'.

In the dataset, the data of 908 publicly listed US banks are gathered. The dataset is in panel data set up that provides the constant magnitude of cross section dimension and time series dimension. In multivariate analysis of this study, the model is employed to measure the effects of tenure and network size of the CEO to explain the variances of three bank risk measures by controlling CEO characteristics, board characteristics, bank

characteristics, ownership structure, and the effect of the recent financial crisis. Panel fixed effects estimation is commonly suggested in the presence of unobserved bank fixed-effects (for details, see Wooldridge, 2002, pp. 265–291). By following Bhagat et al. (2015), panel fixed effects estimation technique is employed to measure the variances of risk taking proxies after employing Hausman test to decide the fixed and random effects estimations. A Hausman test tests whether random effects estimation would be almost as good in a given model and data in which fixed effects estimation would be appropriate. In case of fixed effects, the Hausman test is a test of H0: random effect would be consistent and efficient, versus H1: random effects would be inconsistent (for details, see Wooldridge, 2002). Appendix C, Table 9 clearly states that fixed effect estimations is proper to be employed in the estimations of the study; chi2 values of each Hausman test of different risk proxies are significant at 99 percent confidence interval. In estimations, there are three risk proxies (Z-score, systematic risk, and systemic risk) are employed.[13]

By following Laeven and Levine (2009), Z-score of each bank, which denotes the measure of distance from the solvency, is calculated and employed as the first risk measure. Roy (1952) defines that insolvency is the status of where the losses of the entity are greater than the equity of the entity; the condition is characterised by E (equity of the entity) and $-\pi$ (losses of the entity) and states that $E<-\pi$. In this setting, the probability of insolvency is expressed as the condition in where the probability of capital asset ratio is greater than the probability of negative return on assets. If the probability of insolvency is normally distributed, Z-score (inverse of the probability of insolvency) equals to the return on assets plus capital asset ratio divided by standard deviation of return on assets. In this form that is recommended by Roy (1952), a higher Z-score denotes that bank is more stable. In this study, the inverse of Z-score for each bank is calculated to mention the higher Z-score to point out the higher risk.

The second risk measure is the systematic risk in this study. By following the suggestions of Anderson and Fraser (2000) and Chen et al. (2006), the two-index market model is

[13] Hausman test results of CEO power sample are provided in Appendix C, Table 21.

employed to calculate the systematic risk of each bank and constructed by using a simple capital asset pricing model (CAPM).[14] The model is estimated as follows;

$$R_{B,id} = \beta_0 + \beta_1 R_{M,d} + \beta_2 int_t + \varepsilon_{it} \quad (1)$$

where, $R_{B,id}$ is the equity return of bank i in trading day d; $R_{M,t}$ is the return of S&P 500 index in trading day d; *int* is the yield on the three-month Treasury bill rate in trading day d; β_0 is the intercept; β_1 is the systematic risk of bank i in trading day d; and β_2 is the interest rate risk. For each bank, the systematic component (β_1) is calculated on daily data by estimating the individual regressions in given time period.[15] The systematic risk variable is constructed by collecting and calculating the average value of β_1 of each bank in the sample.[16]

The systemic risk is employed as the third risk measure in this study. In the literature, some recent studies use the asset structure of financial institutions to assess the systemic risk that they take (e.g., Gray et al., 2007; Lehar, 2005). This approach has some difficulties because of using strong assumptions that take the liability structure of a bank into consideration. On the other hand, the market data provides a new field for researchers to measure the systemic risk. By employing a simple approach of taking the whole

[14] There are several assumptions of CAPM that are essential to establish the model. These assumptions are as follows:
Assumption I: Security markets are perfectly competitive. There are many small investors are active in security market. On the other hand, investors are price takers.
Assumption II: Markets are frictionless. It is assumed that there are no taxes and transaction costs in the markets.
Assumption III: Investors are myopic, in which all investors have only one and the same holding period.
Assumption IV: Investments are limited to publicly traded assets with unlimited borrowing and lending at risk-free rate. Assets such as human capital are not part of the investment opportunities.
Assumption V: Investors that cover individual and institutional investors are rational mean-variance optimizers, in which investors use the Markowitz portfolio selection method.
Assumption VI: All investors have access to the same information and analyse the information in the same manner.
Assumption VII: Everyone either has quadratic utility or has homogenous beliefs concerning the distribution of security returns.
[15] The dependant variable of the estimations for systematic risk is the estimated coefficient of the return of the S&P500 in daily basis. It is taken into consideration that if the sampling uncertainty in the dependant variable is not constant across observations, the regression errors will be heteroscedastic and the estimations will introduce further inefficiency and may produce inconsistent standard errors. The heteroscedasticity of the first model is checked to avoid the concerns mentioned above.
[16] By employing CAPM, the beta is calculated to measure the systematic risk of a bank in given time period. It is noted that the asymmetric information that is the essential part of the principal-agent problem violates the perfect information assumption of CAPM.

financial sector components as a portfolio of the sector, Basurto et al, (2009) use the credit default swap (CDS) information of each financial firms to measure the effect of each firm on the overall potential distress. In addition to the CDS of the financial firms, Huang et al. (2009) employ stock return correlations in order to estimate the expected credit losses. On the other hand, De Jonghe (2010) estimates the beta tail as systemic risk measure by using the dataset of European financial institutions.

Recently, one of the most important concerns of the financial institutions on risk management is the allocation of overall risk; a bank tends to investigate the effect and cost of each transaction on capital requirements. At the macro level, bank regulator needs to employ a methodology to decide the capital requirements of each bank according to their individual effects on systemic risk. On allocation problem, different risk measures provide indirect information in which the information is related to the sensitivity of risk measure and risk components. For instance, 'Euler Rule' allocates total risk according to the marginal effects of each components of total risk. On the other hand, euler rule only employs gâteaux derivatives that efficient work at only simple cases in order to allocate total risk. Additionally, euler rule only takes the marginal effect of a single component in whole model rather than each individual component in the model. To sum, the allocation of euler rule is not efficient (Tasche, 2008). In a recent study, Kromer et al. (2016) define systemic risk as a univariate risk measure in decomposition and aggregation functions. Overall, systemic risk points out the default risk of an entity that is highly related to the markets. Measuring the systemic risk provides the strong insight of the risk tolerance of entities in overall economy.

In addition to the theoretical discussions of systemic risk, the discussions on the implication of systemic risk measure have become essential especially after the recent financial crisis; there is a visible difference between the theoretical assumptions of systemic risk assessment methods and real-life implications. The clear example of this difference is the theoretical and practical differences of institutional-level value-at-risk (VaR) approach to measure the systematic risk. Institutional-level VaR approach is strict on employing the regulator-related total risk rather than any risk measure that reflects the individual institutions (Saunders and Allen, 2010).

The recent theoretical work of Acharya et al. (2017) requires only two assumptions to measure the systemic risk. These assumptions are: (i) undercapitalization of the institutions is an externality for the rest of the economy that is spilt over (Acharya et al., 2010), and (ii) failing of a bank imposes costs on creditors and bailouts (Rochet and Tirole, 1996). These assumptions allow the interpretation of banks' decision on how much capital they raise and which risk profile they choose due to maximising risk-adjusted return. On the other side, regulators can monitor the whole banking system by interpreting the adjusted outcomes of the actions of banks and externalities arise in systemic crises.

Acharya et al. (2017) propose two components of systemic risk in expected shortfall setting.[17] The Systemic Expected Shortfall (SES) is the expected amount of shortfall when the bank is undercapitalized in the overall undercapitalized market. Under this condition, SES denotes the triggered undercapitalization effect on the bank in financial crisis. In order to measure SES, Marginal Expected Shortfall (MES) is employed for each bank. By using daily stock return, MES is estimated at a standard risk level of 5 percent. The standard risk level indicates the 5 percent worst days for the market return in given year. MES is calculated as follows;

$$MES_i^{5\%} = {}^{1}/_{\#\ days} \sum_{t:system\ is\ in\ its\ 5\%\ tail} R_i \tag{2}$$

where $MES_i^{5\%}$ is the marginal expected shortfall of bank i in 5 percent worst days; $\#\ days$ is the number of 5 percent worst days in the market; R_i is the average return of bank i in 5 percent worst days. The economic interpretation of the MES provides the systemic risk of an individual bank that are related to the default of the entire system. In this study, MES that indicates the expected shortfall of individual banks in worst days is employed as systemic risk proxy.

[17] Expected shortfall is a measure related to market risk of a portfolio. 'Expected shortfall at X percent level' denotes the expected return of portfolio in worst X percent of cases in the market.

3.2.1. Model

The model of this study analyses the effect of CEO power (the tenure and network size of the CEO) on the risk of publicly listed US banks by employing Z-score, systematic risk and systemic risk as risk indicators. The model is estimated as follows;

$$
\begin{aligned}
Risk\ proxy_{\ i,t} = {} & \beta_0 + \beta_1\ CEO\ tenure_{\ i,t} + \beta_2\ CEO\ network\ size_{\ i,t} + \beta_3\ CEO\ Age_{\ i,t} \\
& + \beta_4\ CEO\ Gender_{\ i,t} + \beta_5\ CEO\ Experience_{\ i,t} + \beta_6\ CEO\ Education_{\ i,t} \\
& + \beta_7\ Board\ Size_{\ i,t} + \beta_8\ Board\ Independence_{\ i,t} + \beta_9\ Liquidity_{\ i,t} \\
& + \beta_{10}\ Leverage_{\ i,t} + \beta_{11}\ Loan\ Provision_{\ i,t} + \beta_{12}\ Capital - Asset\ Ratio_{\ i,t} \\
& + \beta_{13}\ Cost - to - Income_{\ i,t} + \beta_{14}\ ROA_{\ i,t} + \beta_{15}\ Size_{\ i,t} \\
& + \beta_{16}\ Institutional\ Investment_{\ i,t} + \beta_{17}\ Individual\ Investment_{\ i,t} \\
& + \beta_{18}\ HH - Index_{\ i,t} + \beta_{19}\ Financial\ Crisis\ Dummy_{\ i,t} + \varepsilon
\end{aligned}
$$

where;

- Risk proxy: Z-score, systematic risk, and systemic risk
  - Z-score (inverse of the probability of insolvency): Return on assets plus capital asset ratio divided by total by the standard deviation of return on assets at given year.
  - Systematic Risk: Coefficient of the return of S&P 500 index in the estimation of the two-index market model at given year.
  - Systemic Risk: Marginal expected shortfall in 5 percent worst days at given year.
- CEO Tenure: Number of years the CEO has served in a position at given year (natural log).
- CEO Network Size: Network size of the CEO at given year (natural log).
- CEO Age: Age of CEO at given year (natural log).
- CEO Gender: Binary variable that is 1 if the CEO is female, otherwise 0 at given year.
- CEO Experience: Number of years the CEO has served in any capacity in the same bank at given year (natural log).

- CEO Education: Binary variable that is 1 if the CEO holds at least post-graduate level diploma, otherwise 0 at given year.
- Board Size: Number of directors sitting on the board at given year.
- Board Independence: the percentage of independent non-executive directors on the board at given year.
- Liquidity: Ratio of liquid assets to total assets ratio at given year.
- Leverage: Total book value of liabilities to total assets ratio at given year.
- Loan Provision: Loan loss provision to total loans ratio at given year.
- Capital-Asset Ratio: Capital to risk-weighted total assets ratio at given year.
- Cost-to-Income: Operating expenses to total operating income ratio at given year.
- ROA: Return on Assets (Earnings before interest and taxes (EBIT) to book value of total assets ratio) at given year.
- Size: Total assets of the banks at given year.
- Institutional Ownership: Total ownership percentages of financial institutions at given year.
- Individual Ownership: Total ownership percentages of individuals at given year.
- HH-Index: Herfindahl-Hirschman Index in which the total of squares of the ownership percentages of each investor at given year.
- Financial Crisis Dummy: Binary variable that is 1 in financial crisis years (between 2008 and 2010), otherwise 0 at given years.

3.2.2. Variable descriptions

The motivation for the choice of each proxy is as follows;

CEO Tenure is employed to measure the effect of CEO tenure on bank risk proxies in aforementioned model. In this setting, CEO tenure is the number of years the CEO has served in the position. The literature on risk taking provides a broad range of studies with different outcomes.[18] Bloom and Milkovich (1998) and Serfling (2014) document that

[18] The relation between CEO tenure and risk raking is an emerging field in the literature (e.g., Cain and McKeon, 2016; Chakraborty et al., 2007; Coles et al., 2006; Hirshleifer et al., 2012; Serfling, 2014; Simsek, 2007).

there is a positive relation between CEO tenure and risk taking. On the other hand, Coles et al. (2006) and Chakraborty et al. (2007) detect negative relation in which Muscarella and Zhao (2015) and Ryan and Wang (2012) document that there is no connection between CEO tenure and risk taking. In this study, the CEO tenure is assumed as a tool to measure the career concerns of the CEO. The recent studies show that executive managers are risk averse in their early careers (Chen, 2015; Fu and Li, 2014). In addition to the effect of CEO tenure, board members and other professional managers also have an impact on firm decision-making processes that include the transactions related to risk taking (Westphal and Zajac, 1995). Moreover, Vafeas (2003) specifically points out that longer tenure of board members indicate the important understandings of board members on firm policies and strategies. In this study, it is assumed that CEOs take more risk if they have longer tenures. Therefore the predicted sign of the relationship is positive.

CEO Network Size is employed to measure the effect of this network size measure on risk proxies in the model. CEO Network Size is the number of network nodes of the CEO, which consists of employment, education, and social connections. The information advantage might cause a risky decision of a professional manager (Banker et al., 2012). Faleye et al. (2014) document that the CEO network allows the CEO to access to relevant information. Also, Westphal et al. (2001) point out that the network ties of senior executives have a significant effect on imitating corporate decision-making processes to adapt the firm to the environment. It is assumed that the information advantage of the CEOs might allow them to benefit against other counterparts who suffer from information asymmetry and might increases excessive risk taking. Therefore, the expected sign of the relationship is positive.

CEO Age is employed to control one of the CEO characteristics in estimations of the model. There is an emerging literature on executives' age and risk taking in the last decade. Bucciol and Miniaci (2010) and Grable et al. (2011) document the decline in risk tolerance with increased age. On the other hand, Agarwal et al. (2010) detect a negative relationship between age and risk taking by providing evidence that employ experience of older managers compared to younger colleagues. In a recent study, Serfling (2014) point out the negative relation between CEO age and stock return volatility. Thus the expected sign of the relationship is negative.

CEO Gender is a binary variable, which equals to 1 if the CEO is female, is employed to control the gender diversity in estimations of the model. The economic effect of gender diversity is growing in the literature (Croson and Gneezy, 2009). The general tendency in the literature is related to the risk aversion of women (e.g., Agnew et al., 2003; Barsky et al., 1997; Sundén and Surette, 1998). Additionally, Ford and Richardson (2013) argue that women are more insist on ethical values. In the context of firm risk taking and gender diversity, the literature contains mixed results. The findings of Almazan and Suarez (2003) document the negative relation between risk taking and the presence of female bank managers. The findings of Farrell and Hersch's (2005) work that show the opposite direction of the relationship between female executives and risk taking is in line with Almazan and Suarez (2003). Adams and Funk (2011) document that female managers are more risk lover than male managers. In a recent study, Faccio et al. (2016) document that firms with female CEOs take less risk. Thus either a positive or negative sign of the relationship is expected.

CEO Experience is the number of years the CEO served in any capacity in the same bank. The variable is employed to control the whole time of the CEO in the bank. Difference than tenure, CEO experience emphasises the total time that the professional manager spent in any capacity in the same organisation. The potential relationship between the corporate values of an organisation and the transactions of professional managers might be affected by the time that the professional manager spent at lower capacities of the organisation. The direction of the relation is a point that is not answered in the literature. Thus either a positive and negative sign of Experience is predicted in the model.

CEO Education is a binary variable that equals to 1 if the CEO holds at least post-graduate level diploma. The purpose of employing CEO Education variable is to control the effect of education of the CEO on bank risk taking. The study of Carducci and Wong (1998) is one of the examples of the literature that links business and psychology; they point out that higher education increases individuals risk taking in financial decisions. In a similar vein, Grable (2000) provides the conclusion that risk taking of individual increases with higher education. Despite the fact that Bucciol and Miniaci (2010) find no evidence of a relationship between education level and risk taking, Bertrand and Schoar (2003) point out that managers with MBA degree are more aggressive and tend to be appointed at firms

that engage riskier policies. Therefore, the expected sign of the relationship is positive in the model.

Board Size that is the number of directors sitting on the board is employed in estimations of the model to control the effect of board size on risk taking. The early studies in the literature on the decision making and group size indicates that there is a negative relationship between the size of the group and risk taking (Kogan and Wallach, 1964; Moscovici and Zavalloni, 1969). In a similar vein, Sah and Stiglitz (1991) argue that deciding on riskier projects is less likely to be accepted in larger groups. Despite the studies that advocate the positive effect of smaller board size on firm performance (Yermack, 1996), in a recent study, Baer et al. (2005) show that the fluctuation of the management team's investment decision from the optimum is less than that of the single manager's investment decision in mutual funds. Correspondingly, Adams and Ferreira (2010) discuss the less extreme decisions of larger groups in betting. By employing a sample of non-financial US firms for the period of 1996 and 2004, Cheng (2008) shows that increased board size declines the volatility of monthly stock return and annual assets return. In a similar sample setting, Wang (2012) documents that different risk measures are negatively related to board size. Thus, the predicted coefficient sign of Board Size is negative in estimations for the risk proxies.

Board Independence, which is the percentage of independent non-executive directors on the board, is employed to control the effect of board independence on bank risk taking. As a corporate governance mechanism, board independence has a function to increase the efficiency of monitoring on behalf of the needs of shareholders (Fama and Jensen, 1983). In theory, independence is a way to make sure that board members fully comply with the shareholders' incentives. On the other hand, Bebchuk et al. (2009) posit that functionality of board independence might be deteriorated if independent board members are entrenched in serving managers rather than shareholders. The potential reason for the shift in the interest of independent board members might be related to the country-level regulations that promote weak corporate governance practices and the malfunctioning at nomination and remuneration committees. Despite these potential drawbacks of board independence, Bhagat and Black (2002) point out the non-correlation between board independence and managerial decision in the US sample. By employing a sample from

the US banking industry, Pathan (2009) documents that there is a negative relationship between board independence and different risk measures and argues that board independence increases the monitoring function because of the regulatory compliance of independent board members and professional managers (and another type of board members) act more conservatively in the course of monitoring of independent board members. In this study, the definition of board independence refers to outside board of director membership (denotes to be appointed from outside with no visible connection with managers) and non-executive board of director membership (denotes no executive role within the bank) in which board independence is fully constructed. Therefore, the expected sign of the relationship is negative.

Liquidity that denotes the ratio of liquid assets to total assets ratio is employed to control the liquidity of banks in estimations of the model. The findings of theoretical and empirical studies provide mixed results in the direction of the relationship between bank liquidity and risk. One of the main function of the banking industry is changing the maturity of funds (Levine et al., 2000). By violating this function, failing to meet the short-term financing demands increases bank risk regarding liquidity. In a theoretical study that aims to point out this fail and measure the effect of interbank credit lines, Freixas et al. (2000) argue the uncertainty in consumers' behaviour that increases the liquidity needs of banks and the interbank credit lines that allow banks to stay in stable against the fluctuations in liquidity needs. This theoretical approach is consistent in an industry that consists of solvent banks. They point out that an insolvent bank with liquidity shortage has potential to create a chain reaction in the whole system in which banks face higher systemic risk. On the other hand, the literature also provides studies that show the position association and risk. For example, Myers and Rajan (1998) point out that access to liquidity leads financial firms to take more risk. Additionally, the findings of a theoretical study of Acharya and Naqvi (2012) show the trigger effect of liquidity on the risk that creates stock price bubble in the market. Under these conditions, the predicted relationship between bank liquidity and risk is decided by using the findings of an empirical study of Altunbas et al. (2010). By employing a sample of European and US bank for the period of 1998 and 2008, Altunbas et al. (2010) show that lower degree

of liquidity is consistent with higher risk of banks in the sample. Therefore, the predicted signs of the coefficient of liquidity are negative in estimations.

Leverage is the total book value of liabilities to total assets ratio. The findings of Nicolo et al.'s (2010) study show that bank leverage is an indicator to investigate the relation between monetary policy and bank risk taking. In a similar vein, Dell'Ariccia et al. (2010) indicate the positive relation between excessive risk taking and higher leverage in the financial crisis. On the other hand, the theoretical study of Dell'Ariccia et al. (2014) assesses that highly leveraged banks decrease risk if loan demand is linear. In an empirical study, Demsetz et al. (1997) show that the relation between bank leverage and equity risk is significant and negative. Therefore, the expected sign of the relationship is negative.

Loan Provision that is the ratio of loan loss provision to total loans is employed to control the asset quality of banks. The bank accounting related literature focuses on loan loss provision in order to understand the valuation and risk relevance of banks (Barth et al., 2001; Beatty and Liao, 2011; Bushman and Williams, 2015, 2012). Sinkey and Greenawalt (1991) define the mechanism between loan loss provision and risk taking; it is identified that increased loan loss provision makes the funds volatile and increases risk. Hence the predicted relationship between Loan Provision and risk proxies is positive.

Capital-Asset Ratio is risk-weighted capital to total assets ratio and is employed to control the capital structure of banks in estimations. Calem and Rob (1999) document that there is a negative relationship between risk and bank capital; they point out that incentives to increase asset risk decline when bank capital increases. Also, Altunbas et al. (2010) show that lower degree of capitalization at riskier European and US banks. In a recent study, Berger et al. (2014b) detect the negative and significant relation between risk proxies and related variable. Therefore, the anticipated sign of the relationship is negative.

Cost-to-Income Ratio, which is operating expenses to total operating income ratio, is employed as a bank efficiency control (Hess and Francis, 2004). Either positive or negative relationships are predicted between Cost-to-Income Ratio and risk proxies in the model.

ROA, which is the earnings before interest and taxes to book value of total assets ratio, is employed to control the profitability in estimations. The findings of Faccio et al.'s (2011) study on non-financial firms show that there is a negative and significant relationship between risk proxies and ROA. Delis and Kouretas (2011) provide mixed results in estimations of interest rate and bank risk taking. On the other hand, the profitability has an insignificant effect on European bank risk taking. García-Marco and Robles-Fernández (2008) document the negative relation between the risk taking and turnover in cases of poor profitability of Spanish banks. In cross-country study of more than 2400 banks from 69 countries, Houston et al. (2010) relate higher bank profitability and lower bank risk in greater information sharing environment. Therefore, the expected sign of the coefficient of ROA is negative.

Size that is natural logarithm of total assets is employed to control the size of banks on risk taking behaviour. The literature suggests that size is an important indicator of bank's risk (e.g., Drehmann and Tarashev, 2011; Huang et al., 2012; Tarashev et al., 2009). Compared to smaller banks, larger banks face with 'too-big-to-fail' problem (Demirgüç-Kunt and Huizinga, 2013) and suffer from the inefficiencies that come from their internal mechanisms (Stein, 1997); these effects could make them riskier. In a recent study on US financial institutions for the period of 2002 and 2012, Bhagat et al. (2015) report the positive relation between size and risk in pre-crisis and crisis period; there is no similar relationship in post-crisis period. Hence the predicted sign of the coefficient of size is positive in this study.

Institutional Investment is employed to control the institutional ownership structure on bank risk taking. The literature on the relationship between risk proxies and institutional ownership provide mixed results. The plausible justification of this might be related to employing different risk measures for various time periods. For instance, O'Brien and Bhushan (1990) point out the negative and significant relationship between systematic risk and institutional ownership in US sample of non-financial firms. The findings of Knopf and Teall (1996) indicate the negative relationship between insolvency risk of thrift institutions and institutional ownership. Cheng et al. (2011) discuss the association between risk taking and ownership structure in US life-health insurance firms; the findings indicate that there is no significant relation. In cross-country analysis of banking

industry, Forssbæck (2011) finds a negative relationship between institutional ownership and bank risk taking. In the European context, Barry et al. (2011) document that institutional ownership significantly increases insolvency risk in privately owned European banks; the relation disappears in publicly listed European banks. On the other hand, the literature on the relationship between systematic risk and institutional ownership indicates the positive relation (e.g., Baker and Haugen, 2012; Brown and Brooke, 1993; Koch et al., 2016; Trueman, 1988; Xu and Malkiel, 2003). Therefore the predicted relationship between Institutional Ownership and risk measures (Z score and systemic risk) is either negative or positive; the anticipated relationship between institutional ownership and systematic risk is positive.

Individual Investment denotes the total ownership percentages of individual investors. According to Erkens et al. (2012), ownership structure matters in risk taking behaviour of banks. The increase in the number of individual investor and the increased total percentage of ownership by individual investors indicate the dispersed ownership and have a negative effect of bank risk taking (Laeven and Levine, 2009). The predicted relationship between individual investment and risk proxies is negative.

HH-Index is used as an ownership concentration measure in which it denotes the total of squares of the ownership percentages of each investor. A higher HH-Index indicates block holding of shares; a lower HH-Index indicates dispersed ownership. The advantage of the HH-Index compared to other concentration measures is to take the distribution of ownership into account (Edwards and Weichenrieder, 2004). Iannotta et al. (2007) show that insolvency risk of European banks declines with higher ownership concentration and the findings is in line with the results of Laeven and Levine's (2009) work, which states that diversified ownership increases risk taking in the banking industry. García-Marco and Robles-Fernández (2008) find no significant relationship between ownership concentration and risk taking behaviour of Spanish banks. On the other hand, by employing a sample of banks that are selected from the US and 134 countries, De Nicolo et al. (2006) point out that there is a positive and significant relationship between the risk measure of banks (Z-score) and HH-Index; the concentrated ownership is associated with greater risk. The agency theory assumes that executive managers govern firms on behalf of shareholders' needs. If the shareholding is concentrated, shareholders, whom most of

the shares in their hands can lead the firm to be managed according to their needs. Moreover, the needs of shareholders might be the reason of excessive risk taking. On the other hand, each shareholder has a substantial equity stake under the conditions of diversified ownership, and different expectations of shareholders might increase the risk taking of the bank. Thus, either a positive or negative relationship is expected between HH-Index and risk proxies.

Financial Crisis Dummy that is a binary variable equals to 1 in years of financial crisis is employed to control the potential effect of the recent financial crisis between 2008 and 2010 in estimations (Ivashina and Scharfstein, 2010).

4. Descriptive Statistics

In this section, the descriptive statistics of the variables that are employed in multivariate analysis are investigated.

Table 13 reports the descriptive statistics of bank risk proxies (Z-score, Systematic Risk, and Systemic Risk), CEO power variables (CEO Tenure and CEO Network Size), CEO related variables (CEO Age, CEO Gender, CEO Experience, and CEO Education), board related variables (Board Size and Board Independence), bank specific variables (Liquidity, Leverage, Loan Provisions, Capital-Asset Ratio, Cost-to-Income, ROA, and Size), ownership related variables (Institutional Investment, Individual Investment, and HH-Index), and the recent financial crisis related variable (Financial Crisis Dummy).[19]

The mean (median) of Z-score, Systematic Risk, and Systemic Risk are 23.54, 0.485, and -1.24 (17.06, 0.324, and -0.72) respectively. In Japanese bank sample for the period of 1990 and 1999, Konishi and Yasuda (2004) calculate the average Z-score as 14.64. The average Z-score in this study (23.54) is higher than the average Z-score in Laeven and Levine's (2009) study (2.88). The plausible explanation of this difference is the scope of these two studies; despite the fact that the average Z-score of the publicly listed US banks for the period of 1998 and 2015 is calculated in this study, Laeven and Levine (2009)

[19] Correlation matrix of selected variables is provided in Appendix F, Table 28.

employ a cross country bank sample for the period of 1996 and 2001. For a sample of 300 US bank holding companies for the period of 1997 and 2004, Pathan (2009) finds out a relatively close average Z-score (19.74). The average systematic risk of this study is lower than the average systematic risk of Altunbas et al.'s (2011) study, which is 0.7. The potential reasons for this difference are the different time periods that these two studies focus and the sample of cross country banks in Altunbas et al. (2011) study. By employing a sample that covers US banks and venture capitals, Brunnermeier et al. (2012) calculate the average systemic risk is -3.35 and lower than the average systemic risk of this study. On the other side, the findings of Acharya et al.'s (2017) recent study shows that the average systemic risk is -1.63 and close to the findings of this study.

Table 13: Descriptive statistics of the sample

This table provides descriptive statistics of the variables that are employed in multivariate analyses. Unless stated otherwise, descriptive statistics are derived from the average values calculated on the basis of annual data. Systematic Risk and Systemic Risk are calculated and annualised from the daily stock return values for each bank. CEO Network Size and CEO Tenure is calculated from the values for each CEO at banks. Executive Network Size and Executive Tenure are calculated from the average values of network size and tenure of board members and CEOs at each bank. Board related variables, bank-specific variables, and ownership related variables are calculated from the average values for each bank. Sample period is from 1998 to 2015

Variables	N	Mean	Median	Std. dev.	p25	p75	Min	Max
Z score	6066	23.54	17.06	23.751	6.287	32.42	-3.615	236.4
Systematic Risk	6066	0.485	0.324	0.796	0	0.955	-21.56	13.19
Systemic Risk	6066	-1.24	-0.72	3.163	-2.23	0.010	-20.01	20.01
CEO Tenure	6066	1.392	1.548	1.058	0.742	2.197	-1.61	3.798
CEO Network Size	6066	5.260	5.338	1.561	4.263	6.461	0	9.169
Executive Tenure	6066	1.967	2.127	0.687	1.693	2.412	-2.30	3.337
Executive Network Size	6066	5.756	5.775	1.042	5.090	6.490	1.771	8.571
CEO Age	6066	4.036	4.043	0.127	3.951	4.127	3.466	4.477
CEO Gender	6066	0.032	0	0.176	0	0	0	1
CEO Experience	6066	0.740	0	1.166	0	2.097	0	3.932
CEO Education	6066	0.606	1	0.489	0	1	0	1
Board Size	6066	11.04	10	3.869	8	13	3	33
Board Independence	6066	0.765	0.790	0.129	0.686	0.875	0.261	1
Liquidity	6066	23.63	21.92	12.31	15.14	30.12	0.330	86.52
Leverage	6066	79.63	83.03	14.02	74.88	88.39	5.409	96.54
Loan Provisions	6066	0.190	0.070	0.432	0.031	0.164	0.015	5.409
Capital-Asset Ratio	6066	10.33	9.370	5.363	7.830	11.43	0.070	65.42
Cost-to-Income	6066	71.38	66.90	24.18	58.99	76.94	6.360	210
ROA	6066	0.548	0.840	1.784	0.410	1.160	-9.99	9.510
Size	6066	0.317	-0.13	1.917	-0.90	1.023	-4.42	8.027
Institutional Investment	6066	32.32	25.29	26.69	8.890	53.25	0.010	100
Individual Investment	6066	13.24	8.590	13.77	3.450	18.43	0.010	90.21
HH-Index	6066	0.044	0.016	0.095	0.006	0.031	0	0.997

The average natural logarithm of CEO tenure is 1.392. The average natural logarithm of network size of CEO is 5.260. The findings of Hermalin and Weisbach's study (1991)

show that there is an optimum CEO tenure, which is less than ten years; the unreported CEO tenure is 6.14 years in this study. The average natural logarithm of CEO age is 4.036; the unreported descriptive statistics of CEO age shows that the average CEO age is 57 in the sample. The average natural logarithm of CEO Experience is 0.74 and indicates that the time of the CEO in the same bank before being appointed as the CEO is less than the tenure of the CEO. In the sample, 3.2 percent of the CEOs are female, and 60 percent of the CEOs hold at least one post-graduate level diploma. The average board size is 11.04 and indicates that the boards are constructed with more than 11 members in the sample. The findings of Upadhyay et al.'s (2014) study suggest that the average board size of the sample is more than 9 and consistent with the findings of this study. In the sample, 76.5 percent of the board members are independent outside directors; the results of the study is in line with the results of Adams and Mehran's (2012) study, which shows that board independence is 70 percent in large bank holding companies sample.[20]

The mean of liquidity that is measured by the liquid assets to total assets ratio is 23.63 percent. According to Deangelo and Stulz (2013), banks generate liquidity by increasing the leverage. The average leverage measure that is the total debt to total assets in the sample is 79.63 percent. The average loan provisions variable is 0.19 in which loan provisions variable denotes the ratio of loan loss provision total loans. In the sample, the average Capital-Asset ratio and cost-to-income are 10.33 and 71.38, respectively. The size proxy, which is the natural logarithm of total assets 0.317 in the sample banks for the given period.

The average institutional investment variable that indicates the total ownership percentages of institutional investors of the sample banks is 32.32 percent and greater than the average individual investment variable that denotes the total ownership percentages of individual investors. The institutional investment has become the dominant investor group during the last three decades, and more than two-thirds of the investment is categorised as an institutional investment in the US (Blume and Keim,

[20] Descriptive statistics of executive tenure and executive network size are provided in robustness tests section.

2012; Gompers and Metrick, 2001). The mean of HH-Index is 0.044 in which the average HH-Index points out the dispersed ownership rather than concentrated ownership.

5. Results

5.1. The effect of CEO power on bank risk

The bank and year fixed effects estimation results of the model are provided in this section. In table representations, the estimation results of CEO tenure are provided in Column 1; the estimation results of CEO network size are provided in Column 2; the estimation results of both CEO power variables are provided in Column 3.

5.1.1. Fixed effects estimation results - CEO power and Z-score

The estimation results that aim to measure the effect of CEO power on Z-score are provided in Table 14. As predicted, the coefficient of CEO Tenure is positive and significant in Table 14, Column 1. In other words, longer CEO tenure is related to an increase in Z score. In CEO related control variables, the signs of the coefficients of CEO Age, CEO Gender, and CEO Experience are in line with expectation. In addition, the coefficients of CEO Age and CEO Education are statistically significant. Despite the fact that the coefficients of board related control variables provide the predicted signs, they are insignificant. In bank specific control variables, the coefficients of all variables are in line with the predictions and significant. Additionally, the coefficient of Institutional investment is positive and statistically significant at 1 percent.

The estimation results of CEO Network Size are provided in Table 14, Column 2. The coefficient of CEO Network Size is in line with the coefficient sign prediction and positive; it is also statistically significant at 5 percent; larger CEO network size is associated with an increase in Z score. As expected, the coefficients of CEO related control variables are negative, except CEO Education. Apart from the coefficient of CEO Gender, the coefficients of CEO related control variables are also significant. The coefficient signs of board related variables provide the expected results, and the coefficient of Board Size is statistically significant. In bank-specific variables, Leverage,

Table 14: Fixed effect estimations - CEO power and bank risk: Z-score results

Table 2: Fixed effects estimations - CEO power and bank risk: Z-score results

This table reports fixed effects estimation results. Columns 1 and 2 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 reports the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by Z-score. Z-score is the inverse of the ratio of return on assets plus capital assets ratio divided by standard deviation of return on assets at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Variables	(1)	(2)	(3)
CEO power	CEO Tenure	0.5418*		0.1105*
		(0.320)		(0.066)
	CEO Network Size		0.1508**	0.1487**
			(0.059)	(0.070)
CEO related	CEO Age	-2.6779**	-0.6112**	-1.4116**
		(1.045)	(0.265)	(0.587)
	CEO Gender	-0.6797	-0.3748	-0.0546
		(0.681)	(0.246)	(0.438)
	CEO Experience	-0.0532	-0.1499**	-0.0845
		(0.093)	(0.058)	(0.077)
	CEO Education	-0.5471*	-0.3169**	-0.4667**
		(0.315)	(0.160)	(0.181)
Board related	Board Size	-0.0144	-0.0978***	-0.0706*
		(0.038)	(0.028)	(0.037)
	Board Independence	-0.8392	-0.4875	-2.1855***
		(1.011)	(0.511)	(0.674)
Bank specific	Liquidity	-0.0335***	-0.0071	-0.0122
		(0.012)	(0.008)	(0.010)
	Leverage	-0.1252***	-0.0568***	-0.0615***
		(0.024)	(0.010)	(0.014)
	Loan Provision	0.4341***	0.8369***	0.9221***
		(0.124)	(0.129)	(0.145)
	Capital-Asset Ratio	-0.7777***	-0.6466***	-0.5902***
		(0.091)	(0.040)	(0.055)
	Cost-to-Income	-0.0415***	-0.0044***	-0.0033**
		(0.005)	(0.001)	(0.002)
	ROA	-0.2306***	-0.5457***	-0.5354***
		(0.050)	(0.030)	(0.036)
	Size	0.7739*	1.1942***	0.9479***
		(0.456)	(0.195)	(0.234)
Ownership related	Institutional Investment	0.0318***	0.0190***	0.0193***
		(0.009)	(0.005)	(0.007)
	Individual Investment	-0.0018	-0.0060	-0.0126
		(0.021)	(0.010)	(0.012)
	HH-Index	-0.3941	1.3000*	1.1384
		(1.228)	(0.733)	(0.882)
	Financial Crisis Dummy	-1.8923***	2.2370***	2.2074***
		(0.173)	(0.069)	(0.085)
	N	4987	4987	4987
	R2 overall	0.1769	0.1760	0.1767

Capital-Asset Ratio, Cost-to-Income and ROA provide negative and significant coefficients while the coefficients of Loan Provisions and Size are positive and significant. Also, the coefficients of Institutional Investment and HH-Index are positive and statistically significant.

The estimation results of the CEO power variables are provided in Table 14, Column 3. The coefficients of both CEO power variables are positive and statistically significant. That is, longer CEO tenure and larger CEO network size are associated with an increase in Z score. As predicted, the signs of the coefficients of CEO related control variables are negative, except CEO Education. Also, the coefficient of CEO Age and CEO Education are statistically significant. Board related control variables provide negative and significant coefficients in estimations of Z score. The coefficients of bank specific control variables provide the predicted signs in estimations. Other than the coefficient of Liquidity, bank specific control variables are statistically significant.

5.1.2. Fixed effects estimation results - CEO power and Systematic risk

Table 15 reports the estimation results for systematic risk. In Table 15, Column 1, the coefficient of CEO Tenure provides the expected positive sign and significant at 5 percent. In CEO related control variables, the coefficients of CEO Age and CEO Experience are statistically significant. The coefficients of both of board related control variables are negative and statistically significant. In bank specific control variables, the coefficients of Leverage and ROA are negative and significant while the coefficients of Loan Provision and Size are positive and significant. Also, the coefficient of Institutional Investment is positive and statistically significant as expected.

Table 15, Column 2 delivers the estimation results of the model that investigate the effect of CEO network size on bank systematic risk. As expected, the coefficient of CEO Network Size is positive and statistically significant at 5 percent. CEO related variables provide the predicted coefficient signs. In board related variables, the coefficients of Board Size and Board Independence are negative and significant. The coefficients of Liquidity, Leverage, and ROA are negative and significant. On the other hand, Loan

Table 15: Fixed effects estimations - CEO power and bank risk: systematic risk indicator results

This table reports fixed effects estimation results. Columns 1 and 2 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 reports the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by systematic risk. Systematic risk is the average non-overlapping beta in capital asset pricing model calculated for each bank at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Variables	(1)	(2)	(3)
CEO power	CEO Tenure	0.0312**		0.0315**
		(0.013)		(0.012)
	CEO Network Size		0.0517**	0.0332**
			(0.021)	(0.016)
CEO related	CEO Age	-0.3925***	-0.1813	-0.2256
		(0.142)	(0.164)	(0.150)
	CEO Gender	-0.0562	-0.0518	-0.1128
		(0.162)	(0.143)	(0.146)
	CEO Experience	-0.0345**	-0.0148	-0.0216
		(0.017)	(0.022)	(0.016)
	CEO Education	-0.0148	-0.0516	-0.0538
		(0.048)	(0.054)	(0.045)
Board related	Board Size	-0.0177***	-0.0207***	-0.0168***
		(0.007)	(0.008)	(0.006)
	Board Independence	-0.3720**	-0.3958**	-0.2958*
		(0.161)	(0.180)	(0.153)
Bank specific	Liquidity	-0.0032	-0.0046**	-0.0021
		(0.002)	(0.002)	(0.002)
	Leverage	-0.0083***	-0.0091***	-0.0042***
		(0.002)	(0.002)	(0.001)
	Loan Provision	0.0300*	0.0371**	0.0122
		(0.017)	(0.017)	(0.032)
	Capital-Asset Ratio	-0.0025	-0.0055	-0.0008
		(0.007)	(0.008)	(0.006)
	Cost-to-Income	-0.0009	-0.0010	-0.0009
		(0.001)	(0.001)	(0.001)
	ROA	-0.0284***	-0.0286***	-0.0351***
		(0.010)	(0.010)	(0.010)
	Size	0.5156***	0.5261***	0.4264***
		(0.050)	(0.054)	(0.053)
Ownership related	Institutional Investment	0.0054***	0.0028*	0.0043***
		(0.002)	(0.002)	(0.002)
	Individual Investment	-0.0015	-0.0062**	-0.0003
		(0.003)	(0.003)	(0.002)
	HH-Index	-0.4264	-0.2188	-0.2785
		(0.275)	(0.274)	(0.263)
	Financial Crisis Dummy	0.1224***	0.1144***	0.1552***
		(0.026)	(0.027)	(0.026)
	N	4985	4985	4985
	R2 overall	0.2375	0.2373	0.2374

Provision and Size provides positive and significant coefficients. The coefficients of Institutional Investment and Individual investment provide the predicted signs, and both are statistically significant.

The estimation results of the model that investigate the effect of CEO power variables on systematic risk indicator are provided in Table 15, Column 3. Both CEO power variables have positive and statistically significant coefficients; increased systematic risk indicator is associated with longer CEO tenure and larger CEO network size. As expected, the coefficients of CEO related control variables are negative. In bank specific control variables, the coefficients of variables return predicted signs. On the other hand, only the coefficients of Leverage, ROA, and Size are statistically significant. As ownership related control variable, Institutional Investment has a positive and significant coefficient.

5.1.3. Fixed effects estimation results - CEO power and systemic risk

The estimation results for systemic risk is provided in Table 16. The coefficient of CEO tenure in Table 16, Column 1 is positive and statistically significant at 5 percent. This result reveals that longer CEO tenure is associated with higher systemic risk. CEO related control variables provide expected signs of the coefficients; the coefficients of CEO Age and CEO Experience are significant. As predicted, the coefficients of Board Size and Board Independence are negative. The coefficients of bank specific control variables are in line with the predictions and significant at different confidence intervals. Institutional Investment and Individual Investment return expected signs of the coefficients and statistically significant.

In Table 16, Column 2, the results of the estimation that investigate the effect of CEO network size on bank systemic risk are released. As expected, the coefficient of CEO network size is positive and statistically significant at 1 percent. The coefficients of CEO related control variables provide the predicted signs; CEO Age and CEO Experience are statistically significant. As expected, the coefficients of both board related control variables are negative and significant. Bank specific control variables return with predicted coefficients. Apart from the coefficient of Liquidity, the coefficients of bank-

Table 16: Fixed effects estimations - CEO power and bank risk: systemic risk indicator results

This table reports fixed effects estimation results. Columns 1 and 2 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 reports the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by systemic risk. Systemic risk the marginal expected shortfall of each bank in 5% worst days of the market at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Variables	(1)	(2)	(3)
CEO power	CEO Tenure	0.2076**		0.1437*
		(0.087)		(0.079)
	CEO Network Size		0.3722***	0.3435**
			(0.116)	(0.174)
CEO related	CEO Age	-2.6202**	-2.0034**	-1.9664**
		(1.072)	(0.859)	(0.938)
	CEO Gender	-0.0083	-0.4152	-0.6588
		(0.624)	(1.018)	(0.776)
	CEO Experience	-0.3356***	-0.2152*	-0.0801
		(0.106)	(0.111)	(0.100)
	CEO Education	-0.6009	-0.6512	-0.1644
		(0.334)	(0.412)	(0.319)
Board related	Board Size	-0.0444	-0.0841*	-0.0091
		(0.042)	(0.047)	(0.028)
	Board Independence	-3.7912***	-3.8823***	-1.9013**
		(1.372)	(0.952)	(0.951)
Bank specific	Liquidity	-0.0219***	-0.0205	-0.0271***
		(0.008)	(0.013)	(0.008)
	Leverage	-0.0726***	-0.0942***	-0.0447***
		(0.020)	(0.014)	(0.016)
	Loan Provision	0.6191***	0.0229	1.1515***
		(0.119)	(0.094)	(0.217)
	Capital-Asset Ratio	-0.1489***	-0.1293***	-0.0117
		(0.046)	(0.035)	(0.035)
	Cost-to-Income	-0.0054**	-0.0077**	-0.0043
		(0.002)	(0.003)	(0.003)
	ROA	-0.0720**	-0.0775*	-0.0737**
		(0.028)	(0.040)	(0.037)
	Size	0.9034*	1.4092**	1.0707*
		(0.507)	(0.581)	(0.554)
Ownership related	Institutional Investment	0.0160**	0.0223***	0.0250***
		(0.007)	(0.008)	(0.006)
	Individual Investment	-0.0295**	-0.0064	-0.0208
		(0.014)	(0.017)	(0.016)
	HH-Index	1.1689	-1.6989	-0.6368
		(1.192)	(1.112)	(1.354)
	Financial Crisis Dummy	0.5400***	-0.2898***	0.4720***
		(0.116)	(0.073)	(0.14)
	N	4986	4986	4986
	R2 overall	0.1510	0.1511	0.1509

specific variables are significant. Additionally, the coefficient of Institutional Investment is positive and statistically significant at 1 percent.

Table 16, Column 3 provides the results of the model estimations that inspect the effect of CEO power on systemic risk. Both CEO power variables provide positive and significant coefficients. The plausible explanation of these coefficients indicates that longer CEO tenure and larger CEO network size are related to an increase in systemic risk. The coefficients of CEO related variables are in line with the predicted signs. The coefficient of CEO Age is also statistically significant at 5 percent. The coefficients of Board Size and Board Independence are negative. Bank specific control variables return with predicted coefficient signs, and the coefficients of Liquidity, Leverage, Loan Provision, ROA, and Size are significant. Additionally, ownership related control variables provide the predicted coefficient signs.

5.2. Endogeneity of CEO tenure and CEO network size

The empirical studies of corporate governance that investigate the effect of financial decisions often face with endogeneity issues. The general reasons for endogeneity problem in empirical corporate governance studies are related to measurement errors and lack of finding proper exogenous factors. According to Roberts and Whited (2012), endogeneity is the reason of biased and inconsistent estimation parameter estimates.

In this study, the challenge of identifying the causality between bank risk taking and CEO power arises. In other words, risk taking behaviour that is the aggregate decision of a bank might have potential to affect the tenure and network size of the CEO. In particular, for instance, a bank that takes insolvency risk at lower levels might be eager to appoint CEOs who have relatively smaller network sizes. Also, it is still possible that unobservable bank characteristics affect tenure and network size of the CEO and risk taking the behaviour of banks. For instance, a bank's corporate decision-making process might allow the bank to take excessive risks and might also affect CEO power. In order to deal with endogeneity concerns, the GMM dynamic panel estimators, which is developed by Holtz-Eakin et al. (1988) and Arellano and Bond (1991), are broadly in the literature.

In the literature, GMM that is framework for deriving estimators is broadly defined as an estimation procedure that allows economic models to be specified by avoiding unwanted and/or unnecessary assumptions Hall (2005). An example of these unwanted and/or unnecessary assumptions is requiring particular distribution for the errors. By avoiding these assumptions, GMM becomes applicable in econometric models. GMM estimators use assumptions about the moments of the variables to derive an objective function. The assumed moments of the random variables provide population moment conditions. Particularly, GMM chooses the estimates that minimize a quadratic form of the moment conditions. In this manner, GMM is employed to avoid endogeneity concerns of base model of the study.

To avoid the endogeneity concerns, the model is re-estimated by using GMM estimator that is developed for dynamic panel models by following Levine et al. (2000). It is assumed that explanatory variables independent and identically distributed, in which each explanatory variable has the same probability distribution and mutually independent. GMM estimator, which employs lagged values of both levels and differences until orthogonality is reached, is an instrumental variable approach. The lagged values of each risk proxy that is employed in the base model is employed as the instrumental variable of each GMM estimator. In each GMM estimator of the risk proxies, one instrumental variable is employed. By ensuring efficiency and consistency, GMM estimator provides that the model is not subject to the serial correlation of order two. Also, the Arellano-Bond test for AR (2) and Hansen tests show that the instruments that are employed in the models are valid.

5.2.1. GMM estimation results – CEO power and Z-score

Table 17, Column 1 provides the results of GMM estimations of Z score in which the CEO power variable is CEO tenure. The coefficient of CEO tenure is significant and statistically significant at 1 percent. The coefficients of CEO related variables are in line with the predicted signs and negative. Additionally, the coefficients of CEO Age and CEO Experience are statistically significant. Both of the board related control variables are negative and significant. Bank specific control variables return predicted significant signs. Also, the coefficient of Institutional Investment is positive and significant.

Table 17: Generalised method of moments (GMM) estimations - CEO power and bank risk: Z-score results

This table reports GMM estimation results. Columns 1 and 2 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 reports the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by Z-score. Z-score is the inverse of the ratio of return on assets plus capital assets ratio divided by standard deviation of return on assets at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Variables	(1)	(2)	(3)
	Lag of dependent variable	0.4779***	0.4483***	0.4839***
		(0.013)	(0.013)	(0.012)
CEO power	CEO Tenure	0.2600***		0.2353***
		(0.047)		(0.047)
	CEO Network Size		0.1454***	0.4005***
			(0.051)	(0.113)
CEO related	CEO Age	-0.5153***	-0.4795**	-0.3724**
		(0.175)	(0.198)	(0.181)
	CEO Gender	-0.0520	-0.1871	-0.0381
		(0.107)	(0.170)	(0.104)
	CEO Experience	-0.0480**	-0.0447**	-0.0534***
		(0.020)	(0.021)	(0.019)
	CEO Education	-0.1527	-0.5789***	-0.0232
		(0.182)	(0.178)	(0.153)
Board related	Board Size	-0.0598***	-0.0263	-0.0634***
		(0.017)	(0.018)	(0.017)
	Board Independence	-1.3355**	-0.5342	-1.2738**
		(0.582)	(0.579)	(0.581)
Bank specific	Liquidity	-0.0035*	-0.0031	-0.0044**
		(0.002)	(0.002)	(0.002)
	Leverage	-0.0075***	-0.0052**	-0.0072***
		(0.002)	(0.002)	(0.002)
	Loan Provision	0.0880***	0.0878**	0.1031***
		(0.034)	(0.037)	(0.034)
	Capital-Asset Ratio	-0.2268***	-0.2324***	-0.2193***
		(0.012)	(0.013)	(0.013)
	Cost-to-Income	-0.0070***	-0.0043***	-0.0066***
		(0.001)	(0.001)	(0.001)
	ROA	-0.5303***	-0.5507***	-0.5143***
		(0.033)	(0.036)	(0.033)
	Size	0.5956***	0.5923***	0.5808***
		(0.189)	(0.218)	(0.189)
Ownership related	Institutional Investment	0.0234***	0.0244***	0.0225***
		(0.004)	(0.004)	(0.004)
	Individual Investment	-0.0063	-0.0020	-0.0047
		(0.008)	(0.009)	(0.008)
	HH-Index	0.0002**	1.5815	1.8696*
		(0.000)	(1.041)	(1.040)
	Financial Crisis Dummy	1.7089***	1.7521***	1.7198***
		(0.047)	(0.053)	(0.047)
	N	3881	3881	3881
Hansen test (2nd step; p-value)		0.744	0.948	0.931
Arellano-Bond test AR(2) (p-value)		0.106	0.056	0.231

The results of the GMM estimations for CEO power and control variables are provided in Table 17, Column 2. As predicted, the coefficient of CEO Network Size is positive and significant at 1 percent. The signs of the coefficients of CEO related control variables are in line with the predictions and statistically significant; the only exception is the coefficient of CEO Gender. Bank specific and ownership related control variables provide expected coefficient signs.

Table 17, Column 3 provides the GMM estimation results for both of the CEO power variables and controls. The coefficients of CEO Tenure and CEO Network Size are positive and statistically significant at 1 percent. CEO related control variables deliver predicted coefficient signs; the coefficients of CEO Age and CEO Experience are also significant. The signs of the coefficients of Board related and ownership related control variables are in line with the predicted signs and statistically significant.

5.2.2. GMM estimation results – CEO power and systematic risk

Table 18 reports the results of GMM estimation that investigate the effect of CEO power variables on systematic risk. In Table 6, Column 1, the coefficient of CEO Tenure delivers the expected positive sign and statistically significant at 5 percent. In CEO related control variables, the coefficients provide the predicted signs. On the other hand, only the coefficient of CEO Age is statistically significant. The coefficients of board related control variables are negative and statistically significant. In bank specific control variables, the coefficients of Leverage, Capital-Asset ratio, Cost-to-Income, and ROA are negative and significant. Additionally, the coefficient of Institutional Investment is positive and statistically significant as predicted.

Table 18, Column 2 provides the GMM estimation results of the model that investigate the effect of CEO network size on bank systematic risk. As predicted, the coefficient of CEO Network Size is positive and statistically significant at 5 percent. CEO related variables provide the predicted coefficient signs. On the other hand, CEO Age is the only CEO related control variable that is also significant. In board related variables, the coefficient of Board Size is negative and significant.

Table 18: Generalised method of moments (GMM) estimations - CEO power and bank risk: systematic risk indicator results

This table reports GMM estimation results. Columns 1 and 2 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 reports the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by systematic risk. Systematic risk is the average non-overlapping beta in capital asset pricing model calculated for each bank at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Variables	(1)	(2)	(3)
	Lag of dependent variable	0.1802***	0.1801***	0.1228**
		(0.048)	(0.045)	(0.056)
CEO power	CEO Tenure	0.0847**		0.2077***
		(0.043)		(0.055)
	CEO Network Size		0.0765**	0.1130**
			(0.034)	(0.044)
CEO related	CEO age	-0.3901***	-0.3784***	-0.3691***
		(0.139)	(0.125)	(0.124)
	CEO Gender	-0.0831	-0.3392	-0.5200
		(0.098)	(0.321)	(0.384)
	CEO Experience	-0.0238	-0.0068	-0.0145
		(0.016)	(0.014)	(0.016)
	CEO Education	-0.0868	-0.2257	-0.0243
		(0.185)	(0.155)	(0.169)
Board related	Board Size	-0.0231**	-0.1125***	-0.1428***
		(0.010)	(0.030)	(0.044)
	Board Independence	-0.3961*	-0.0350	-0.1407
		(0.236)	(0.244)	(0.287)
Bank specific	Liquidity	-0.0022	-0.0025	-0.0015
		(0.003)	(0.003)	(0.004)
	Leverage	-0.0078***	-0.0158***	-0.0219***
		(0.003)	(0.005)	(0.006)
	Loan Provision	0.0090	0.1635***	0.1561**
		(0.080)	(0.062)	(0.075)
	Capital-Asset Ratio	-0.0160**	-0.0037	-0.0046
		(0.007)	(0.005)	(0.006)
	Cost-to-Income	-0.0049***	-0.0042***	-0.0040***
		(0.001)	(0.001)	(0.001)
	ROA	-0.0410*	-0.0079	-0.0228
		(0.021)	(0.014)	(0.022)
	Size	0.0189	0.1195***	0.1059***
		(0.044)	(0.033)	(0.038)
Ownership related	Institutional Investment	0.0176***	0.0061*	0.0074*
		(0.004)	(0.003)	(0.004)
	Individual Investment	-0.0072	-0.0074	-0.0081
		(0.008)	(0.008)	(0.010)
	HH-Index	-0.4219	0.7118	0.2878
		(0.538)	(0.463)	(0.541)
	Financial Crisis Dummy	0.0158	-0.0091	-0.0140
		(0.030)	(0.030)	(0.031)
	N	3878	3878	3878
Hansen test (2nd step; p-value)		0.938	0.909	0.922
Arellano-Bond test AR(2) (p-value)		0.097	0.114	0.094

The coefficients of Leverage and Cost-to-Income are negative and significant. On the other hand, Loan Provision and Size provides positive and significant coefficients. The coefficients of ownership related control variables provide the predicted signs.

In Table 18, Column 3, the GMM estimation results of the model that investigate the effect of CEO power variables on systematic risk are provided. CEO Tenure and CEO Network Size return positive and statistically significant coefficients; the longer CEO tenure and larger CEO network size are associated with higher systematic risk indicator. In line with the predictions, the coefficients of CEO related control variables are negative, and the coefficient of CEO Age is statistically significant. In bank specific control variables, the coefficients of variables return predicted signs. On the other hand, the coefficients of Leverage, Loan Provision, Cost-to-Income, and Size are statistically significant. In ownership related control variable, the coefficients of Institutional Investment and Individual Ownership provide the expected signs, and Institutional Investment has significant coefficient.

5.2.3. GMM estimation results – CEO power and systemic risk

The GMM estimation results for systemic risk is provided in Table 19. In Table 19, Column 1, the coefficient of CEO tenure is positive and statistically significant. CEO related control variables provide expected signs of the coefficients; the coefficients of CEO Age and CEO Gender are significant at 1 percent. As predicted, the coefficients of board related control variables are negative and statistically significant. The signs of the coefficients of bank specific control variables are in line with the predictions. Institutional Investment and Individual Investment deliver expected signs of the coefficients and significant.

In Table 19, Column 2, the results of the GMM estimation that explore the effect of CEO network size on bank systemic risk are provided. As predicted, the coefficient of CEO network size is positive and significant at 1 percent. The coefficients of CEO related control variables provide the predicted signs; CEO Gender and CEO Education are statistically significant at 5 percent.

Table 19: Generalised method of moments (GMM) estimations - CEO power and bank risk: systemic risk indicator results

This table reports GMM estimation results. Columns 1 and 2 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 reports the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by systemic risk. Systemic risk the marginal expected shortfall of each bank in 5% worst days of the market at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Variables	(1)	(2)	(3)
	Lag of dependent variable	0.4244***	0.4514***	0.4313***
		(0.021)	(0.012)	(0.013)
CEO power	CEO Tenure	0.0813**		0.0255*
		(0.038)		(0.015)
	CEO Network Size		0.1107***	0.1069*
			(0.023)	(0.059)
CEO related	CEO Age	-0.1838***	-0.7002	-0.7241***
		(0.071)	(0.465)	(0.165)
	CEO Gender	-0.7713***	-0.6450**	-0.1398
		(0.220)	(0.251)	(0.147)
	CEO Experience	-0.0706	-0.0088	-0.0028
		(0.071)	(0.013)	(0.022)
	CEO Education	-0.1308	-0.1478**	-0.0001
		(0.094)	(0.065)	(0.089)
Board related	Board Size	-0.0686*	-0.0451***	-0.0263***
		(0.040)	(0.015)	(0.009)
	Board Independence	-1.3616***	-1.6203***	-0.9829***
		(0.437)	(0.329)	(0.293)
Bank specific	Liquidity	-0.0081	-0.0019	-0.0002
		(0.006)	(0.004)	(0.001)
	Leverage	-0.0013	-0.0090***	-0.0051***
		(0.001)	(0.002)	(0.002)
	Loan Provision	0.0545	0.3277***	0.0661
		(0.056)	(0.068)	(0.043)
	Capital-Asset Ratio	-0.0052	-0.0564***	-0.0376***
		(0.003)	(0.015)	(0.011)
	Cost-to-Income	-0.0007	-0.0004	-0.0007
		(0.001)	(0.000)	(0.000)
	ROA	-0.0065	-0.0020	-0.0129*
		(0.016)	(0.005)	(0.008)
	Size	0.1705**	0.3093***	0.2445***
		(0.084)	(0.107)	(0.078)
Ownership related	Institutional Investment	0.0052***	0.0060***	0.0046***
		(0.002)	(0.002)	(0.001)
	Individual Investment	-0.0259**	-0.0004	-0.0061
		(0.011)	(0.003)	(0.004)
	HH-Index	-0.1121	-0.3012	-0.4064
		(0.430)	(0.424)	(0.379)
	Financial Crisis Dummy	-0.0588*	-0.0279	-0.1013***
		(0.030)	(0.024)	(0.029)
	N	3876	3876	3876
Hansen test (2nd step; p-value)		0.978	0.961	0.904
Arellano-Bond test AR(2) (p-value)		0.615	0.730	0.257

As expected, the coefficients of both of the board related control variables are negative and significant at 1 percent. Bank specific control variables return with predicted coefficients. The coefficients of Leverage, Loan Provision, Capital-Asset Ratio, and Size are significant at 1 percent. Additionally, the coefficient of Institutional Investment is positive and statistically significant at 1 percent.

Table 19, Column 3 delivers the results of the GMM estimations that examine the effect of CEO power on systemic risk. CEO power variables provide positive and significant coefficients. These results emphasise that longer CEO tenure and larger CEO network size are related to an increase in systemic risk. The coefficients of CEO related variables are negative, and the coefficient of CEO Age is also statistically significant at 1 percent. The coefficients of board related control variables are negative and statistically significant at 1 percent. The coefficients of bank specific control variables are in line with predicted coefficient signs and the coefficients of Leverage, Capital-Asset Ratio, ROA, and Size are significant. Also, ownership related control variables provide the predicted coefficient signs, and the coefficient of Institutional Investment is significant at 1 percent.

5.3 Interpretations of the results of Fixed Effects and GMM estimations

Collectively, the fixed effects estimation results in Tables 14, 15, and 16 and the GMM estimation results in tables 17, 18, and 19 that denote the effect of CEO power on different risk taking proxies tell a consistent story. The coefficients of CEO Tenure and CEO Network Size in estimations with Z score, systematic risk, and systemic risk are positive and statistically significant.

Despite the reverse findings of other studies (i.e., Bettis et al., 2000; Chakraborty et al., 2007; Muscarella and Zhao, 2015), this finding is in line with the some of the studies that detect positive relationship between tenure and risk taking (i.e., Bloom and Milkovich, 1998; Serfling, 2014). The plausible justification of this finding is related to risk taking the behaviour of CEOs in different periods of their careers; the recent studies in the literature point out that professional managers are risk averse in early periods of their careers (Chen, 2015; Fu and Li, 2014). Consistent with the suggestions of the Westphal et al.'s (2001) study, the results indicate that greater CEO network size affects the

corporate decision-making process of banks and allows to take more risk. One of the potential reason of this relationship is the information advantage of networks that allow CEOs to use the benefits of information advantage from their networks (Faleye et al., 2014).

The CEO related control variables provide predicted coefficient signs in estimations. In fixed effects and GMM estimations, CEO Age has negative coefficient signs. The plausible justification of this result is related to the risk tolerances of executives at different ages. Similarly, this finding is consistent with the finding of Bucciol and Miniaci's (2010) study that points out the higher risk tolerance of professional managers at older ages. The literature does not allow to make distinct coefficient sign predictions of CEO Gender and CEO Experience in estimations. The literature is fed by different studies that provide mixed results. For instance, there is negative relationship investigated between gender diversity and risk taking (Farrell and Hersch, 2005). On the other side, Adams and Funk (2011) advocate that female managers are more risk taker than male managers. In estimations for various bank risk proxies, the sign of the coefficient of CEO Gender is consistent and negative. As in CEO Age, there is no clear expectation on the coefficient signs of CEO Experience in estimations. The results show that there is a negative relationship between CEO Experience and different risk measures. Also, the coefficients of CEO Education in estimations are negative and insignificant. By employing Z-score, systematic risk, and systemic risk proxies to measure the bank risk, the overall results of estimations tell that inexperienced, less well educated, younger, and male CEOs increases bank risks.

Board Size and Board Independence are employed to control the effect of board structure on the relations between CEO power and bank risk. In theory, board size and board independence are discussed as tools that increase the efficiency of monitoring and advising functions of the board of directors. In estimations, the coefficients of Board Size and Board Independence are negative and statistically significant in most of the estimations for different risk taking proxies. Despite the controversial findings in the early literature, the recent studies indicate that there is a negative relationship between board size and risk taking (i.e., Cheng, 2008; Wang, 2012). Board independence is an important corporate governance tool that aims to establish the mechanism to deal with principal-

agent problem (Fama and Jensen, 1983). The findings related to board independence are in line with Pathan's (2009) study that indicates the negative relationship between board independence and risk taking. Collectively, the estimation results document that smaller and less independent board increases bank's excessive risk taking.

In this study, liquidity, debt, loan, capital, and asset structures of banks and their effects on risk taking are controlled. As predicted, the coefficients of Liquidity that is measured by the ratio of liquid assets to total assets are negative. The coefficients of Leverage that is measured by the ratio of book value of liabilities to total assets are negative. These findings are consistent with the findings of Demsetz et al.'s (1997) and Dell'Ariccia et al.'s (2014) studies that show the negative relationship between leverage and risk taking. In estimations, the coefficients of Loan Provisions that is the ratio of loan loss provision to total loans are positive. These findings are consistent with the previous literature (i.e., Barth et al., 2001; Beatty and Liao, 2011; Bushman and Williams, 2015). Compatible with the findings of Calem and Rob's (1999) and Berger et al.'s (2014) studies that point out the negative relationship between capital-asset ratio and risk taking, the coefficients of Capital-Asset Ratio that is measured by the ratio of risk-weighted capital to total assets are negative. The estimation results for Cost-to-income, which is the ratio of operating expenses to total operating income, provide the predicted negative signs. Consistent with the previous literature (i.e., Faccio et al., 2011; García-Marco and Robles-Fernández, 2008; Houston et al., 2010), ROA that is the earnings before interest and taxes to book value of total assets ratio provide negative and significant coefficients in estimations. The coefficient of Size that is the natural logarithm of total assets are positive and significant in estimation. The findings on Size in this study is in line with the findings of Demirgüç-Kunt and Huizinga's (2013) and Bhagat et al.'s (2015) studies that show the positive relationship between the size and bank risk taking. By estimating the Z-score, systematic risk, and systemic risk of banks, the overall results on bank specific control variables state that illiquid, less leveraged, less profitable, and less well-capitalized larger banks that have higher loan losses take more risk.

The ownership structure of banks is also controlled by employing Institutional Investment, Individual Investment, and HH-Index variables. The estimation results provide positive and significant (for most of the estimation steps) between institutional

ownership and risk taking. On the other hand, the coefficients of Individual Investment are negative, and these results are in line with the findings of Laeven and Levine's (2009) study. Additionally, HH-Index that measures the ownership concentration of banks provides mixed results in estimations. Under these conditions, it could be stated that more institutional investment in banks increases bank risk. The credible explanation of this relationship might be related to investment strategies of institutional investors. Additionally, this finding is consistent with the results of Barry et al. (2011) study that show the positive relationship between institutional ownership and bank risk.

Briefly, estimations of the model in which banks' Z-score is the risk measure are presented in Tables 2 and 5. The tables show fixed effects and GMM estimates, with the CEO power variables are entered individually and together. The coefficients of the CEO power variables are positive and statistically significant in the estimations. That is, longer CEO tenure and larger CEO networks size associated with an increase in bank risk. It is interpreted as supporting the hypothesis that bank risk increases as CEO power increases. The risk appears to be related to CEO Age, CEO Experience, and CEO Education with risk taking appearing to decline as CEO's older age and gained more experience in the job, which would be consistent with powerful CEOs enjoying larger private benefits from control later in their careers. Less well-educated CEOs also appear to favour more risk taking. The results indicate that corporate governance institutions have some effect in constraining CEO power, with larger and more independent executive boards associated with reduced bank risk taking. The bank-specific variables indicate that banks take on less risk if they are more liquid, more highly leveraged, are better capitalised and are more profitable, and that an increase in loan loss provisions and bank size are associated with greater risk taking activities. This is broadly in line with what the literature suggests. Finally, the results support the view that a larger share of institutional investor owners and a smaller share of individual investor ownership is associated with more risk taking, though greater ownership concentration seems to mitigate risk consistent (though the coefficients are only statistically in the GMM estimates). The results largely indicate that bank risk is increased in the financial crisis period.

The results do not change substantially when the systematic and systemic indicators of bank risk are employed as the dependent variable, as reported in Tables 3 and 6 for

systematic risk and Tables 4 and 7 for systemic risk, respectively. Specifically, CEO power is associated with greater bank risk taking on these risk measures also. However, of the individual CEO characteristics, only age appears to be consistently important in determining (reducing) risk. Board size and board independence also constrain risk taking on these risk measures, and the bank-specific variables act in broadly the same manner as in the results for the Z score measure of risk. Of the ownership-related variables, only the coefficient on the institutional investors share is consistently significant where it indicates an association with more risk taking.

5.4. Robustness Tests

In this section, robustness tests are employed to verify the sustainability of the estimations of the model.

5.4.1. Executive power and bank risk

The traditional agency theory differentiates principals and agents and defines their roles within the organisation. An agent is positioned against the board of directors that is the representatives of principals (Dominguez-Martinez et al., 2008; Guo and Masulis, 2015; Oshry et al., 2010). Consistent with the classification of the agency theory, most of the studies in the literature explore them separately.

The purpose of this study is to investigate the effect of CEO power on bank risk by employing CEO tenure and CEO network size variables in estimations. In order to validate the estimation results of the baseline model, CEO power variables are replaced with executive power variables (executive tenure and executive network size) and the model is re-estimated. The term "executive" denotes the group that consists of board members and the CEO of a bank in the sample. Despite the fact that the CEOs and other professional managers are in charge of the daily affairs of the business and directly responsible for the performance, board members have indirect responsibility for the performance by nominating the CEO and deciding on the remuneration policy. For example, Westphal et al. (2001) point out that board of directors has a significant effect on imitating corporate decision-making processes to adapt the firm to the environment.

This leads the idea that board members might have the power that provides information advantage in the organisation. To specify professionals who have an information advantage, the sample of this study takes these two groups (CEOs and board members) as one group and defines this combined group as "executives" (Demsetz et al., 1997). Consistent with the predictions of CEO power variables, the predicted signs of the relationship between executive power and bank risk is positive.

Executive tenure is winsorised average of the tenure of board members and the CEO. In the literature, board tenure is calculated as the average of the tenure of all directors in a given term (e.g., Abdelsalam and El-Masry, 2008; Donoher and Reed, 2007; Hermalin and Weisbach, 1988; Kor and Sundaramurthy, 2009). This approach does not correctly reflect the marginal changes in tenure at retirement of a board member and appointment of an apprentice. In order to winsorize the extreme changes at tenure, the equation that is employed is as follows;

(3) $$\sqrt{\boldsymbol{\Sigma} x_{it}^2 / n}$$

where x_{it} is the tenure of executive i at year t; and n is the total number of board members and the CEO. The average natural logarithm of executive tenure is 1.967 and greater than that of CEO tenure.

Executive Network Size is the average number of network nodes of board members and the CEO that includes employment, education, and social connections. In the sample, the average natural logarithm of executive network size is 5.756, which is higher than the average natural logarithm of network size of the CEO.

The fixed effects and GMM estimations results are provided in Tables 22, 23, and 24 in Appendix D.[21] The results of the fixed effects and GMM estimations indicate that publicly listed US banks take more risk when executives have longer tenure and larger network size. These findings are consistent with the expectations and also in line with the argument that information advantage of board members exacerbate risk taking (Drechsler et al.,

[21] Hausman test results of the executive power sample are provided in Appendix C, Table 9.

2016; Mehran et al., 2011). Estimation results of three bank risk indicators point out that (i) younger, less well educated, and less experienced male CEOs take more insolvency risk; (ii) bank risk increases with the presence of smaller and less independent boards; (iii) illiquid, less leveraged, less well capitalized, and less profitable larger banks face higher risks; (iv) more institutional and less individual investment in banks increases bank risk.

5.4.2. The period before the Dodd-Frank Act of 2010

The recent financial crisis and its effects on the financial market have become the reasons for structural changes in the US. Liou (2013) discusses the four major reasons for the financial crisis. These reasons are (i) the weak corporate governance structure of financial firms and their contingency effect in overall economy; (ii) the dispersion of systemic risk throughout the markets; (iii) undetectable and uncontrollable deregulation process of banking industry in 2000s and its invasion in non-traditional businesses; (iv) moral hazard and unethical actions of professionals. These four reasons mainly lead the excessive risk taking of managers to make profits in the short-run in an environment of weak risk management. The excessive risk taking of individuals metaphorically creates snowball effect in financial markets because of the integration of institutions with each other (Coffee, 2011).

The Dodd-Frank Act of 2010 that is effective since July 2010 was designed to deal with the problems of the recent financial crisis. The main purpose of the Act is to reduce the systemic risk that causes crises and recessions in financial markets. There are five main targets of the Act: (i) consolidating the regulatory agencies that includes the elimination of the national thrift charter and establishing the mechanism to evaluate systemic risk; (ii) regulating the financial markets that aims to increase the transparency of derivatives; (iii) increasing the efficiency of consumer protection by establishing a new consumer protection agency and defining uniform standards for strengthened investor protection; (iv) creating tool for financial crises that includes "resolution regime" complementing the existing FDIC authority to allow for elderly winding down of bankrupt firms, and including a proposal that the FED receive authorisation from the Treasury for extensions of credit in "unusual or exigent circumstances"; (v) setting up measures that aim to

increase international standards and cooperation including proposals related to improved accounting and tightened regulation of credit rating agencies. Especially, the Act aims to end the concept of "too big to fail" in financial markets that is one of the sources of moral hazard problem in the overall economy.

In order to complete the afforomantioned changes in financial markets, the Act proposes to impose capital and leverage requirements to prevent the creation of institutions that have potential to become too big before failed. Also, the Act allows regulators to establish new mechanisms to investigate financial institutions to control their risk management. For instance, the Financial Stability Oversight Council that monitor the systemic risk within the financial markets has been organised according to the Act. In addition to the market watch duty of the Act, it also introduced new regulations that allow shareholders to attend daily corporate affairs of firms and has established the Consumer Financial Protection Bureau to decrease information asymmetry and provide accurate information about financial products to all investors in the market. Overall, the Act proposed essential changes in financial markets and created an important externality in the system.

In this study, the dataset that is employed in estimations of the model covers the period of financial crisis and the effective date of the Dodd-Frank Act of 2010. Thus, in baselines of the model, the financial crisis is controlled by the binary variable. Under these conditions, the robustness of the results is checked by restructuring the period of the dataset according to the effective date of the Dodd-Frank Act. The reason for this is that the regulations proposed by the Dodd-Frank Act of 2010 mainly target to monitor and decline systemic risk in financial markets. In this manner, the effect of the Act that aims to change the financial markets in deep is needed to be taken into consideration in this study. Accordingly, taking the period of the regulatory changes off from the timeline of the dataset and using the period before the Act is useful to validate the results of the baseline results of the model. In order to do this, (i) the data is restructured for the period of 1998 and 2010; (ii) model is re-estimated by using the dataset with the new time horizon.

The fixed effects and GMM estimation results of CEO Tenure and CEO Network Size on Z-score, systematic risk, and systemic risk are provided in Appendix E, Tables 25 through

27. Consistent with the results in estimations of baseline model, the results indicate that CEO Tenure and CEO Network Size, which are employed individually and together, have positive and significant effects on Z-score, systematic risk, and systemic risk. Additionally, most of the coefficient signs of the control variables provide consistent results with the coefficient signs in baseline estimation results; the only exception is the coefficient of Individual Investment in Table 15, Column 6. Further, the overall results mainly show that (i) female and more experienced CEOs decline the bank risk; (ii) the bank risk declines with the presence of larger and more independent boards; (ii) less leveraged, larger banks take excessive risks; (iii) increase in institutional ownership has a positive effect on bank's excessive risk taking.

6. Conclusion

A growing literature focuses on the relationship between Chief Executive Officers (CEOs) and corporate risk. However, it has largely ignored the role of powerful CEOs, which has been shown in several studies to impact on many aspects of firm behaviour and outcomes. This study explores the effect of CEO power, which is represented by CEO tenure and CEO network size, on bank risk. In detail, the career concerns of the CEO, which is linked to CEO tenure in this study, might also affect bank risk. It is assumed that newly appointed CEOs are more concerned about their careers than longer-tenured CEOs and longer tenure increases moral hazard. In the literature, it is documented that executive managers are risk averse in their early careers (Chen, 2015; Fu and Li, 2014). Also, it is stated that network is employed to transfer information between nodes (Hong et al., 2005) and can change the structure of information in the literature (Brass et al., 2004). In theory, networks provide different access points for the same node at interchangeable environments and generate information advantage for individuals (Madhavan et al., 1998). It is assumed that information advantage of CEOs create information asymmetry for other components of the business and exacerbate the adverse selection that causes excessive risk taking. With these assumptions, it is hypothesised that powerful CEOs with longer tenure and larger network sizes increases bank risk taking.

In this study, the purpose is to add to empirical evidence on hypothesised relationship from the perspective of tenure and network size of the CEO and help to fill the gap in

corporate governance and bank risk taking literature. The risk measures are Z-score that denotes the insolvency risk of a bank, systematic risk that denotes the uncertainty inherent to the entire market, and systemic risk that denotes bank's risk of collapse of the entire market. By employing the sample of 908 publicly listed US banks for the period of 1998 and 2015 and controlling the factors that might affect bank risk, the hypothesised relationship is examined by bank and year fixed effect regressions. Additionally, GMM estimator is employed in both of the models to mitigate the endogeneity concerns.

The fixed effects and GMM estimation results in which the CEO power variables are CEO tenure and CEO network size suggest that publicly listed US banks take more risk when CEO has longer tenure and larger network size. In general, first, Z-score estimation results show that less profitable, less leveraged, less well capitalised larger banks, which have loan loss problems, with younger and less experienced CEOs, take more risk. Second, systematic risk estimation results indicate that less leveraged and less profitable larger banks, which have loan loss problems, with younger CEOs, take more risks. Third, systemic risk estimation results show that less leveraged and less profitable larger banks, which have loan loss problems, with younger CEOs, take more risk. Smaller and less independent boards and more institutional investment increases bank risk in three of these risk indicator estimations. The re-estimation results for executives and the period before the Dodd-Frank Act provide similar results.

The empirical findings derived from the bank related determinants pointed out that less well-capitalized banks take more risk. Additionally, it is also pointed out that bank risk increases at relatively large banks. This is consistent with "too big to fail" in which relatively larger banks generate negative externalities in overall system. As an efficient policy implication, the capital requirements of the banks should be re-examined. Especially, regulators should regularly inspect the compliance of relatively larger banks on capital requirements. In addition to the technical evaluations of banks, regulators should set up red flags that provide information related to extended CEO power indicators.

Overall, the empirical evidence is economically meaningful and robust. They also indicate that information advantages related to CEO power lead banks to take excessive

risk. This supports the idea that the presence of effective corporate governance mechanisms is needed for the stability of banking systems.

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Appendix A: Theoretical Framework

The decision of risk taking is strongly connected to the concept of managerial incentives in which the incentives drive excessive risk taking of an agent at the cost of principal and incentive structure that adversely affects the financial system stability by increasing the excessive risk taking (Windram, 2005). In finance literature, the principal-agent problem addresses the diverse interests of agents and principals, who have their self-interests (Jensen and Meckling, 1976). The discussions on the principal-agent problem have lifted the literature and investigation of the problem have shaped theoretical framework. For example, the concept of rationing is introduced to deal with asymmetric information (Stiglitz and Weiss, 1981). Additionally, Akerlof (1970) addresses the adverse selection that is linked to asymmetric information.

One of the dimensions of corporate governance literature is to investigate the principal-agent problem by focusing on agent relations. Jensen and Meckling (1976) point out the ownership related problems by specifying the occurrence period of moral hazard. The first of them is the managerial moral hazard that starts with the appointment of an agent by a principal. In theory, the agent manages the affairs of the firm. However, the agent may have self-interests different than the principals. The second is asset substitution moral hazard problem that is the wealth transfer of an agent from stakeholders such as debtholders and shareholders. In order to complete the transfer of wealth, the agent takes excessive risk.

Asset substitution moral hazard consists of a procedure that is finished with taking excessive risk and changed the risk taking behaviour of a bank because of the information asymmetry. In this process, risk taking incentives play a crucial role to transform managerial moral hazard into the asset substitution moral hazard.

1. Agency theory and bank risk taking

1.1. Agency theory: antecedents and consequences of the principal-agent problem

Principal-agent problem points out the different priorities between principals and agents. Agency theory is the economic analysis of the cooperation between the counterparts under the conditions of externalities, uncertainties, and information asymmetry that push the organisation from the perfect market conditions (Ballwieser, 1989). The core concept of agency theory is information asymmetry, and the target is to resolve the dilemma in the cooperation of participants who have different ordered information-related power (Eisenhardt, 1989). In addition to the information asymmetry, Saam (2007) defines two more sources of a dilemma in agency theory: (i) different risk preferences that indicate different risk attitudes of participants, (ii) goal conflicts that consist of different pattern and level of utility maximisations of participants. Under these conditions, the relationship between principal and agent depends on characteristics of participants (hidden or visible), risk perceptions (Eisenhardt (1989, p. 60f) states that principals are risk neutral), efforts (hidden or visible) to maximise the own utility. Pareto Optimum relationship can be established if the principal efficiently and effectively monitors the agent and has instruments to force the agent to converge to his/her priorities. On the other hand, market failure, in the form of adverse selection and moral hazard, arises if the monitoring of the principal is failed.

1.2. Adverse Selection

In the case of hiring period of an agent (a similar case can be defined as the dealing period), principal who suffers from information asymmetry (lack of sufficient information) may make an unwise decision (Banker et al., 2012) and the comprehensive recruitment strategy fails (Oyer and Schaefer, 2010). The mechanism of hiring with information asymmetry depends on the mismatch choices on average productivity of a heterogeneous group of agents in the market. If the principal offer compensation (bonus, salary, or any form of compensation) equals to average productivity of a heterogeneous group of agents and actual average productivity is greater than the offered wage, the average productivity is priced below the market average. The same mispricing also occurs

if the offered compensation is lower than the actual average productivity of a heterogeneous group of agents in the market. This is called pre-contractual opportunism, and the same concept can be applied to banking example in which banks suffer from adverse selection by failing to select high-risk and low-risk borrowers. In order to deal with the adverse selection in hiring period, the thing that an agent can do is to share credible (and probably costly) information to principal as a signal to reduce the adverse selection problem and increases the corporate social responsibility performance in order to access to finance (Cheng et al., 2014; Spence, 1973).

1.3. Moral Hazard

After the period of establishing the contract, moral hazard problem may arise. The reason for the moral hazard problem is the agent who does not meet the terms and requirements of the contract and takes advantage of the private information on the cost of principal. The decision of taking excessive risk belongs to the agent. The purpose is to take advantage of information by taking an excessive risk against the principal. In this case, the cost may be transferred to the principal. In this setting, moral hazard is also called post-contractual opportunism. Accepting the terms and requirements of a contract by an agent makes the contract secured for a principal. Under this condition, if an agent has a higher incentive to take more risk, the cost will be transferred to the insurer, and the insurer will be the principal. In banking practice, deposit insurance has a similar functionality; the secured deposits may lead the shareholders to take excessive risk, and this may lead the cost of secured deposits on public (Dam and Koetter, 2012).

Monitoring and bonding the agent has been a popular topic and argued by the researchers for the last four decades (e.g., Ang et al., 2000; Bathala and Rao, 1995; Fama, 1980; Hill and Jones, 1992; Kunz and Pfaff, 2002; Lan and Heracleous, 2010; Nyberg et al., 2010). On the other hand, monitoring and bonding have a cost on principal. The incentive to take excessive risk is derived from the theoretical components of the principal-agent problem and depend on the recommended instruments of agency theory (Fama and Jensen, 1983).

2. Bank risk taking and incentive structures

The intermediation role of the banking system is a long argued topic in the related literature. Einarsson and Marquis (2001) point out that the need for financing working capital expenses leads the firms to generate short-term debt while the households are the primary source of the fund. They state that the banking system is still the primary mechanism to convert the funds from households and to transfer these funds to firms for their working capital needs. The main function of this mechanism that is used by banks is the ability to change the maturity of the fund from households to firms. Another important role of the banking system is to deal with the information asymmetry problem between borrowers and depositors (Fama, 1985; Leland and Pyle, 1977). Specifically, Diamond (1984) documents that the purpose of the intermediation of banking system is to monitor borrowers.

According to the implications of agency theory, banks may act as a principal and agent against different counterparts of the market; act as a principal against the borrowers and act as an agent against the depositors. In this set up of relations, banks monitor the borrowers and decide the level of risk-taking (Sufi, 2007).

2.1. Managerial incentives for excessive risk taking

After introduced by Berle and Means (1932), Fama and Jensen (1983) argue the separation of ownership and control in the theory of the firm to mitigate the principal and agency issues that arise in the form of conflict among counterparts. In this nexus, the main responsibility of an agent is to manage the affairs of the firm on a daily basis in an exchange of price that is constructed in the form of compensation at any capacity. The point of view that is introduced by Jensen and Meckling (1976) predicts that the presence of an incentive issue remains until the transfer of all shares to the agent. In other words, the incentive issue has no end before an agent turns into principal. In addition to the monitoring difficulties of shareholders, even having an equity-based compensation, which means to be a partial owner of the firm, may not lead the managers to provide maximum effort to meet the needs of shareholders. Managers may also have a secret agenda to maximise their needs. Under these conditions, managerial incentive issue is

tried to be solved by providing increased managerial shareholding, and equity-based compensation that consists of stock or stock options. The purpose is to minimise the managerial incentive issue by approximating the priorities of the manager to those of shareholders (Rogers, 2002).

It is mentioned that managerial preferences are not stable against different levels and complexity degrees of the risk. Jiménez et al. (2013) point out that large banks' risk diversification may lead the manager to take the benefit of the risk. On the other hand, the risk neutral preferences of the managers are highly correlated with the unobservable bank characteristics. The managerial acts are unobservable in different circumstances. The managers may not be eager to take risks at conditions that have negative effects on managers' human capital. On the other hand, faster growth opportunities on their human contagious capital may make the managers risk seekers. In addition to the human capital, the entrenchment of managers that denote the use of full power within the firm may be another reason that shapes the risk preferences of managers. By taking into consideration, the presence of managerial ownership and entrenchment concepts, Pagano (2001) discusses the scenarios related to the consequences of these two concepts. According to him, the relationship of these concepts is not linear in which the presence of them may trigger the severity of the principal-agent problem compared to their individual effects. Until the point of closest interests of managers and shareholders, equity-based compensation declines the problem and the managerial incentive issues on risk taking. Beyond that point, managers are free of monitoring by shareholders if their share ownership and entrenchment are too large in a bank.

2.2. Deposit insurance and risk taking incentive

The concept of 'lender of the last resort' is one of the most powerful intervention tools of central banks, especially in financial crisis periods (Drechsler et al., 2016). Besides, the deposit insurance that provides a safety net in the financial sector is designed to protect depositors and prevent bank panics. In order to prevent the contagious effect of an individual bank fails to other healthy financial institutions, deposit insurance protect individual depositors (Anginer et al., 2014). Diamond and Dybvig (1986, 1983) and Diamond and Rajan (2000) document the positive effect of deposit insurance in the period

of financial distress of a financial institution. In addition to the individual protection of depositors, deposit insurance has a functionality to promote the confidence and stability in financial markets: banks do not face any problem to transform deposit into loans by matching the different maturities if depositors feel in safe and have no priority to withdraw their deposit before the maturity date.

In addition to the functions of protecting depositors and establishing the confidence in financial markets, deposit insurance is also effective in risk sharing (Park, 1996). By extending the theoretical findings of Park (1996), Gropp and Vesela (2004) document the reduced risk-taking incentive and the presence of explicit deposit insurance. In a cross-country samples, Demirgüç-Kunt and Sobaci (2001) and Cull et al. (2005) document the usefulness of deposit insurance in domestic markets and support on institutional development.

Despite the fact that the positive effects of deposit insurance by protecting individual depositors from bank fails, increasing the confidence in financial markets, and supporting the institutional development, the moral hazard problem related to excessive risk taking is linked to the presence of deposit insurance by many scholars (e.g., Demirgüç-Kunt et al., 2015; Ngalawa et al., 2016; Schenck and Thornton, 2016). The secured depositors lose their interest in monitoring the management and the discipline of risk taking behaviour is vaporised. If the deposit insurance is underpriced, the 'option value of deposit insurance' appears for the banks and leads risk taking incentive of agents (Merton, 1977). In order to trigger the option value of deposit insurance, the agent of a bank that aims to equity maximisation takes an excessive risk when the option value of deposit insurance rises (Dothan and Williams, 1980; Kareken and Wallace, 1978; Sharpe, 1978). The limited liability of shareholders triggers the effect of option value of deposit insurance. Duran and Lozano-Vivas (2014) assess the risk shifting in pre-crisis and crisis periods in the recent financial crisis. Grossman (1992) document the gradually increased moral hazard problem as a result of the deposit insurance in thrifts institutions.

The critiques on the connection of moral hazard problem and deposit insurance are provided in the literature. Despite the expected lower capital ratios of the bank that suffers from moral hazard, the studies show that banks target capital ratio levels that are better

than the minimum requirements of regulators (Ayuso et al., 2004; Jokipii and Milne, 2008; Lindquist, 2004; Stolz and Wedow, 2011). Rather the expectation of underpriced deposit insurance, empirical studies show that deposit insurance is over-priced (Marcus and Shaked, 1984; Pennacchi, 1987; Ronn and Verma, 1986). On the other hand, the literature still provides contradictory results in the direction of the relationship between the deposit insurance and bank risk taking. Wheelock and Wilson (1995) and Demirgüç-Kunt and Detragiache (2002) finds a positive correlation between deposit insurance and risk taking while Gropp and Vesala (2004) detect the negative correlation. On the other hand, Hovakimian et al. (2002) and Bushman and Williams (2012) point out that the direction of the relationship depends on other variables.

2.3. Capital structure, regulatory requirements, and risk taking incentive

The presence of limited liability of shareholders and deposit insurance, which generate large gains to shareholders and large losses to depositor insurers, shape the modern bank risk taking models that aim to identify the payoff structure of risk taking. Two conceptual frameworks are designed to increase the stake of shareholders in a bank to converge their incentives to the deposit insurer's incentive. The first conceptual framework is related to accepting large stake by shareholders; shareholders hold the large stake in equity voluntarily. The second conceptual framework is related to forcing shareholders to accept large stake in equity.

The first conceptual framework that is related to holding stake voluntarily is designed as a policy that allows banks to earn monopoly rents. With this policy, bank chartering becomes valuable by collecting monopoly rent, and default cost of bank increases significantly. In this mechanism, the higher charter value of a bank and reputational loss of defaulting a valuable bank charting prevent from taking the excessive risk (Boyd and De Nicoló, 2005; Duchin and Sosyura, 2014; Laeven and Levine, 2009). Hellman et al. (2000) recommend this conceptual framework rather than applying a capital requirement to decline the failure risk.

The second conceptual framework that forcing shareholders to hold a large stake in equity is to set minimum capital requirements against risky assets. In order to eliminate the

incentives for excessive risk taking, setting a capital requirement provides an efficient mechanism against insolvency (Sharpe, 1978). On the other hand, the critiques on this framework advocate that regulations on capital requirements may increase the risk taking (Borio and Zhu, 2012; Gauthier et al., 2012; Koehn and Santomero, 1980). The findings of Gennotte and Pyle's (1991) theoretical study point out that the strict capital requirements decline the size of the bank portfolio and increase the portfolio risk simultaneously. Also, increasing capital requirements of banks that fully comply with the capital requirements has little effect on risk taking incentives until banks decline to the level of new minimum capital requirement level. In this condition, banks take excessive risks because of the moral hazard problem (Milne, 2002; Milne and Whalley, 1998).

2.4. Collateral requirements and risk taking incentive

In order to finance the working capital expenses, firms request loans from banks. The working capital expenses may cover an existing project or a new one. At this stage, the risk assessment of loan requests from borrowers becomes essential, due to the information asymmetry of the lender in credit markets. The risk assessment allows banks to decide the level of collateral and the interest rate that is applied to the loan requests of borrowers.

There are two types of collaterals that the lender can apply: (i) the collateral on the business on the borrower, (ii) collateral on the assets of the borrower. In cases of information asymmetry that denotes the unclear default probability of borrower, setting the amount of collateral becomes essential (Cerqueiro et al., 2016). Aghion and Bolton (1992) and Gonas et al. (2004) state that the purposes of collateral requirements vary from reducing the adverse selection of the bank to disciplining the borrowers. Berger and Udell (1990) state that the high level of collateral is also associated with risky loans and risky banks. The findings of Berger et al.'s (2011) study support the findings of Leeth and Scott's (1989) study that there is a positive relationship between the default risk of borrowers and the level of collateral.

The related literature that is exemplified with the important studies clearly states that collateral obligation allows banks to assess the risk level of borrowers and the projects that are potentially financed by loans. The monitoring of the bank can be strengthened

with the investigation that mitigates the adverse selection problem and reduces the credit risk as well.

2.5. Financial innovation, risk transferring technology, and risk taking incentive

The rapid growth of needs to diversified financial instruments, advanced information technology, and economic growth have been forcing the financial engineering to be 'innovative'. In emerging of derivatives, a product that allows transferring risk among counterparts, and exchange traded funds have pioneered the financial innovation during the last few decades. Gennaioli et al. (2012) define the financial innovation as result of investors' demand to safer and clear cash flows in markets. Tufano (2003) lists the functions of financial innovation: (i) increasing the cost efficiency of the markets, (ii) adopting the reactions of financial institutions against new regulations, (iii) responding the needs of investors in changing global environment, (iv) converging the counterparts from all over the world easily, and (v) managing the factor that affect the risk taking of the financial institutions. In this setting, banks are the industry pioneers to adopt new technologies and use new financial instruments that are quite new to the rest of the financial market.

Despite the advantages of financial innovation and technological progress in financial markets, the changing nature of the business forces banks to change their traditional lending and borrowing activities (Laeven et al., 2015). Additionally, financial innovations lead banks to move from traditional business activities that are affected by the interest rate risk, credit risk, and foreign exchange risk to non-traditional business fields that allow banks to collect fee payments from new services. According to Tufano (2003), fee payments of new services increase the earning of banks significantly, and financial innovation declines the cost of capital to finance businesses. In addition to the declined cost of capital, financial innovation allows banks to diversify the financial instruments and product they offer to clients (Calvet et al., 2003).

The derivative products have become the most important part of financial innovation in the last decades. The price of financial derivatives is 'derived' from the values of underlying assets (i.e., stocks, corporate loans, government bonds, certificates of deposit,

foreign currencies, bonds). According to the nature of financial derivatives, they are closely tied to the primary financial product, or the issued commodity (i.e., gold, corn, wheat, petroleum). In principal, the benefit of financial derivatives is not to require the transfer of ownership of the underlying asset; the presence of the financial derivative depends on the contract for a date in the future.

Different than the non-financial firms that have no maturity mismatching problems in their cash flows, financial firms, especially banks, take the risk of maturity mismatching in their transactions. In addition to the maturity mismatching, banks can face with more risks such as interest rate risk and exchange rate risk, compared to non-financial firms. As experienced in the recent financial crisis, the unexpected price declines in housing became the reason of the devaluation of housing-related securities (Acharya and Richardson, 2009).

Despite the recent financial crisis, financial derivatives are still essential to managing risks by hedging the asset and liability positions that banks take. Hedging their asset and liability positions allow banks to offset their losses on short or long positions in one market by gains of short or long positions in another one. In a theoretical study, Duffee and Zhou (2001) show that banks can use the credit derivatives to transfer their credit risk.

The derivative instruments may create moral hazard problem, which triggers the adverse selection problem in return. Similar to deposit insurance, the incentive for taking the excessive risk of the bank is higher; the banks can transfer the risk they face to the owner of the primary asset such like transferring the risk to deposit insurer. On the other hand, banks may act as a principal and may face the risks that are transferred from the user of the derivative of the banks. Cebenoyan and Strahan (2004) point out that banks are eager to hold less capital and ready to make risky loans if they are involved in the actively participated risk management by selling and purchasing loans.

Appendix B: List of Delisted Banks in the Sample

Table 20: The list of delisted US banks as of 31st of December 2015 and the date of delisting.

Bank Name	Delisting Date
1ST FINANCIAL SERVICES CORP	January 2014
1ST INDEPENDENCE FINANCIAL GROUP INC	September 2008
1ST MUTUAL BANCSHARES INC	February 2008
1ST PACIFIC BANCORP	February 2010
ABIGAIL ADAMS NATIONAL BANCORP	September 2009
ABINGTON BANCORP INC	October 2011
ABINGTON COMMUNITY BANCORP INC	June 2007
ACE CASH EXPRESS INC	October 2006
ALABAMA NATIONAL BANCORP	February 2008
ALLIANCE BANCORP INC OF PENNSYLVANIA	October 2015
ALLIANCE BANKSHARES CORP	December 2012
ALLIANCE FINANCIAL CORP	March 2013
AMCORE FINANCIAL INC	May 2010
AMEGY BANCORPORATION INC	December 2005
AMERICAN BANK INC	July 2007
AMERICAN COMMUNITY BANCSHARES INC	April 2009
AMERICANWEST BANCORP	March 2010
AMERICASBANK CORP	July 2008
AMSOUTH BANCORP	November 2006
ANNAPOLIS BANCORP INC	April 2013
APPALACHIAN BANCSHARES INC	October 2009
ATLANTIC BANCGROUP INC	November 2010
ATLANTIC SOUTHERN FINANCIAL GROUP INC	January 2011
BANCORP RHODE ISLAND INC	January 2012
BANCTRUST FINANCIAL GROUP INC	February 2013
BANK OF FLORIDA CORP	June 2010
BANK OF GRANITE CORP	October 2011
BANK OF KENTUCKY FINANCIAL CORP	June 2015
BANK OF MCKENNEY	December 2009
BANK OF THE CAROLINAS CORP	March 2012
BANK ONE CORP	July 2004
BANKGREENVILLE FINANCIAL CORP	July 2013
BANKUNITED FINANCIAL CORP	June 2009
BCSB BANCORP INC	February 2014
BEACH FIRST NATIONAL BANCSHARES INC	April 2010
BEACON FEDERAL BANCORP INC	October 2012
BENJAMIN FRANKLIN BANCORP INC	April 2009
BERKSHIRE BANCORP INC	November 2013
BEVERLY HILLS BANCORP INC	February 2009
BEVERLY NATIONAL CORP	October 2009
BFC FINANCIAL CORP	December 2008
BLUE RIVER BANCSHARES INC	September 2007
BNCCORP INC	January 2008
BOARDWALK BANCORP INC	February 2008
BOE FINANCIAL SERVICES OF VIRGINIA INC	June 2008
BRIDGE CAPITAL HOLDINGS	June 2015
BRIDGE STREET FINANCIAL INC	October 2006
BRITTON & KOONTZ CAPITAL CORP	July 2012
BROOKLYN FEDERAL BANCORP INC	January 2012
CADENCE FINANCIAL CORP	March 2011

CAMCO FINANCIAL CORP	February 2014
CAPITAL BANK CORP	September 2012
CAPITAL CORP OF THE WEST	February 2009
CAPITALSOURCE INC	April 2014
CAPITOL BANCORP LTD	January 2011
CAROLINA NATIONAL CORP	February 2008
CASCADE FINANCIAL CORP	June 2011
CAVALRY BANCORP INC	March 2006
CCF HOLDING CO	March 2009
CENTER FINANCIAL CORP	November 2011
CENTRAL BANCORP INC	November 2012
CENTRAL COAST BANCORP	February 2006
CENTRAL JERSEY BANCORP	December 2010
CENTRAL VIRGINIA BANKSHARES INC	May 2012
CENTRUE FINANCIAL CORP	June 2011
CFS BANCORP INC	November 2013
CHARTER ONE FINANCIAL INC	September 2004
CHITTENDEN CORP	January 2008
CITIZENS FIRST BANCORP INC	February 2010
CITIZENS REPUBLIC BANCORP INC	April 2013
CITIZENS SOUTH BANKING CORP	October 2012
CMS BANCORP INC	April 2015
CNB BANCORP INC	February 2012
COAST FINANCIAL HOLDINGS INC	December 2007
COLONIAL BANCGROUP INC	August 2009
COLUMBIA BANCORP INC	February 2006
COMM BANCORP INC	January 2011
COMMERCE BANCORP INC	March 2008
COMMERCIAL BANKSHARES INC	June 2007
COMMERCIAL NATIONAL FINANCIAL CORP	June 2012
COMMONWEALTH BANKSHARES INC	October 2011
COMMUNITY BANKS INC PA	November 2007
COMMUNITY CAPITAL CORP	October 2011
COMMUNITY CENTRAL BANK CORP	April 2011
COMMUNITY FINANCIAL CORP/ VA	January 2013
COMMUNITY FINANCIAL SHARES INC	July 2015
COMMUNITY SHORES BANK CORP	December 2010
COMPASS BANCSHARES INC	September 2007
CONCORD EFS INC	February 2004
CONNECTICUT BANK & TRUST CO	April 2012
COOPERATIVE BANKSHARES INC	July 2009
CORNERSTONE BANCORP INC	January 2006
CORUS BANKSHARES INC	September 2009
COWLITZ BANCORP	July 2010
CRESCENT BANKING CO	July 2010
DEARBORN BANCORP INC	November 2011
DFC GLOBAL CORP	June 2014
DOWNEY FINANCIAL CORP	November 2008
EAST PENN FINANCIAL CORP	November 2007
ECB BANCORP INC	April 2013
ESB FINANCIAL CORP	February 2015
FEDERAL TRUST CORP	November 2008
FEDFIRST FINANCIAL CORP	October 2014
FFD FINANCIAL CORP	June 2012
FIDELITY BANCORP INC	November 2012
FIDELITY BANKSHARES INC	January 2007
FIRST BANCORP OF INDIANA INC	May 2008
FIRST BANCTRUST CORP	October 2008

FIRST CALIFORNIA FINANCIAL GROUP INC	May 2013
FIRST CENTURY BANKSHARES INC	April 2012
FIRST CHARTER CORP	June 2008
FIRST FEDERAL BANCSHARES INC DEL	March 2007
FIRST FEDERAL BANKSHARES INC	September 2009
FIRST FINANCIAL HOLDINGS INC	July 2013
FIRST FINANCIAL SERVICE CORP	January 2015
FIRST FRANKLIN CORP	March 2011
FIRST INDIANA CORP	January 2008
FIRST KEYSTONE FINANCIAL INC	July 2010
FIRST LITCHFIELD FINANCIAL CORP	April 2010
FIRST M & F CORP	September 2013
FIRST MARINER BANCORP INC	September 2011
FIRST NATIONAL BANCSHARES INC	July 2010
FIRST OAK BROOK BANCSHARES INC	August 2006
FIRST PLACE FINANCIAL CORP OHIO	November 2011
FIRST REGIONAL BANCORP	February 2010
FIRST STATE BANCORP	July 2010
FIRST STATE FINANCIAL CORP	August 2009
FIRSTBANK CORP	June 2014
FIRSTBANK NW CORP	December 2006
FIRSTFED FINANCIAL CORP	March 2009
FLAG FINANCIAL CORP	December 2006
FLEET BOSTON FINANCIAL CORP	April 2004
FMS FINANCIAL CORP	July 2007
FNB CORP VA	February 2008
FNB FINANCIAL SERVICES CORP	August 2007
FOOTHILL INDEPENDENT BANCORP	May 2006
FRONTIER FINANCIAL CORP	May 2010
G B & T BANCSHARES INC	May 2008
GOLDEN WEST FINANCIAL CORP	October 2006
GREAT FLORIDA BANK	May 2010
GREAT LAKES BANCORP INC	February 2008
GREAT PEE DEE BANCORP INC	April 2008
GREATER ATLANTIC FINANCIAL CORP	February 2007
GREATER BAY BANCORP	October 2007
GREATER COMMUNITY BANCORP	July 2008
GREEN BANKSHARES INC	September 2012
GREENPOINT FINANCIAL CORP	October 2004
GS FINANCIAL CORP	July 2011
HABERSHAM BANCORP	December 2009
HAMPDEN BANCORP INC	April 2015
HARBOR FLORIDA BANCSHARES INC	December 2006
HARLEYSVILLE NATIONAL CORP	April 2010
HARLEYSVILLE SAVINGS FINANCIAL CORP	December 2012
HARRINGTON WEST FINANCIAL GROUP INC	December 2009
HERITAGE FINANCIAL GROUP INC	July 2015
HIBERNIA CORP	November 2005
HOME CITY FINANCIAL CORP	December 2006
HOME FEDERAL BANCORP INC	May 2014
HORIZON FINANCIAL CORP	January 2010
HUDSON UNITED BANCORP	February 2006
HUDSON VALLEY HOLDING CORP	June 2015
IBT BANCORP INC	June 2008
IMPERIAL CAPITAL BANCORP INC	December 2008
INDYMAC BANCORP INC	July 2008
INTEGRA BANK CORP	May 2011
INTERCHANGE FINANCIAL SERVICES CORP	January 2007

INTERVEST BANCSHARES CORP	February 2015
INVESTORS FINANCIAL SERVICES CORP	July 2007
IRWIN FINANCIAL CORP	September 2009
JEFFERSONVILLE BANCORP	June 2012
KNBT BANCORP INC	February 2008
LEHMAN BROTHERS HOLDINGS INC	September 2008
LIBERTY BANCORP INC	March 2010
LINCOLN BANCORP	January 2009
LNB BANCORP INC	August 2015
LSB CORP	December 2010
LSB FINANCIAL CORP	November 2014
MAF BANCORP INC	September 2007
MAIN STREET BANKS INC	June 2006
MAINSTREET BANKSHARES INC	January 2015
MARSHALL & ILSLEY CORP	July 2011
MASSBANK CORP	September 2008
MAYFLOWER BANCORP INC	November 2013
MBNA CORP	December 2005
MELLON FINANCIAL CORP	July 2007
MERCANTILE BANCORP INC ILL	December 2011
MERCANTILE BANKSHARES CORP	March 2007
MERRILL MERCHANTS BANCSHARES INC	June 2007
METROCORP BANCSHARES INC	January 2014
MFB CORP	July 2008
MID WISCONSIN FINANCIAL SERVICES INC	April 2013
MIDCAROLINA FINANCIAL CORP	July 2011
MID-STATE BANCSHARES	May 2007
MIDWEST BANC HOLDINGS INC	May 2010
MISSION COMMUNITY BANCORP	February 2014
MONROE BANCORP	January 2011
NASB FINANCIAL INC	September 2014
NATIONAL CITY CORP	December 2008
NATIONAL COMMERCE FINANCIAL CORP	October 2004
NB & T FINANCIAL GROUP INC	March 2015
NETBANK INC	August 2007
NEWALLIANCE BANCSHARES INC	April 2011
NEWMIL BANCORP INC	October 2006
NEXITY FINANCIAL CORP	February 2009
NORTH CENTRAL BANCSHARES INC	June 2012
NORTH FORK BANCORP INC	December 2006
NORTH PENN BANCORP INC	May 2011
NORTH VALLEY BANCORP	October 2014
NORTHERN EMPIRE BANCSHARES	March 2007
NORTHERN STATES FINANCIAL CORP	February 2012
NORTHWAY FINANCIAL INC	September 2007
OAK HILL FINANCIAL INC	December 2007
OHIO LEGACY CORP	October 2012
OMEGA FINANCIAL CORP	April 2008
OMNI FINANCIAL SERVICES INC	July 2008
OSAGE BANCSHARES INC	March 2010
PAB BANKSHARES INC	May 2011
PACIFIC CAPITAL BANCORP	December 2012
PAMRAPO BANCORP INC	July 2010
PARK BANCORP INC	December 2011
PARKVALE FINANCIAL CORP	January 2012
PATAPSCO BANCORP INC	August 2015
PELICAN FINANCIAL INC	April 2006
PENNFED FINANCIAL SERVICES INC	April 2007

PENSECO FINANCIAL SERVICES CORP	November 2013
PEOPLES BANCORP	March 2008
PEOPLES BANCORPORATION INC	April 2012
PEOPLES BANCTRUST CO INC	October 2007
PEOPLES COMMUNITY BANCORP INC	August 2009
PFF BANCORP INC	July 2008
PINNACLE BANCSHARES INC	February 2008
PREMIER COMMUNITY BANKSHARES INC	July 2007
PREMIERWEST BANCORP INC	April 2013
PRINCETON NATIONAL BANCORP INC	June 2012
PROVIDENT BANKSHARES CORP	May 2009
PROVIDENT COMMUNITY BANCSHARES INC	November 2011
PVF CAPITAL CORP	October 2013
RAINIER PACIFIC FINANCIAL GROUP INC	March 2010
RELIANT BANK	April 2015
REPUBLIC BANCORP INC	December 2006
ROEBLING FINANCIAL CORP INC	July 2013
ROME BANCORP INC	April 2011
SAVANNAH BANCORP INC	December 2012
SECURITY BANK CORP	August 2009
SHORE FINANCIAL CORP	June 2008
SIMPLICITY BANCORP INC	March 2015
SKY FINANCIAL GROUP INC	July 2007
SLADES FERRY BANCORP	March 2008
SMITHTOWN BANCORP INC	December 2010
SNB BANCSHARES INC	April 2006
SOMERSET HILLS BANCORP	May 2013
SOUND FEDERAL BANCORP INC	July 2006
SOUTH FINANCIAL GROUP INC	October 2010
SOUTH STREET FINANCIAL CORP	April 2007
SOUTHERN COMMUNITY FINANCIAL CORP	October 2012
SOUTHERN CONNECTICUT BANCORP INC	June 2013
SOUTHFIRST BANCSHARES INC	March 2006
SOUTHTRUST CORP	November 2004
STATE BANCORP INC	January 2012
STATEN ISLAND BANCORP INC	April 2004
STELLARONE CORP	January 2014
STERLING BANCORP	October 2013
STERLING BANCSHARES INC	July 2011
STERLING BANKS INC	July 2010
STERLING FINANCIAL CORP	April 2008
STERLING FINANCIAL CORP	April 2014
SUN AMERICAN BANCORP	December 2009
SUPERIOR BANCORP	April 2011
SUSQUEHANNA BANCSHARES INC	August 2015
TAYLOR CAPITAL GROUP INC	August 2014
TD BANKNORTH INC	April 2007
TEAM FINANCIAL INC	March 2009
TECHE HOLDING CO	May 2014
TEMECULA VALLEY BANCORP INC	July 2009
TENNESSEE COMMERCE BANCORP INC	February 2012
TEXAS REGIONAL BANCSHARES INC	November 2006
TF FINANCIAL CORP	October 2014
THE BANK HOLDINGS	September 2009
TIB FINANCIAL CORP	September 2012
TIDELANDS BANCSHARES INC	June 2011
TIERONE CORP	May 2010
TOWER FINANCIAL CORP	April 2014

UCBH HOLDINGS INC	November 2009
UNION COMMUNITY BANCORP	March 2006
UNION PLANTERS CORP	July 2004
UNITED FINANCIAL CORP MINNESOTA	February 2007
UNITED PANAM FINANCIAL CORP	July 2009
UNIVERSITY BANCORP INC	January 2009
USB HOLDING COMPANY INC	January 2008
VALLEY BANCORP	October 2006
VALLEY FINANCIAL CORP	July 2015
VANTAGESOUTH BANCSHARES INC	July 2014
VINEYARD NATIONAL BANCORP	April 2009
VIRGINIA COMMERCE BANCORP INC	January 2014
VIST FINANCIAL CORP	August 2012
VSB BANCORP INC	December 2013
WACCAMAW BANKSHARES INC	November 2011
WACHOVIA CORP	December 2008
WAINWRIGHT BANK & TRUST CO	November 2010
WASHINGTON BANKING CO	May 2014
WASHINGTON MUTUAL INC	September 2008
WEST COAST BANCORP OR	April 2013
WEST CORP	March 2006
WESTBANK CORP	January 2007
WESTERN SIERRA BANCORP	June 2006
WGNB CORP	September 2009
WHITNEY HOLDING CORP	June 2011
WILBER CORP	April 2011
WILLOW FINANCIAL BANCORP INC	December 2008
WILMINGTON TRUST CORP	May 2011
WSB FINANCIAL GROUP INC	May 2009
WSB HOLDINGS INC	May 2013
YARDVILLE NATIONAL BANCORP	October 2007

Source: SNL Financial, BoardEx

Appendix C: Results of Hausman Test

Table 21: Hausman Test results

The Hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. Executive Network Size is calculated from the average network sizes of board members and CEOs of each bank. Executive Tenure is calculated from the tenure of board members and CEOs of each bank. CEO Network Size is calculated from the network sizes of CEOs of each bank. CEO Tenure is calculated from the tenures of CEOs of each bank.			
H_0: Differences in coefficients are not systematic			
Bank risk variable	Independent variable	chi2	Prob>chi2
Z score	CEO Tenure	108.1800	0.0000
	CEO Network Size	455.1300	0.0003
	CEO Tenure & CEO Network Size	588.9100	0.0000
Systematic risk	CEO Tenure	98.7800	0.0000
	CEO Network Size	101.1500	0.0000
	CEO Tenure & CEO Network Size	53.5800	0.0000
Systemic risk	CEO Tenure	110.3600	0.0000
	CEO Network Size	198.4800	0.0000
	CEO Tenure & CEO Network Size	84.1000	0.0009
Z score	Executive Tenure	442.1800	0.0004
	Executive Network Size	362.6700	0.0001
	Executive Tenure & Executive Network Size	583.9100	0.0000
Systematic risk	Executive Tenure	145.1900	0.0000
	Executive Network Size	117.0700	0.0000
	Executive Tenure & Executive Network Size	63.4300	0.0000
Systemic risk	Executive Tenure	127.9700	0.0000
	Executive Network Size	100.9600	0.0000
	Executive Tenure & Executive Network Size	122.0000	0.0002

Appendix D: Results of Estimations for Executives

Table 22: Fixed effects and generalised method of movements (GMM) estimations - Executive power and bank risk: Z-score results

This table reports fixed effects and GMM estimation results. Columns 1,2, 4, and 5 report the estimated relations between individual executive power variables (executive tenure and executive network size) and bank risk, and Column 3 and 6 report the estimated relations between two executive power variables and dependent variable. Bank risk is measured by Z-score. Z-score is the inverse of the ratio of return on assets plus capital assets ratio divided by standard deviation of return on assets at given year. Executive tenure is the average number of years the CEO and board members have served in a position at given year. Executive network size is the average number of network nodes that the CEO and board member have at given year. Executive power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Fixed effect			GMM		
	Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Lag of dependent variable				0.4703***	0.4653***	0.4644***
					(0.013)	(0.016)	(0.016)
Exe. power	Executive Tenure	0.5184*		0.6052**	2.0166***		0.1675***
		(0.265)		(0.237)	(0.224)		(0.061)
	Executive Network Size		0.4795***	0.7870***		0.6486**	0.5600**
			(0.121)	(0.154)		(0.282)	(0.278)
CEO related	CEO Age	-0.1030	-0.4029	-0.3259	-0.4997***	-0.3536*	-0.4383**
		(0.332)	(0.406)	(0.381)	(0.187)	(0.197)	(0.195)
	CEO Gender	-0.5341*	-0.3502*	-0.3158*	-0.1054	-0.0778	-0.0592
		(0.282)	(0.205)	(0.189)	(0.105)	(0.134)	(0.133)
	CEO Experience	-0.1384**	-0.0296	-0.0407	-0.0172	-0.0368*	-0.0350
		(0.069)	(0.051)	(0.053)	(0.022)	(0.022)	(0.022)
	CEO Education	-0.2401	-0.2072	-0.0310	-0.1017	-0.2477	-0.2418
		(0.233)	(0.145)	(0.170)	(0.189)	(0.181)	(0.180)
Board related	Board Size	-0.1259***	-0.0790***	-0.0780***	-0.0765***	-0.0521***	-0.0510**
		(0.037)	(0.024)	(0.029)	(0.019)	(0.020)	(0.020)
	Board Independence	-0.4705**	-1.0604**	-2.2023***	-1.0578*	-0.4568	-0.5850
		(0.213)	(0.512)	(0.574)	(0.595)	(0.727)	(0.720)
Bank specific	Liquidity	-0.0679***	-0.0073	-0.0266***	-0.0024	-0.0015	-0.0021
		(0.011)	(0.008)	(0.008)	(0.002)	(0.002)	(0.002)
	Leverage	-0.0142	-0.0389***	-0.0278**	-0.0072***	-0.0044*	-0.0047*
		(0.012)	(0.013)	(0.011)	(0.002)	(0.003)	(0.003)
	Loan Provision	1.1251***	0.7437***	0.6665***	0.0988***	0.0776*	0.0722*
		(0.179)	(0.132)	(0.136)	(0.036)	(0.044)	(0.043)
	Capital-Asset Ratio	-0.3838***	-0.6654***	-0.5982***	-0.2520***	-0.2129***	-0.2082***
		(0.098)	(0.047)	(0.065)	(0.013)	(0.012)	(0.011)
	Cost-to-Income	-0.0008	-0.0054***	-0.0047***	-0.0063***	-0.0061***	-0.0056***
		(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	-0.8078***	-0.5673***	-0.5278***	-0.5346***	-0.5370***	-0.5392***
		(0.046)	(0.032)	(0.031)	(0.036)	(0.039)	(0.039)
	Size	1.6384***	1.1463***	1.8115***	0.3689*	1.3828***	1.1444**
		(0.310)	(0.170)	(0.219)	(0.191)	(0.488)	(0.485)
Ownership related	Institutional Investment	0.0330***	0.0161***	0.0221***	0.0289***	0.0263***	0.0258***
		(0.007)	(0.005)	(0.006)	(0.004)	(0.004)	(0.004)
	Individual Investment	-0.0043	-0.0121	-0.0077	-0.0093	-0.0030	-0.0040
		(0.019)	(0.008)	(0.011)	(0.009)	(0.010)	(0.010)
	HH-Index	0.7899	0.8078	0.4625	1.2168	1.9003***	1.7474***
		(0.945)	(0.779)	(0.876)	(1.051)	(0.649)	(0.664)
	Financial Crisis Dummy	0.2366***	2.4281***	2.1243***	1.6831***	1.9529***	1.9674***
		(0.085)	(0.076)	(0.071)	(0.047)	(0.072)	(0.071)
	N	4983	4983	4982	3733	3690	3690
	R2 overall	0.1933	0.1704	0.1885			
Hansen test (2nd step; p-value)					0.126	0.988	0.999
Arellano-Bond test AR(2) (p-value)					0.149	0.103	0.138

Table 23: Fixed effects and generalised method of movements (GMM) estimations - Executive power and bank risk: systematic risk indicator results

This table reports fixed effects and GMM estimation results. Columns 1,2, 4, and 5 report the estimated relations between individual executive power variables (executive tenure and executive network size) and bank risk, and Column 3 and 6 report the estimated relations between two executive power variables and dependent variable. Bank risk is measured by systematic risk. Systematic risk is the average non-overlapping beta in capital asset pricing model calculated for each bank at given year. Executive tenure is the average number of years the CEO and board members have served in a position at given year. Executive network size is the average number of network nodes that the CEO and board member have at given year. Executive power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Fixed effect			GMM		
	Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Lag of dependent variable				0.0618*	0.0725**	0.0875***
					(0.035)	(0.034)	(0.032)
Exe. power	Executive Tenure	0.1081*		0.1309**	0.5915**		0.3744***
		(0.060)		(0.059)	(0.289)		(0.130)
	Executive Network Size		0.0827**	0.0800**		0.1353***	0.0992*
			(0.033)	(0.032)		(0.049)	(0.053)
CEO related	CEO Age	-0.3015*	-0.2645*	-0.0462	-0.3630***	-0.2871	-0.0883
		(0.176)	(0.138)	(0.147)	(0.122)	(0.184)	(0.145)
	CEO Gender	-0.3146*	-0.0143	-0.0898	-0.8292***	-1.0977***	-0.5897
		(0.171)	(0.145)	(0.148)	(0.308)	(0.297)	(0.610)
	CEO Experience	-0.0358***	-0.0388**	-0.0270	-0.0356	-0.5451***	-0.0198
		(0.013)	(0.017)	(0.019)	(0.044)	(0.149)	(0.039)
	CEO Education	-0.0728	-0.0327	-0.0242	-0.2604	-0.4145**	-0.0534
		(0.068)	(0.068)	(0.051)	(0.213)	(0.208)	(0.209)
Board related	Board Size	-0.0115**	-0.0180***	-0.0079	-0.0048	-0.0158*	-0.0711
		(0.005)	(0.007)	(0.008)	(0.014)	(0.008)	(0.063)
	Board Independence	-0.2959	-0.4023**	-0.1541	-1.2147**	-0.5173	-0.2131
		(0.190)	(0.165)	(0.173)	(0.573)	(0.374)	(0.334)
Bank specific	Liquidity	-0.0054**	-0.0034	-0.0076***	-0.0012	-0.0011	-0.0020**
		(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
	Leverage	-0.0097***	-0.0084***	-0.0044*	-0.0067	-0.0067**	-0.0096***
		(0.003)	(0.002)	(0.003)	(0.004)	(0.003)	(0.003)
	Loan Provision	0.0211	0.0356**	0.0219	0.1275	0.0213	0.0421
		(0.029)	(0.017)	(0.035)	(0.094)	(0.080)	(0.081)
	Capital-Asset Ratio	-0.0042	-0.0007	-0.0103	-0.0036	-0.0489**	-0.0636***
		(0.005)	(0.005)	(0.006)	(0.005)	(0.021)	(0.018)
	Cost-to-Income	-0.0009	-0.0013*	-0.0001	-0.0036***	-0.0029***	-0.0032***
		(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
	ROA	-0.0253**	-0.0327***	-0.0184**	-0.0108	-0.0095*	-0.0214*
		(0.012)	(0.010)	(0.009)	(0.019)	(0.005)	(0.011)
	Size	0.3169***	0.5137***	0.4104***	0.2286***	0.2226***	0.1804***
		(0.069)	(0.050)	(0.057)	(0.023)	(0.024)	(0.023)
Ownership related	Institutional Investment	0.0033*	0.0041**	0.0043**	0.0107	0.0042	0.0044
		(0.002)	(0.002)	(0.002)	(0.008)	(0.004)	(0.008)
	Individual Investment	-0.0012	-0.0026	-0.0019	-0.0858***	-0.0637***	-0.0557***
		(0.003)	(0.002)	(0.003)	(0.021)	(0.022)	(0.018)
	HH-Index	-0.1165	-0.3424	-0.0616	0.4446	-0.6291	-0.6827
		(0.256)	(0.259)	(0.246)	(0.569)	(0.591)	(0.456)
	Financial Crisis Dummy	-0.0064	0.1265***	0.0104	-0.0997**	-0.0973***	-0.1883***
		(0.025)	(0.026)	(0.025)	(0.040)	(0.037)	(0.042)
	N	4981	4985	4981	3695	3731	3731
	R2 overall	0.2372	0.2382	0.2378			
Hansen test (2nd step; p-value)					0.608	0.750	0.516
Arellano-Bond test AR(2) (p-value)					0.301	0.349	0.187

Table 24: Fixed effects and generalised method of movements (GMM) estimations – Executive power and bank risk: systemic risk indicator results

This table reports fixed effects and GMM estimation results. Columns 1,2, 4, and 5 report the estimated relations between individual executive power variables (executive tenure and executive network size) and bank risk, and Column 3 and 6 report the estimated relations between two executive power variables and dependent variable. Bank risk is measured by systemic risk. Systemic risk the marginal expected shortfall of each bank in 5% worst days of the market at given year. Executive tenure is the average number of years the CEO and board members have served in a position at given year. Executive network size is the average number of network nodes that the CEO and board member have at given year. Executive power, CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Fixed effect			GMM		
	Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Lag of dependent variable				0.3905***	0.4147***	0.4034***
					(0.022)	(0.030)	(0.030)
Exe. power	Executive Tenure	0.6830*		0.3699*	0.1481*		0.6698***
		(0.386)		(0.210)	(0.081)		(0.242)
	Executive Network Size		0.4301**	0.5410*		0.0913**	0.1778***
			(0.165)	(0.281)		(0.046)	(0.056)
CEO related	CEO Age	-0.3230	-1.0755**	-0.3859	-0.1129	-0.1985**	-0.1281
		(0.772)	(0.519)	(1.461)	(0.084)	(0.092)	(0.089)
	CEO Gender	-2.5058***	-0.653	-0.4570	-0.7209***	-0.8082***	-0.7747***
		(0.898)	(0.828)	(1.182)	(0.216)	(0.273)	(0.268)
	CEO Experience	-0.0841	-0.0621	-0.2187	-0.2757***	-0.4523***	-0.3481***
		(0.176)	(0.094)	(0.164)	(0.078)	(0.123)	(0.123)
	CEO Education	-0.3644	-0.2545	-0.2018	-0.0234	-0.2445**	-0.1279
		(0.457)	(0.352)	(0.485)	(0.200)	(0.119)	(0.115)
Board related	Board Size	-0.1388**	-0.0067	-0.0418	-0.0454	-0.0128	-0.0175
		(0.069)	(0.036)	(0.045)	(0.036)	(0.013)	(0.013)
	Board Independence	-3.4940**	-3.0341***	-1.5023	-1.4575***	-1.1363***	-1.0902***
		(1.716)	(1.009)	(1.079)	(0.389)	(0.369)	(0.384)
Bank specific	Liquidity	-0.0232**	-0.0001	-0.0058	-0.0001	-0.0001	-0.0163**
		(0.010)	(0.010)	(0.011)	(0.001)	(0.001)	(0.008)
	Leverage	-0.0654***	-0.0297**	-0.0593***	-0.0002	-0.0023	-0.0029
		(0.020)	(0.013)	(0.015)	(0.001)	(0.002)	(0.002)
	Loan Provision	0.8187***	0.6240***	0.6467*	0.0721	0.2501***	0.2806***
		(0.242)	(0.170)	(0.339)	(0.058)	(0.093)	(0.088)
	Capital-Asset Ratio	-0.0755	-0.0013	-0.0437	-0.0019	-0.0133	-0.0241*
		(0.053)	(0.019)	(0.033)	(0.003)	(0.012)	(0.012)
	Cost-to-Income	-0.0004	-0.0041	-0.0045	-0.0013*	-0.0020***	-0.0024***
		(0.004)	(0.003)	(0.008)	(0.001)	(0.001)	(0.001)
	ROA	-0.0873**	-0.1544***	-0.0970	-0.0393	-0.002	-0.0189
		(0.037)	(0.040)	(0.124)	(0.027)	(0.005)	(0.015)
	Size	1.8359***	1.0169***	0.8964***	0.2393**	0.3044**	0.3248**
		(0.492)	(0.278)	(0.280)	(0.116)	(0.140)	(0.147)
Ownership related	Institutional Investment	0.0498***	0.0117*	0.0149*	0.0062***	0.0053	0.0028
		(0.009)	(0.007)	(0.008)	(0.002)	(0.008)	(0.008)
	Individual Investment	-0.0382	-0.0266	-0.0064	-0.0016	-0.0340*	-0.0449***
		(0.029)	(0.017)	(0.017)	(0.001)	(0.018)	(0.017)
	HH-Index	0.6264	-0.6686	0.9806	-0.3889	0.0919	0.1624
		(1.613)	(1.233)	(1.742)	(0.415)	(0.438)	(0.410)
	Financial Crisis Dummy	0.4623***	0.2312**	-0.6478***	-0.0814**	-0.1112***	-0.0854**
		(0.172)	(0.097)	(0.139)	(0.034)	(0.033)	(0.040)
	N	4982	4986	4682	3801	3671	3655
	R2 overall	0.1508	0.1504	0.1501			
Hansen test (2nd step; p-value)					0.271	0.437	0.501
Arellano-Bond test AR(2) (p-value)					0.641	0.000	0.000

Appendix E: Results of Estimations for pre-Dodd-Frank Sample

Table 25: Fixed effects and generalised method of movements (GMM) estimations - CEO power and bank risk before the Dodd-Frank Act of 2010: Z-score results

This table reports fixed effects and GMM estimation results. Columns 1,2, 4, and 5 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 and 6 report the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by Z-score. Z-score is the inverse of the ratio of return on assets plus capital assets ratio divided by standard deviation of return on assets at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period before the pass of Dodd-Frank Act of 2010 is from 1998 to 2010. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Fixed effect			GMM		
	Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Lag of dependent variable				0.4102***	0.3795***	0.3917***
					(0.017)	(0.017)	(0.020)
CEO power	CEO Tenure	0.2309***		0.1532*	0.1497***		0.1873**
		(0.080)		(0.083)	(0.056)		(0.089)
	CEO Network Size		0.0852**	0.4249***		0.2208***	0.2277*
			(0.041)	(0.118)		(0.079)	(0.125)
CEO related	CEO Age	-0.3048	-0.150	-0.7711	-0.1054	-0.4668	-2.1388
		(0.411)	(0.364)	(0.776)	(0.510)	(0.522)	(1.585)
	CEO Gender	-0.2231	-0.9598***	-1.5408**	-0.2506	-0.4419***	-0.4745***
		(0.616)	(0.307)	(0.712)	(0.171)	(0.147)	(0.158)
	CEO Experience	-0.1532	-0.0357	-0.0909	-0.0026	-0.0445	-0.9006***
		(0.135)	(0.077)	(0.132)	(0.032)	(0.031)	(0.234)
	CEO Education	-0.1648	-0.3143	-0.0202	-0.1065	-0.0403	-2.1486***
		(0.420)	(0.239)	(0.308)	(0.379)	(0.227)	(0.747)
Board related	Board Size	-0.0625*	-0.0670**	-0.0318	-0.0910***	-0.1976***	-0.1277***
		(0.035)	(0.031)	(0.044)	(0.028)	(0.046)	(0.018)
	Board Independence	-5.6324***	-0.6260	-2.9835***	-0.8611	-2.1544***	-0.8915
		(1.101)	(0.804)	(1.099)	(0.713)	(0.812)	(1.042)
Bank specific	Liquidity	-0.0812***	-0.0050	-0.0209	-0.0001	-0.0001	-0.0305***
		(0.020)	(0.005)	(0.016)	(0.003)	(0.003)	(0.012)
	Leverage	-0.0419	-0.0374***	-0.0263	-0.0239***	-0.0230**	-0.0265**
		(0.026)	(0.012)	(0.026)	(0.009)	(0.009)	(0.011)
	Loan Provision	0.9295***	0.3333*	2.7194***	0.0113	0.0519	0.0371
		(0.204)	(0.171)	(0.539)	(0.067)	(0.074)	(0.074)
	Capital-Asset Ratio	-0.5402***	-0.6991***	-0.7615***	-0.1550***	-0.1328***	-0.1529***
		(0.143)	(0.142)	(0.158)	(0.016)	(0.014)	(0.015)
	Cost-to-Income	-0.0042	-0.0028	-0.0120**	-0.0029*	-0.0016	-0.0017
		(0.003)	(0.003)	(0.005)	(0.002)	(0.001)	(0.002)
	ROA	-0.8215***	-0.5057***	-0.2638***	-0.6051***	-0.5741***	-0.5926***
		(0.061)	(0.042)	(0.090)	(0.038)	(0.038)	(0.042)
	Size	2.4400***	2.9647***	2.0544***	0.1749	0.0060	0.2514
		(0.533)	(0.331)	(0.504)	(0.200)	(0.046)	(0.253)
Ownership related	Institutional Investment	0.0387***	0.0250***	0.0332**	0.0187***	0.0191***	0.0287***
		(0.011)	(0.009)	(0.013)	(0.006)	(0.006)	(0.007)
	Individual Investment	-0.0322	-0.0071	-0.0193	-0.0185*	-0.0147	-0.0210*
		(0.028)	(0.013)	(0.020)	(0.011)	(0.011)	(0.012)
	HH-Index	-1.1542	-1.7781	-0.8717	3.1071**	0.2697	2.0713
		(3.086)	(2.248)	(3.687)	(1.219)	(1.196)	(1.277)
	Financial Crisis Dummy	2.0216***	3.2282***	2.7205***	1.4981***	1.4016***	1.4556***
		(0.127)	(0.095)	(0.148)	(0.045)	(0.051)	(0.065)
	N	3330	3330	3330	2216	2219	2207
	R2 overall	0.0912	0.0915	0.0917			
Hansen test (2nd step; p-value)					0.283	0.403	0.525
Arellano-Bond test AR(2) (p-value)					0.345	0.350	0.369

Table 26: Fixed effects and generalised method of movements (GMM) estimations - CEO power and bank risk before the Dodd-Frank Act of 2010: systematic risk indicator results

This table reports fixed effects and GMM estimation results. Columns 1,2, 4, and 5 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 and 6 report the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by systematic risk. Systematic risk is the average non-overlapping beta in capital asset pricing model calculated for each bank at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period before the pass of Dodd-Frank Act of 2010 is from 1998 to 2010. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Fixed effect			GMM		
	Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Lag of dependent variable				0.1641***	0.2014***	0.1922***
					(0.053)	(0.047)	(0.055)
CEO power	CEO Tenure	0.0184**		0.0177*	0.1703***		0.1938**
		(0.009)		(0.009)	(0.061)		(0.076)
	CEO Network Size		0.0496**	0.0506**		0.0740**	0.1994***
			(0.024)	(0.025)		(0.032)	(0.060)
CEO related	CEO Age	-0.1418	-0.0896	-0.2055	-0.4138***	-0.2186	-0.1792
		(0.252)	(0.256)	(0.253)	(0.158)	(0.162)	(0.185)
	CEO Gender	-0.1357	-0.1861	-0.2081	-0.1760	-0.1705	-0.2126
		(0.177)	(0.195)	(0.185)	(0.112)	(0.114)	(0.139)
	CEO Experience	-0.0104	-0.0216	-0.0209	-0.0347*	-0.0301	-0.0393*
		(0.029)	(0.028)	(0.028)	(0.020)	(0.022)	(0.021)
	CEO Education	-0.0248	-0.1363**	-0.0220	-0.8102***	-0.0306	-0.3492***
		(0.092)	(0.064)	(0.093)	(0.199)	(0.078)	(0.124)
Board related	Board Size	-0.0074	-0.0060	-0.0054	-0.0871***	-0.0623***	-0.0789***
		(0.011)	(0.011)	(0.011)	(0.022)	(0.015)	(0.021)
	Board Independence	-0.7188***	-0.5226**	-0.5537**	-3.5499***	-3.8307***	-3.2122***
		(0.258)	(0.250)	(0.252)	(1.181)	(0.822)	(0.986)
Bank specific	Liquidity	-0.0100***	-0.0082***	-0.0083***	-0.0129*	-0.0149**	-0.0127*
		(0.003)	(0.003)	(0.003)	(0.007)	(0.006)	(0.007)
	Leverage	-0.0081**	-0.0089**	-0.0087**	-0.0278***	-0.0129*	-0.0177**
		(0.004)	(0.004)	(0.004)	(0.009)	(0.007)	(0.008)
	Loan Provision	0.0092	0.0298	0.0317	0.0899	0.0063	0.1843
		(0.027)	(0.028)	(0.028)	(0.178)	(0.055)	(0.165)
	Capital-Asset Ratio	-0.0095	-0.0129	-0.0132	-0.0199	-0.0486***	-0.0538***
		(0.010)	(0.010)	(0.010)	(0.018)	(0.014)	(0.016)
	Cost-to-Income	-0.0004	-0.0011	-0.0011	-0.0002	-0.0021	-0.0014
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	-0.0200***	-0.0102	-0.0093	-0.0230	-0.0169	-0.0203
		(0.007)	(0.008)	(0.008)	(0.030)	(0.024)	(0.030)
	Size	0.3439***	0.3012***	0.2973***	1.3359***	0.0439	1.2775***
		(0.093)	(0.093)	(0.092)	(0.455)	(0.039)	(0.433)
Ownership related	Institutional Investment	0.0041*	0.0048**	0.0048**	0.0225***	0.0140***	0.0153***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.003)
	Individual Investment	-0.0021	-0.0019	-0.0019	-0.0200	-0.0009	-0.0177
		(0.003)	(0.004)	(0.004)	(0.013)	(0.007)	(0.013)
	HH-Index	-0.5704	-1.0376**	-1.0292**	-2.5506***	-1.7803**	-1.5626***
		(0.403)	(0.436)	(0.441)	(0.411)	(0.787)	(0.566)
	Financial Crisis Dummy	-0.0211	-0.0210	-0.0208	-0.0776*	-0.0969***	-0.0686*
		(0.029)	(0.029)	(0.029)	(0.042)	(0.034)	(0.040)
	N	3318	3318	3318	2324	2337	2324
	R2 overall	0.2324	0.2314	0.2324			
Hansen test (2nd step; p-value)					0.439	0.157	0.170
Arellano-Bond test AR(2) (p-value)					0.820	0.906	0.904

Table 27: Fixed effects and generalised method of movements (GMM) estimations - CEO power and bank risk before the Dodd-Frank Act of 2010: systemic risk indicator results

This table reports fixed effects and GMM estimation results. Columns 1,2, 4, and 5 report the estimated relations between individual CEO power variables (CEO tenure and CEO network size) and bank risk, and Column 3 and 6 report the estimated relations between two CEO power variables and dependent variable. Bank risk is measured by systemic risk. Systemic risk the marginal expected shortfall of each bank in 5% worst days of the market at given year. CEO tenure is the number of years the CEO has served in a position at given year. CEO network size is the number of network nodes that the CEO has at given year. CEO related, board related, bank specific, and ownership related control variables are calculated annually for each bank. Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The sample period before the pass of Dodd-Frank Act of 2010 is from 1998 to 2010. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Fixed effect			GMM		
	Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Lag of dependent variable				0.4146***	0.5173***	0.4576***
					(0.038)	(0.022)	(0.024)
CEO power	CEO Tenure	0.1293*		0.1330	0.2750***		0.1104**
		(0.075)		(0.098)	(0.083)		(0.051)
	CEO Network Size		0.5620***	0.5136***		0.0834**	0.2236**
			(0.169)	(0.131)		(0.034)	(0.102)
CEO related	CEO age	-0.8458	-1.8919**	-1.4866*	-0.1450	-0.0510	-0.6733**
		(1.821)	(0.878)	(0.858)	(0.100)	(0.164)	(0.276)
	CEO Gender	-1.9617**	-1.5203**	-1.1364	-0.5511	-0.8221	-0.3944
		(0.855)	(0.672)	(1.004)	(0.904)	(0.557)	(0.286)
	CEO Experience	-0.8403***	-0.1983	-0.2279**	-0.0431	-0.0464	-0.0436**
		(0.292)	(0.121)	(0.112)	(0.032)	(0.058)	(0.022)
	CEO Education	-0.0758	-0.6105	-0.6960*	-0.9120**	-0.0737	-0.0874
		(1.020)	(0.388)	(0.399)	(0.387)	(0.085)	(0.108)
Board related	Board Size	-0.0970	-0.0912	-0.1198*	-0.0038	-0.0245**	-0.0030
		(0.126)	(0.055)	(0.064)	(0.015)	(0.012)	(0.009)
	Board Independence	-6.5387***	-2.9948*	-0.9321	-0.6613	-1.0156***	-0.9360**
		(2.620)	(1.607)	(1.304)	(0.626)	(0.275)	(0.447)
Bank specific	Liquidity	-0.0481***	-0.0196	-0.0531***	-0.0070*	-0.0103***	-0.0013
		(0.017)	(0.015)	(0.018)	(0.004)	(0.003)	(0.002)
	Leverage	-0.1052***	-0.0147	-0.0129	-0.0296***	-0.0005	-0.0200**
		(0.028)	(0.017)	(0.016)	(0.010)	(0.002)	(0.009)
	Loan Provision	0.1425	0.7916***	0.5804***	0.0990	0.4406***	0.1530**
		(0.543)	(0.203)	(0.199)	(0.082)	(0.158)	(0.072)
	Capital-Asset Ratio	-0.2065**	-0.0066	-0.0217	-0.0446*	-0.0160*	-0.0398***
		(0.079)	(0.034)	(0.022)	(0.026)	(0.008)	(0.010)
	Cost-to-Income	-0.0121**	-0.0043	-0.0032	-0.0011	-0.0005	-0.0002
		(0.006)	(0.004)	(0.002)	(0.001)	(0.001)	(0.001)
	ROA	-0.0598	-0.2097***	-0.1529***	-0.0119	-0.0214*	-0.0811**
		(0.099)	(0.060)	(0.052)	(0.020)	(0.013)	(0.034)
	Size	0.2599	2.8342***	1.7565***	0.1751*	0.4324**	0.0717**
		(0.489)	(0.485)	(0.410)	(0.093)	(0.179)	(0.030)
Ownership related	Institutional Investment	0.0024	0.0250**	0.0293***	0.0055**	0.0048**	0.0057**
		(0.016)	(0.010)	(0.010)	(0.002)	(0.002)	(0.002)
	Individual Investment	-0.0257	-0.0009	-0.0374*	-0.0037	-0.0028	0.0179**
		(0.044)	(0.024)	(0.022)	(0.002)	(0.004)	(0.007)
	HH-Index	13.1494***	-1.1925	-2.1675	0.4385	0.5499	0.8403
		(4.741)	(1.777)	(1.633)	(0.385)	(0.522)	(0.658)
	Financial Crisis Dummy	3.5323***	-0.5930***	-0.7486***	-0.0672*	-0.0703***	-0.0894***
		(0.359)	(0.137)	(0.139)	(0.037)	(0.025)	(0.032)
	N	3316	3316	3316	1861	2302	2304
	R2 overall	0.1758	0.1759	0.1758			
Hansen test (2nd step; p-value)					0.436	0.145	0.175
Arellano-Bond test AR(2) (p-value)					0.895	0.619	0.198

Appendix F: Correlation Matrix for Selected Variables

Table 28: Correlation matrix of selected variables

	Z-score	Systematic risk	Systemic risk	Executive Network Size	Executive Tenure	CEO Network Size	CEO Tenure	CEO Age	CEO Gender	CEO Experience	CEO Education	Board Size	Board Independence	Liquidity	Leverage	Loan Provisions	Capital-Asset Ratio	Cost-to-Income	ROA	Size	Institutional Investment	Individual Investment	HH-Index	Financial Crisis Dummy
Z-score	1																							
Systematic risk	0.02	1																						
Systemic risk	0.02	-0.48	1																					
Executive Network Size	-0.03	0.24	-0.15	1																				
Executive Tenure	-0.06	0.10	-0.04	-0.07	1																			
CEO Network Size	-0.02	0.22	-0.13	0.54	-0.04	1																		
CEO Tenure	0.01	-0.02	0.03	-0.11	0.47	-0.13	1																	
CEO Age	0.09	0.01	0.01	-0.04	0.08	-0.19	0.24	1																
CEO Gender	0.02	0.00	-0.01	0.00	-0.03	0.03	0.00	-0.02	1															
CEO Experience	-0.04	0.17	-0.11	0.32	-0.02	0.20	-0.06	-0.07	-0.03	1														
CEO Education	-0.03	0.10	-0.07	0.28	0.01	0.33	-0.06	-0.09	0.04	0.12	1													
Board Size	0.05	0.21	-0.11	0.25	0.03	0.28	-0.04	-0.03	-0.07	0.07	0.12	1												
Board Independence	-0.01	0.03	-0.05	0.08	-0.03	0.11	-0.03	-0.03	0.08	0.09	0.06	0.04	1											
Liquidity	0.15	0.06	0.00	0.08	0.05	0.09	-0.01	-0.03	-0.01	0.02	0.03	0.07	0.01	1										
Leverage	-0.08	-0.11	0.12	-0.15	0.08	-0.08	0.03	0.01	0.00	-0.13	-0.07	0.00	0.08	-0.01	1									
Loan Provisions	-0.20	0.06	-0.11	0.06	0.03	0.04	-0.04	0.01	0.00	0.07	-0.02	-0.07	0.02	0.00	-0.02	1								
Capital-Asset Ratio	0.32	0.03	0.00	0.01	-0.22	-0.06	-0.07	0.11	-0.01	0.10	-0.09	-0.12	-0.03	-0.02	-0.30	0.10	1							
Cost-to-Income	-0.24	-0.17	0.00	-0.03	-0.11	-0.02	-0.10	-0.03	0.03	-0.02	-0.02	-0.11	0.05	0.02	0.11	0.28	-0.08	1						
ROA	0.24	0.10	0.07	0.04	0.05	0.03	0.08	0.03	-0.05	0.01	0.00	0.09	-0.04	0.06	-0.10	-0.41	0.19	-0.68	1					
Size	0.02	0.49	-0.27	0.52	0.09	0.43	-0.05	0.05	-0.04	0.30	0.23	0.43	0.04	0.13	-0.32	0.03	-0.07	-0.22	0.10	1				
Institutional Investment	0.13	0.36	-0.19	0.37	-0.12	0.27	-0.10	0.07	0.01	0.25	0.13	0.01	0.08	-0.02	-0.25	0.01	0.24	-0.10	0.08	0.51	1			
Individual Investment	-0.10	-0.20	0.11	-0.12	0.13	-0.14	0.17	-0.04	0.02	-0.08	-0.03	-0.08	-0.24	0.02	0.10	0.02	-0.04	0.04	-0.03	-0.31	-0.49	1		
HH-Index	0.09	-0.04	0.02	-0.04	-0.15	-0.07	-0.05	0.02	0.04	0.00	-0.05	-0.20	-0.14	0.01	-0.11	0.00	0.24	0.09	-0.03	-0.11	0.34	0.08	1	
Financial Crisis Dummy	-0.08	-0.07	-0.26	-0.08	0.00	-0.06	0.01	-0.05	0.01	-0.02	-0.03	-0.04	0.06	-0.15	-0.10	0.12	-0.05	0.17	-0.25	-0.08	-0.09	0.06	0.02	1

Paper 3

The Impact on US Bank Performance of Investor-Connected Executives

Abstract

This paper uses of a unique dataset to examine whether institutional investors in publicly listed US banks can influence bank ownership structure and performance through a prior connection to newly appointed senior executives of the bank. A prior connection is searched by reviewing more than 10,000 detailed biographies of senior executives employed in 820 banks and find one in 208 cases across 130 banks. The impact of the connection on three measures of bank performance is assessed: non-interest income to total assets ratio, market beta, and Tobin's Q. The results indicate a statistically significant change in the performance of banks with institutional investor-connected executives. Moreover, institutional investors increase their shareholding in banks subsequent to the appointment of a connected executive. Results from pooled cross-sectional regressions reveal that the presence of connected executives is positively and significantly associated with developments in market beta and non-interest income, and negatively and significantly associated with developments in Tobin's Q reflecting because of a rise in the book value of bank assets. The results as consistent with institutional investors with prior connections to bank executives having a significant informational advantage relative to other shareholders in the bank on its likely future performance.

1. Introduction

The last century has seen the development of a large theoretical and empirical literature on agency theory and the principal-agent problem in particular.[22] In this paper, a variant of the classic principal-agent problem is addressed within the context of information asymmetry that arises between different shareholder groups. The variant as the result of information asymmetry arises because of advantages that can accrue to a particular group of shareholders by virtue of a past relationship with the firms' executives. That is, past relationships with the firms' executives, who react as insiders, might allow some investors to influence firm policy to serve their ends. This issue in the context of past links between institutional investors in publicly listed US banks and the banks' executives are examined; namely, whether such links can be shown to have systematically influence bank ownership structure and performance.[23]

In the last three decades, agency theory is on the target of researchers to solve the principal-agent problem in many theoretical and empirical studies. In a theoretical work, Gilson and Gordon (2003) provide two dimensions of the principal-agent problem. Type I principal-agent problem relies on the conflict between shareholders and executive managers. On the other hand, Type II principal-agent problem relies on the conflict between controlling and non-controlling shareholders. In both types, the information and free-rider advantages of institutional investors make them one of the main components of the principal-agent problem.

Although the literature of agency theory focuses on these two dimensions, the conflict between "potential" shareholders who would be proactive in corporate governance of the firm according to their silent objectives and current counterparts of the firm. The purpose

[22] Berle and Means (1932) is the first example of conceptual discussion of agency theory that argues separation of ownership and control. The principal-agent problem is the conflict between principals and agents (Fama, 1980; Fama and Jensen, 1983; Jensen and Meckling, 1976).

[23] 1934 Securities & Exchange Act defines the insiders as corporate directors, officers, and investors who hold considerably higher percentage of shares. The main indicator of being insiders of the tendency of gain from trading the shares of their firms. The insider definition of this act is used to define the board members and senior executives together as "executives" in this study.

of this study is to provide the third dimension into the principal-agent problem: "the connection between 'potential' shareholders and current counterparts of the firm".

In order to provide this contribution, publicly-listed US banks are investigated. Intermediation-based theories of financial institutions name the banks as the core counterpart of the economy to flow funds from depositors to borrowers. Information gathering advantage and easy access to funds from households and businesses make banks essential in the economy.[24] On the other hand, the potential conflicts of interests and agency problems among shareholders, professional managers, and stakeholders are severe within banks, which in part explains why banks are heavily regulated (Craig Nichols et al., 2009). In general, financial firms are different from non-financial firms regarding governance. Compared to non-financial firms, the first and the most important difference of financial firms is the enormous effect of firms' failures that affect the intermediation and payment system in the economy (Flannery, 1998). Additionally, financial firms much more leveraged than non-financial firms; government guarantee that is the necessary result of "too big to fail" concept of large banks and some deposit-insurance systems for the protection of depositors make the typical leverage ratio of a large bank more than 10, which is considerably higher than non-financial firms. The mechanisms that allow the bankers to take more risks exacerbate the agency problems (Laeven and Levine, 2009). Briefly, federal and state bank regulators monitor and restrict banks to enhance the safety of the banking system for depositors. Shortly, bank regulators examine each bank roughly at least once a year in the US. On the other hand, the publicly traded stock must represent a company that exceeds an annual income or market capitalization threshold. These requirements ensure that only the highest quality companies trade on exchanges. Christensen and Demski (2003) argue the advantage of external verifiability and point out that managers' financial reporting is open to being managed by the external verifiability because it limits what information can enter the accounting system, increasing the reliability and transparency. Increased transparency, achieved through the disclosure of timely and accurate information, should enable a bank to access capital markets more efficiently (Flannery and Sorescu, 1996). Securities and

[24] In the literature, there are many researches that focus on the theoretical background of banking. Scholes et al. (1976), Leland and Pyle (1977), Fama (1980a), Diamond (1984), and Gorton and Pennancchi (1990) are the early examples of the theoretical discussion on banking.

Exchange Commission (SEC) regulates exchanges and listed firms to protect investors and efficient markets, and facilitate capital formation. In addition to the strict regulations in the banking industry, SEC regulations force the publicly-listed banks to be transparent against investors and public in the US.

The empirical results that provide evidence of information asymmetry between insiders and investors of the bank will contribute to the agency theory literature. Following Cai and Sevilir (2012), the 'institutional investor-connected executive' tool is designed to provide the relationship between the institutional investor and the target bank.[25] In order to demonstrate the connection between the executive and institutional investor, we manually review more than 10,000 detailed biographies of executives from 820 publicly-listed US banks. If the executive works for the institutional investor or the bank that is invested by the same shareholder in her preceding appointments, the executive is called as "connected executive". By using a binary variable, the connected executives are insulated from the pool of executives in the integrated sample. The sample of connected executives consists of 208 executives in 130 publicly-listed US banks.

For the first step, the data is grouped as "before appointment" and "after appointment" according to the appointment dates of the institutional investor-connected executives in univariate analysis. The reason of the construction of univariate analysis is to detect the mean differences of ownership groups and measures that are used to perceive the purpose of connected executives.

For the second step, three different performance measures are employed to detect the appointment impact of 'institutional investor-connected executives': non-interest income to total assets (NIITTA), market beta (BETA), and Tobin's Q. The advantage of non-interest income is not only the increasing percentage of total income, but also the fee-based activity to reduce bank risk (Demirguc-Kunt et al., 2013). From the point view of an institutional investor, higher non-interest income to total assets ratio is a good signal of well-performing of a bank. With this reasoning, the non-interest income to total assets ratio is employed as accounting performance measure. In general, CAPM (Capital Assets

[25] Ownership is categorized at four groups following Aggarwal et al. (2015) paper. These groups are institutional investors, individual and family investors, public investors, and other investors.

Pricing Model) helps investors to calculate the risk and expected return on their investment. Market beta, a component of CAPM, is used as risk measure in the literature. For example, Carlson et al. (2010) use the standard market beta of the CAPM in order measure the change in risk. For an institutional investor, a bank with a market beta close to 1 is a predictable investment and has less surprising regarding investment. For a market performance measure, market beta is employed in this study. Tobin's Q ratio is simply the total market value of a firm divided by total asset value. Chung and Pruitt (1994, p. 70) define Tobin's Q "…as the ratio of the market value of a firm to the replacement costs to its assets". The definition states that Tobin's Q is the combination of market value and book value; the requirement of third performance measure of the multivariate analysis is satisfied by Tobin's Q definition.

In order to analyse the effect of appointment on publicly-listed US bank performance in multivariate analysis, the pooled cross-sectional regressions with robust standard errors are employed for each performance measure. In addition to the common explanatory variables that are used in the literature, CAMELS variables that can be easily approximated are used as control variables. Such proxies are common in commercial banking literature. Of the six CAMELS variables, the measurement of "management" is the most subjective since it is usually evaluated and assigned a score by the bank examination staff. In this study, the ratio of salaries and benefits to average assets is used as a proxy for management since salaries and benefits are the largest non-interest expense element of bank overhead and are also controllable by management (Gambetta et al., 2015). In order to capture the effect of appointment on bank performance over time, the performance measures are carried forward for one, two, three, and four quarters respectively.

The findings of the univariate analysis of institutional ownership point out that institutional investment at banks significantly increases after the appointment of connected executives. The findings of the univariate analysis of ownership concentration provide similar results; the ownership concentration increases after the appointment of connected executives. The interpretation of these findings could be that institutional investor-connected executives change the ownership structure and ownership concentration after the appointment. The findings of the multivariate analyses show that

the appointment of the connected executive has a positive and significant impact on NIITTA. The connection also points out the industry experience of executives and helps banks to diversify their income from non-traditional business activities. Despite the fact that market beta (BETA) is mostly employed as a risk measure to detect the stock return volatility, it is employed as a performance measure in this paper. The findings of the multivariate analyses show that the appointment of connected executive significantly increases the market beta. The last performance measure, Tobin's Q, is employed to the effect of appointment of the connected executive on bank value. Undervalued bank stock provides an investment advantage for the affiliated institutional investor that has an information advantage. The findings reveal that the appointment of connected executive significantly decreases the value of the banks that appoint connected executive(s). In most cases, results also show that the appointment of the connected executive affects the performance for at least one-year period. The robustness checks validate the results of the multivariate analyses. Overall, the empirical evidence suggests that the appointment of the institutional investor-connected executive reshapes the ownership structure & concentration and affects performance.

The paper is organised as follows. Section 2 sets out the existing literature on corporate governance, board of directors, ownership structure, information asymmetry, and networks & connections. Section 3 describes the main data sources, dataset construction, and empirical methodology. The estimation & descriptive results and robustness tests are presented and discussed in Sections 4 and 5. Finally, Section 6 summarises the main findings and concludes the paper.

2. Literature Review

2.1. Functions of board of directors

As an early example, Berle and Means (1932) discuss the separation of ownership and control as an essential point of the managerial issues in its era. With the definition of the principal-agent problem, the suggestions on explaining and solving the problem become one of the most popular topics of researchers. With the term "principal-agent problem", the counterparts of this issue become visible, and the recommendations to solve the

problem create corporate governance literature.[26] The main purpose of corporate governance is to reduce the costs of the principal-agent problem within the firm. When the agents take self-interested actions against principals to make themselves better off, agency cost occurs, and corporate performance dramatically declines. The studies following Morck et al. (1988) show the strong relationship between large shareholding and corporate performance in different countries at different time periods. The most applied solution of this issue is to hire individuals whose duty is to monitor for overseeing various activities to reduce agency costs.

With more specific explanation, the shareholders are represented by the board of directors in the firm in which the board of directors is paid by the firm. On the other hand, the board has no managerial responsibility; they are not directly responsible for the gains and losses of the firm and are not engaged to control and allocate firm assets. Rountable (1990, p. 246) define five main functions of the board of directors in the firm. These functions are:

1. Select, regularly evaluate, and, if necessary, replace the chief executive officer. Determine management compensation. Review succession planning.
2. Review and, where appropriate, approve the financial objectives, major strategies, and plans of the corporation.
3. Provide advice and counsel to top management.
4. Select and recommend to shareholders for election an appropriate slate of candidates for the board of directors; evaluate board processes and performance.
5. Review the adequacy of systems to comply with all applicable laws/regulations.

It is clear that the functions of the board that are defined by Rountable (1990) are mainly monitoring the management due to the succession of the firm and advising the managers to let them to comply with corporate strategy, which is the user guide of the firm for executive officers, who especially for chief executive officer, are firstly responsible. The strategy construction starts with the determination of the firm's goals. The suggestions of Rountable (1990) are in line with the literature that takes monitoring and advising functions of the board as core topics. Fama and Jensen (1983) define the board of directors

[26] Theoretical framework of this paper is discussed in Appendix A.

as “composed of experts”. According to Linck et al. (2008, p. 311), “a firm’s optimal board structure is a function of the costs and benefits of monitoring and advising given the firm’s characteristics, including its other governance mechanism”. Additionally, they point out that the monitoring function of the board of directors examines the executive officers to protect them against the harmful behaviour.

On the other hand, the advising function of the board of directors is to help executive officers to make a better decision on corporate strategy and general policy of the firm (Song and Thakor, 2006). Moreover, advising triggers the level of expertise by complementing to that of CEO and increases firm value (Ahn and Shrestha, 2013). Adams and Ferreira (2007) analyse the roles of boards by presenting a model that consists of a sole board and a CEO. Their model depends on the moral hazard problem that is the result of CEO’s different decisions on projects from those of shareholders. The successful monitoring of the board prevents CEO to implement the projects that do not provide the outcome on behalf of shareholders. If the monitoring of the board fails to change CEO preferences, the board will advise CEO, and the quality of the advising will be improved by the information that comes from CEO.

2.2. Ownership Structure

John and Senbet (1998) point out that the main function of the corporate governance is to deal with the mechanism between stakeholders and management of the firms. It is known that they use a broad definition of the principal, which is one of the counterparts of the agency problem; shareholders and creditors, who supply the capital need of the firm, employees, consumers and the government are the components of this broad definition of stakeholders. On the other hand, in the US context, the corporate governance is mainly focused on the agency problem between the outside shareholders and executive managers. Most of the publicly listed firms’ ownership structures consist of many small shareholders in the US market. In this form, executive managers are much more effective on allocating funds in which they gather the benefit by controlling the firm. In addition to the executive managers’ power that comes from their professional experiences, they may hold shares of the firms as part of their compensation plans. This particular case is called inside ownership, which is the term that refers to the executive manager ownership in the firm.

With the sample of 200 largest top-tier bank holding companies from 1986 to 1996, Adams and Mehran (2003) show that the CEO ownership is smaller in banks compared to non-financial firms and the finding is in line with Booth et al.'s (2002) study. Further, Johnson et al. (2000) discuss the controlling shareholders that have the capacity to collect private benefits of control by diverting assets. On this issue, controlling shareholders do not collect the benefit from not only executive managers but also minority shareholders (Jensen and Meckling, 1976; Shleifer and Vishny, 1997).

The ownership structure gives an idea about the corporate governance and the corporate design of the firms in the market. The diversified expectations and needs of different interest groups lead investors to vary their investment actions. It could be concluded that ownership structure and agency problem provides dynamic and close relation. The investment strategies of funds may be given as proper examples of changing ownership structure and agency problem relation. This dynamic relationship is exemplified in Becht et al.'s (2010) paper by studying one of the leading UK pension funds, Hermes.[27] They point out that the outperforming returns of the fund is largely associated with the engagements of the fund with the target firms. In particular, ownership structure, with its potential benefits has been identified as an incentive device for reducing the agency costs to create superior performance and higher firm value (e.g., Bhagat and Bolton, 2013; Chung and Zhang, 2011; Dimson et al., 2015; Knyazeva et al., 2013; Shleifer and Vishny, 1997, 1986a).

In general, the literature provides two well-accepted ownership structures: "widely-dispersed ownership" and "large shareholding". Caprio et al. (2007) investigate the ownership structure of the banks in a cross-country sample that consists of 244 banks from 44 countries in 2001. Investors of the 25 percent of the banks in the sample are classified as small shareholders that are the components of the widely-dispersed ownership structure. The dominant ownership structure of the rest of the banks in the sample is the concentrated ownership. Also, government ownership is detected in 29 countries. On the other hand, despite that widely-dispersed ownership is thought to be the

[27] See also Guercio and Hawkins (1999), Gillan and Starks (2000), and Hartzell and Starks (2003) for shareholder activism.

most common dominant structure, a large number of listed banks have one or more large shareholders, a large number of listed firms have one or more large shareholders (La Porta et al., 1999a). These shareholders can be categorised as families, states, and institutions (Isakov and Weisskopf, 2009). Contrary to ownership structure in the US banks, European banks are controlled by blockholders (families and states), and they have close ties with executive management and have representatives on boards (Becht et al., 2011; Becht and Röell, 1999; Caprio et al., 2007).

As a special form of the large shareholding, family ownership constitutes an important part of the corporate governance literature. In a pioneering study, La Porta et al. (1999b) point out that family firm appears to be the common form of ownership. In their international study, families control 30 percent of firms while 36 percent of these firms are widely held. Families or individuals own approximately 65 percent of firms in Asia. Family control is also a predominant ownership form in Western Europe (except for Ireland and the UK) (Claessens et al., 2000; Faccio and Lang, 2002). Kirchmaier and Grant (2005) suggest that risk averse and capital constrained families might have different strategic goals from the maximisation of the shareholder value, although the opposite would be beneficial for minority shareholders. Even in the United States where it is accepted that S&P500 listed firms have dispersed ownership, 35 percent of firms are controlled by families (Anderson and Reeb, 2003); they show that family firms in S&P500 outperform compared to non-family firms. The findings of this study contradict the findings of Villalonga and Amit's (2006) work on family firms in Fortune 500 sample that does not assess a clear difference between firm performance and family ownership. In the European context, Barontini and Caprio (2006) and Maury (2006) show that family-controlled firms have higher market value and profitability under certain conditions. On the other hand, there is a strong correlation between large ownership, low dividend payouts and firm underperformance (with the data of 1990) and families (large shareholders) that may destroy firm value (Thomsen et al., 2006).

Government ownership that refers to the holding the shares of the firms by governments and state agencies follows a cyclical pattern over time. In the first half of the 1990s, the government ownership was a dominant ownership type worldwide; 41.6 percent of shares of banks were held by governments (La Porta et al., 2002). In developed countries, the

recent financial crisis forced the governments to nationalise failing private banks; Citigroup in the US and ABN Amro in the Netherlands are the well-known examples of failing banks that are fully or partly nationalised by the US and Dutch governments. The average share of government ownership of banks in developed countries was 7.3 percent in 2007. In a three-year period, it increased to 10.8 percent in 2009 and declined to 9.9 percent in 2010 after the financial crisis (Bertay et al., 2015). Broadly, the government ownership that is linked to underdeveloped financial systems is discussed in the literature (Sapienza, 2004).

In the last three decades, the nature of the corporate governance has been reshaped by the regulations, changed investment behaviours, recent technological developments, and other corporate-related reasons. In the same period, corporate governance has also tried to find out proper solutions to the principal-agent problem. As essential parts of the corporate governance, institutional investing and institutional investors have become essential research topics in the literature.

Institutional investors have become major actors in the corporate finance (Gillan and Starks, 2007). In the last four decades, the proportion of equity held by institutions has risen sharply in the US and the UK. At the same time, the proportion of equity held by individuals has fallen from 90 percent to around 50 percent in the US. One of the first reasons for this dramatic change in the ownership structure is the boom in the total assets of the mutual funds (Maher and Andersson, 2000). Institutional investors that are larger than individual investors are subject to Securities and Exchange Act (1934) Section 13(f) reporting requirements in the United States. Institutional investors have legal identities, and more responsibilities than individual investors have. In the last three decades, the nature of the business has been moved from a place that the competition is harmful to a new one that gives change to survive to different sized and organised companies. Pound (1991) and Black (1992) show that institutional investors activism has evolved from hostile take-overs to relationship investments; hostile take-over of the institutional investors seems profitable in the short run, and then the devastating effects are the next returns in the long term. Relationship investment has an increasing importance in the market. The connection among business counterparts are thought as the connection

among different parts of the same body. Hong et al. (2005) point out that stock market participation is affected by social interactions.

Financial markets in the US is dominated by institutional investors (Warfield et al., 1995). Additionally, the growth of the institutional investment in listed US companies shows an upward trend during the last six decades. In the 1950s, only 7-8 percent of the market capitalization of the US equities was managed by institutional investors. This proportion has been increased to 67 percent in 2010 (Tonello and Rabimov, 2010). Despite the decreased number of investment companies, the total net assets of investment companies, which were about $6 billion in 1998, were more than $18 billion in 2015 ("2016 Investment Company Fact Book," 2016). The institutional investment in the publicly listed US banks increased from 10 percent in 2001 to 40 percent in 2013 (Wang, 2015). Although there is an increasing trend of institutional ownership in banks, it is less than that in non-financial firms. The main reason of less institutional investment in banks is the restrictions on the capital structures of financial institutions (Barth et al., 2004).

In a recent study of 296 financial companies, the findings of Erkens et al.'s (2012) work shows that institutional investment is common in the US compared to European countries. Also, despite the reverse relationship at crises, tendency to large shareholding in the US is lower than that in Europe. In an empirical research, Barry et al. (2011) show that the average institutional ownership in 249 European commercial banks is 35.4 percent and has an increasing trend between 1999 and 2005. Although there is an increasing trend of institutional ownership in banks, it is less than that in non-financial firms. The main reason of less institutional investment in banks is the restrictions on the capital structures of financial institutions (Barth et al., 2004). In a cross-country study, Caprio and Levine (2002) point out that 40 percent of the countries have strict rules and regulations on bank capital structure.

Institutional investors' investment background is a way to categorise them. In these categories, short-term institutional investors may decrease the quality of earnings. On the other hand, long-term institutional investors pay much more attention to recognising the management rather than gaining from less quality of earnings (Koh, 2007). The institutional investors that have relative advantages on the financial support and

information discovery are eager to attend the corporate governance of the companies that they invest. In an empirical study on one of the leading pension fund in the UK, Becht et al. (2010) show that institutional investors create value by not only buying & selling of shares but also monitoring the firm in the long-term. On the other hand, there are concerns about their negative influence, as their herd-like and short-sighted behaviour can exacerbate the extent of earnings management and thus reduce earnings quality (Graves, 1988). In a sample of 11,043 US mergers from 1984 to 2001, Chen et al. (2007) show that institutional investors that focus on mergers and acquisitions in the long run are specialised in monitoring the management. Even short-term or long-term, institutional investments choose the larger stock with the high book-to-market ratio. Additionally, institutional investors that have short-term investments prefer stocks that have lower dividend yields in an environment where the short-term investments are more successful than the long-term investments (Yan and Zhang, 2009). On the other hand, Porter (1992) and Bushee (2001) point out that short-term investments of institutional investors might be failed because of the short-term pressure hypothesis. The short-term pressure hypothesis is the natural pressure on the institutional investment managers who have to maximise the profit from the investment in the short run.

Another classification of institution investment in the literature is designed on different investment strategies of institutions. Bushee (1998), Ke and Ramalingegowda (2005), and Ke et al. (2006) group them according to their increasing manipulations on earnings. These groups are transient institutional investors, dedicated institutional investors, and quasi-indexer institutional investors. Transient institutional investors have small stakes in many companies in their portfolios. Their main interest is buying-selling activities; therefore they pay much more attention to the current earnings of the companies. Dedicated institutional investors have long-term investments in fewer companies. Because of the long run investment, managers of the institutional investors are well-informed about the investment and monitor the transactions. Quasi-indexer institutional investors seek higher diversification and low portfolio turnover. Their passive governance strategies provide them lower information about the investment.

Despite the fact that different measures that use to define the transactions of the institutional investors, previous studies assume that the structure of the institutional

investors is homogeneous (Yan and Zhang, 2009). Investment objectives and styles, legal restrictions and competitive pressure of institutional investment differentiate institutional investors that make different investment decisions. Additionally, different information levels of institutional investors differentiate the investment decisions. Yan and Zhang (2009) point out that higher return expectation at short-term investments of the institutional investors is the sign of the "informed" institutional investor. Bushee and Goodman (2007) find that institutional investors have private information on some portfolio companies. Ali et al.(2004), Pinnuck (2005), Ke and Petroni (2004), and Ke and Ramalingegowda (2005) show that the change in the holdings of the company on behalf of the institutional investors is positively correlated to the future company earnings and returns. Additionally, Nofsinger and Sias (1999) study the effect of a change in institutional ownership on the next year's return. Cai and Zeng (2004) define the direction of the effect in forecasts. They point out that change in institutional investors has an adverse effect on the forecast of the next year's returns. The sensitivity of the forecast of the future returns depends on how to measure institutional trading (Bennett et al., 2003). Gompers and Metrick (2001) show the positive relation between institutional ownership and future stock returns. They mention that the reason of the positive relationship is the temporary demand shocks of stocks rather than informational advantages of institutional investors. On the other hand, information advantage of institutional investors has different information levels that sometimes provide benefits of forecasting the earnings of the company. In a supporting study, Badrinath and Wahal (2002) point out that there is a positive correlation between the changes in ownership and the lagged return of the company. Baik et al. (2010) point out that there is a positive relationship between the change in local institutional ownership and future returns.

2.3. Information Asymmetry as a component of corporate governance

Information asymmetry, which is one of the main assumptions of this study, is indicated by a sizable body of research. Mainly, information asymmetry regarding quality and frequency of information released is linked to boards that are assumed to perform an effective job of monitoring executive managers in the literature (Ajinkya et al., 2005; Chen et al., 2009; Hermalin and Weisbach, 2012; Song and Thakor, 2006). The definition of information asymmetry is related to the information differences and conflicting

incentives between principals and agents; in a broad definition, the information difference occurs between counterparts of the business (Akerlof, 1970; Alchian and Demsetz, 1972).

Information asymmetry is the unbalance at information levels of market participant. There should be information asymmetry in the market for the existence of earnings management. Richardson (2000) shows that information asymmetry is a necessary condition to keep earnings management functional. High information asymmetry allows profitable private information acquisition and keeps the analysts to follow the firm (Barth et al., 2001). On the other hand, there is a downside of the information asymmetry; lower cost of capital and efficient market occur in the absence of information asymmetry (Glosten and Milgrom, 1985; Lang and Lundholm, 1996; Welker, 1995). According to Armstrong et al. (2010), accounting information is more accurate than financial information. Accounting information is not only the source for gathering information about the transactions of the firm but also an important information tool for investors to reduce the information asymmetry. Hunton et al. (2006) point out that the accounting reports prepared by managers are essential for reducing the information asymmetry for investors.

By reviewing the literature, Healy and Palepu (2001) suggest that there are three well-known ways to deal with information asymmetry. The first one is the optimal contracts between principal and agent in which an optimal contract requires the agent to disclose relevant information that helps board members to monitor the transactions of executive managers on behalf of principals. In a theoretical paper, Maug (1997) tests the information asymmetry to decide the monitoring function of the board of directors. Raheja (2005) theoretically shows that board monitoring increases when the level of the private benefits of the executive managers increases; this finding point out that the need of more independent boards to enhance the effectiveness of board monitoring. Bushman et al. (2004) show the geographical diversification of the firm, which provides specific information to protect the transactions, as a measure of the monitoring function of the board of directors. Additionally, Booth and Deli (1999) use other variables to gauge the complexity of the firms to defend the idea that monitoring function is costly for geographically diversified firms. If the information asymmetry is high, because of the increased cost of the transformation of the firm-specific information to the independent

members of the board of directors, employing outsiders as the independent member of the board of directors will not be optimal for monitoring function. According to Fama and Jensen (1983), high stock volatility is the result of information asymmetry and the firms with high stock volatility have specific information that is unknown to outsiders. Adams and Ferreira (2007) show that the limited number of outside member of the board of directors is acceptable to decrease the cost of monitoring. In an empirical research, Boone et al. (2007) link the monitoring function of the board of directors and the age of the firm; the complexity of the firm increases with the firm age. If the firm is "mature", the specific information increases.

The second one is the regulations of legal authorities. For instance, the SEC (Securities and Exchange Commission) requires firms to report audited financial information to provide investors with registration statements and periodic reports. In the banking context, Board of Governors of the Federal Reserve System (FED), Federal Deposit Insurance Corporation (FDIC), Office of the Comptroller of the Currency (OCC), and National Credit Union Administration (NCUA) are the regulators that require firms to disclose financial information of the banks.

There are some different channels for companies to provide disclosure. Companies can provide new and relevant financial information as disclosure through regulated financial reports (Kothari, 2001). The aim of acts and regulations is to create a fair market condition for all investors. The fair market conditions can be established by reducing the information asymmetry on behalf of insiders. The findings of Bettis et al.'s (2000) work is in line with this assumption and points out that the reduced information asymmetry limits the insider profit. These financial reports consist of income statements that show revenues and expenses of the companies during the given period, footnotes that are the detailed financial reports in income statements to specify and detail the transactions, management discussion and analysis. Additionally, management forecasts, analysts' presentations, press releases, corporate reports are voluntary disclosure tools of firms. Information disclosure is the treatment of information asymmetry between principal and agent. Investors tend to track firms by using voluntary disclosures as credible information. In theory, the credibility of disclosure increases with specified firm-related auditing activities by accredited and liberated third-party companies. On the other hand, Watts and

Zimmerman (1981) and Warner et al. (1988) point out that an auditor is hired by the executive managers of the company; auditing activities might be affected by the expectations of executive managers rather than of shareholders. Even though the unlimited disclosure seems the best way to handle the information asymmetry, regulators choose to limit the disclosure. If the disclosure is unlimited, the gap between the informed and uninformed investors will be more severe than the potential information asymmetry with no disclosure. By limiting the disclosure, regulators aim to redistribute the wealth rather than creating an efficient market for investors.

Voluntary disclosure directly affects the investor type and governance mechanisms of the firms. In emerging markets, family firms (the founder of the firm and the current executives are from the same family, and the family is blockholder) tend to collect the managerial rights into the control of the family. Despite the fact that the principal-agent problem does not occur between the shareholders (family-based blockholders) and executive management, information asymmetry arises between the outside investors and inside investors. Corporate shareholding is widely dispersed in the US (Prowse, 1990, 1992). Ali et al. (2007) show that family firms with high agency problem (between the inside and outside investors) make a less voluntary disclosure about the corporate governance transactions to detect the voluntary disclosure of family firms in the US market. Chen et al. (2008a) point out that the ownership concentration (institutional investors, blockholders, and families) is positively correlated to the information asymmetry. The stocks that have greater deviation between the ownership and the control of the firm show more information asymmetry in their transactions (Attig et al., 2006). Rubin (2007) points out that there is a positive correlation between the institutional holding and the liquidity of the stock. Healy and Palepu (1995) focus on voluntary disclosure according to the information role of financial reporting for capital markets. Compared to the investors, the executive managers have relatively much more information of the expected future performance. Voluntary disclosure works properly to create an available business environment for investors if the accounting decisions of the executive managers reach to the outside of the firm. Additionally, Healy and Palepu (1995) point out that the positive perception of the investors helps managers to manage the public debt, equity and stock share transactions.

The third solution is the presence of information intermediaries. Financial analysts play a major role in the market by distributing the financial information among investors. Givoly and Lakonishok (1979) and Lys and Sohn (1990) point out that markets trust the publications of individual analysts. With the sample of firms that are listed on NYSE, AMEX, and NASDAQ from 1981 to 1996, the findings of Barth and Hutton's work (2004) documents that the information that signals good corporate governance of firm with higher analyst coverage diffuses faster in the market. Additionally, Hong et al. (2000) point out that analysts play a positive effect on the diffusion of the information in financial markets. Cross-listed foreign firms can reach new investors; especially, the higher prestige of being traded in more efficient markets attracts new investors. Passing international barriers to be cross-listed in a particular country is also another factor which increases firm prestige (Karolyi, 2006). Reese Jr. and Weisbach (2002) show that cross-listing provides greater liquidity and more equity capital for companies, where Miller (1999) and Hail and Leuz (2009) show that cost of capital is lower for cross-listed companies. Another benefit is increasing forecast accuracy of the companies. The analysts will more deeply study cross-listed companies, and this will eventually increase the forecast accuracy. Empirical studies have shown that the companies' values increase by increasing analyst coverage (Baker et al., 2002; Lang et al., 2003). In the foreign cross-listed companies with high analyst coverage price informativeness increases (Bailey et al., 2006; Fernandes and Ferreira, 2008).

2.4. Networks and connections in corporate governance

Network refers to a set of nodes and set of links that represent relationships between nodes (Jackson, 2010). In this definition, the nodes refer to actors of the network (individuals, business units, or organisations). The relationships that specified in the definition are established by the nodes due to communicate or collaborate and flow the information through nodes (Brass et al., 2004). It is evident that networks are capable of changing the structure of information flow, to decide the direction of the flow, and to reorganise the resources. By using the similarity, imitation, and generation of innovations, networks transfer information through the components of the chain (Hong et al., 2005). On the other hand, networks mediate transactions among organisations and human co-operations. In addition to the mediation role, networks provide different access points to

the same resources at inter-organisational (Madhavan et al., 1998) and intra-organisational (Shah, 2000) levels. Moreover, the characteristics of network actors also affect the information (Chung et al., 2000; Klein et al., 2004; Mehra et al., 2001). Social networks are network structures with the nodes (individuals or institutions) and point out the connections with various social relationships.

The construction of social networks is an ex-ante event and is independent of the information flow. In theoretical setup, Ellison and Fundenberg (1993, 1995) discuss the local and global effects of social networks and word-of-mouth communication on decision making of agents. From an economist's point of view, network studies have two perspectives that provide feedback for each other. On one side, economic activities are useful tools to explain the formation of network structures. On the other hand, network structure has an effect on economic activities. In connection with this argument, theoretical and empirical studies show that social interactions and ties have an impact on economic behaviour in sociology literature. As Coleman (1988, p. 96) puts it:

> "The economic stream, on the other hand, flies in the face of empirical reality: persons' actions are shaped, redirected, constrained by the social context; norms, interpersonal trust, social networks, and social organization are important in the functioning not only of the society but also of the economy."

The literature consists of studies that argue the benefits of network and connection. According to Courtney and Jubb (2001), connections increase the efficiency of advising function of the board of directors because of the relationship between individuals and external environment. Social network that depends on educational and professional connections is the fitting example of the relationships. At organizational level, connections provide reliable and inexpensive information channels among individuals (Haunschild, 1993), enables the exchange of expertise among firms (Burt, 1992; Uzzi, 1996), and affects firm performance (Gulati et al., 2000); diversified and pooled resources and knowledge are diffused among organizations by using the connections. At the individual level, by investigating incorporate connections, strategic alliances, and industrial districts (Inkpen and Tsang, 2005), connections provide unique information and help them to diverse the perspectives (Cross and Cummings, 2004).

There is an expanding literature that connects networks and corporate financial policy with the context of direct board connections (Hallock, 1997), indirect board connections (Faccio et al., 2006; Fisman et al., 2006), and "backdoor" connections (Conyon and Muldoon, 2006; Larcker et al., 2005). The link between director networks and CEO pay is one of the research topics related to corporate financial policy. By reviewing positions of directors, Hallock (1997) points out that 8 percent of the CEOs are mutually connected with another CEO. Additionally, at least 20 percent of the firms have one or more employees (current or retired), who seat on the board of another firm in the US sample. The findings show that compensations of connected CEOs are significantly higher than others and these CEOs tend to be appointed at larger firms because of their connections. The findings also provide information about the downward trend of the return of connections that is measured by the change in CEO compensation; the return of connections in the 1970s is higher than that in 1990s. In another study, Fich and White (2003) explore the mutual board memberships of directors at different firms and its effect on CEO compensation and CEO turnover. By using the sample of 366 large US firms (87 percent of these firms appoint one or more mutually connected board members), they show that CEO compensation is higher and CEO turnover is lower when the boards include mutually connected director(s). There are two possible reasons discussed; the CEO entrenchment is established by using the mutually connected director(s) and the strategic alliances between first become stronger by the presence of mutually connected director(s). Moreover, Hwang and Kim (2009) show that CEO compensation is higher in firms. When the directors are more socially connected (educational background, military service, and regional origin) to the CEOs in the sample of Fortune 100 companies from 1996 to 2005. In a recent study with the sample of S&P 1500 firms for the period of 2000 and 2007, Fracassi and Tate (2012) document that powerful CEOs hire directors, who are more socially connected with them. The appointment of connected executives weakens the monitoring and results value-destroying mergers. In the French sample of more than 200 firms for the period of 1994 and 2001, Nguyen (2012) points out that the impact of social ties of the executives and board members and argues that the CEOs, who are socially connected to the board members, are less likely to be dismissed. Additionally, Bizjak et al. (2009) study the role of board links in spreading the employee stock option backdating process from one firm to another. With the dataset of 5,716 unique firms from

1996 to 2002, they show that the likelihood of using backdate stock options of firms increases by the presence of board member connection with previously identified backdating firms.

The findings of Hong et al. (2005), Cohen et al. (2008) and Kuhnen (2009) works provide a contribution to the literature on the effect of social ties in the mutual fund industry. The findings of Hong et al.'s (2005) work show that investors spread the information of the stock by word-of-mouth rather than by sharing the same geographic location. In addition to this findings, Cohen et al. (2008) investigate the performance of mutual fund managers by using the social networks. The nodes are corporate board members, who have private information, and mutual fund managers, who have high incentive to use this private information. The connection is established by using the same educational background (both undergraduate and postgraduate educations). With the sample of 1,648 US actively managed mutual funds and 2,501 portfolio managers from 1990 to 2006, they test the hypothesis that mutual fund managers are more likely to place larger bets in firms with the board members who are connected to the mutual funds managers and earn higher returns on these investments. The findings show that the portfolios that are established by using the connected stocks outperform the portfolios of non-connected stocks by 7.8 percent per year. As expected, the returns are concentrated around the announcements of corporate news. The potential interpretation of these results is related to the effect of social networks on asset prices by using the private information. Kuhnen (2009) investigates the link between the past business connections of mutual fund managers and advisory firms. By using the mutual fund filings for the period of 1993 and 2002, she finds no evidence of positive effect of social ties between the fund managers and advisory firms on mutual fund portfolios. By using the similar source of social ties, Massa and Simonov (2005) discuss the relationship between portfolio choices of individual investors and their educational backgrounds. For the lending market, Garmaise and Moskowitz (2003) extend the literature of network by using a similar methodology of Kuhnen's (2009) work. They use the informal financial networks to test the role of commercial lending brokers in the US market. The findings show that lending managers use their networks to allow their clients to access finance.

In a recent study, Fracassi (2016) points out that managers are affected by their social peers when they make a corporate policy decision by detecting social, educational, and professional ties to 30,860 key executives and directors of 2,059 companies of S&P 1500 from 1999 to 2009. In addition to the external connections, the literature provides studies that take the internal connection into consideration. The findings of Fracassi's (2016) work is in line with Shue's (2013) work that points out the similar corporate decisions from the executives, who are graduated from Harvard Business School and are assigned to the same classes, in the sample of S&P 1500 firms from 1992 to 2009. Schmidt (2015) explore the effect of social ties between CEO and board members internally. Some scholars argue that any ties between board members and executive managers (especially CEO) decrease the monitoring power of boards. On the other hand, in a reverse mechanism, the capability of advising of boards increases by the presence of ties. By using a completed sample of mergers from 2000 to 2011, the findings of this study show that social ties are positively related to the higher bidder announcement returns. On the other hand, the reverse results may be consistent with the need of more monitoring activities of boards on behalf of shareholders. The weakened monitoring power of board is also discussed in El-Khatib et al.'s (2015) work in the context of merger performance. They mention that pre-existing personal ties affect corporate governance and monitoring by weakening personal judgments. In a similar vein, Pérez-González (2006) provides the evidence of adverse effect of nepotism on firm performance that is measured by profitability or market-to-book ratio. By using the sample of 335 non-financial firms in 1994, the pre-existing ties are constructed by the appointed of a CEO, who is relative or married to the former CEO, to founder, or to large shareholder in the firm.

Studies on strategic alliances and networks are another part of the literature of corporate financial policy. Robinson and Stuart (2007) focus on the strategic alliances in high-tech intensive firms, which seriously suffer from conflicts of interests compared to other firms from other industries. The dataset that they use consists of 3,854 strategic alliances from 1976 to 1998. By tracking the network for the given period, they show that biotechnology firms use the networks that are established by using the strategic alliances are employed as a corporate governance mechanism in interfirm transactions. In another study, Lindsey (2008) explores the role of venture capitalists on constructions of strategic alliances by

using the data that covers 54,722 financing rounds for more than 23,000 firms by over 1,500 venture capitalists from 1970 to 2001. The findings show that strategic alliances are common in the firms that share the same venture capitalist. In this context, venture capitals have a function of financial intermediation between first by reducing asymmetric information between investors and start-up businesses and constructing networks. In addition to Lindsey's (2008) work, Sorenson and Stuart (2001) and Hochberg et al. (2007) provide a significant contribution to the literature on the effect of networks in the venture capital industry. By using a sample of 1,025 venture capitals and 7,590 target firms from 1986 to 1998, Sorenson and Stuart (2001) explore the effect of interfirm networks on spatial patterns of exchanges in the US venture capital industry. The findings show that the information is diffused better through the networks that are constructed in venture capital communities rather than geographic and industry spaces. In addition to the work of networking in venture capital community, Hochberg et al. (2007) investigate the performance of venture capitals by using the criteria of better network construction. With the sample of 1,974 venture capitals and 16,315 target firms between 1980 and 1999, they document that well-networked venture capitals provide better fund performance. The reasons of better fund performance are the both sector-specific and location-specific investment expertise of the venture capitals and diffusion of information that allows well-networked venture capitals to diversify investments.

In a related work of the construction of connected executive sample, Cai and Sevilir (2012) investigate the board connection influence on M&A activities. In order to get 5,055 deals for the listed acquirer and target companies, they collected all mergers and acquisition announcements for the period of 1996 and 2008. They designed this study by grouping the connections into two groups. The first-degree connection denotes only one director that links two firms directly. In other words, the director seats on boards of two firms. The second-degree connection is for two directors, who are the board members of the acquirer and target firms separately, a seat on the board of a third firm; the source of the second-degree connection is the board seats of a third firm. It is clear that first-degree connections establish more direct connections. As a result, it is expected that the flow of information at the first-degree connection is more than that at the second-degree connection. Regarding M&A deals, the possible drawback of this expectation is different

objectives of the target and acquirer. On the other hand, the second-degree connections may have a higher potential for construction of more profitable deals by combining the information and experiences of two directors that are connected because of a board of a third firm. In the research design, they used first and second-degree connections to denote the connections mutually. The findings suggest that acquirer firm takes higher announcement returns with first and second-degree connections compared to not-connected sample. Overall, the connection that comes from sharing the common board membership plays a major role in corporate designs and affects investment decisions. On the other hand, by using a similar connection variable setup, Ishii and Xuan (2014) show that social connections between board members and senior managers on acquirer and target firms have a negative effect on M&A performance in the sample of M&A announcements between 1999 and 2007.

3. Methodology and Data

3.1. Data selection process

A pool cross-sectional dataset that is constructed by applying selection criteria to the raw data is compiled by using three data sources; namely, Bankscope, Thomson One Analytics' Worldscope, SNL Financial, and Bloomberg's databases. Bankscope provides detailed information on corporate governance such as age, appointment date, and appointment history of executive managers and board members. SNL Financial, which collects and standardises all relevant financial data for the banking industry by using required company fillings, supplies financial statements and fundamental ratio information of banks. Worldscope delivers information on the ownership structure of banks, while Bloomberg provides market information of listed banks such as stock price and number of shares outstanding.

Firstly, the list of active and listed banks as of 31st of December 2013 at exchange markets (New York Stock Exchange, NASDAQ and other exchanges) in the United States is

established.[28] 820 publicly-listed US banks are sourced from SNL Financial database.[29] The sample combines three different sub-samples that consist of quarterly data between 2000 and 2013 to meet the requirements of the research.

The first sub-sample is constructed to provide the information of executive managers and board members such as name, age, gender, appointment date, job title, and type of position. In this study, the detailed biography of an executive is essential to provide information about the name(s) of the organisations that executive worked for, the position(s) that executive held, and executive's previous appointment date(s). The Bankscope executive identification number that is uniquely assigned to each executive is used to construct the pool of detailed biographies.

In the literature, the role of the board is defined as solving agency problems and protecting shareholder rights. As one of the sides of the agency problem, an agent is positioned against the board of directors (Dominguez-Martinez et al., 2008; Guo and Masulis, 2015; Oshry et al., 2010). Even if the general trend in the literature is to differentiate board membership and professional management as two different groups, in order to clearly specify professionals who are responsible for the performance of banks, the sample of this study takes these two groups (executive managers and board members) as one group and defines this combined group as "executives" (Demsetz et al., 1997). The first sub-sample provides 8259 different executives at 820 publicly-listed US banks.[30]

The second sub-sample from Thomson One Analytics' Worldscope contains shareholder names, unique shareholder identification numbers and ownership percentages of shareholders of the listed US banks for the defined period. The ownership percentage of shareholding is the fraction of ownership that shareholder holds in total shares. Despite the fact that ownership percentage higher than 5 percent is defined as large shareholding for any group of investors (Chen et al., 2008b; La Porta et al., 1999a), the ownership

[28] In addition to the list of publicly-listed US banks, raw data contains delisted banks on 31st of December 2013.
[29] The list of publicly-listed US banks with total assets above $1 billion is provided in Appendix B, Table 35.
[30] The database that is used in this study also provides the current list of board members and executive managers on 31st of December 2013.

percentages of shareholding less than 5 percent are kept in the sample in order to catch the effect of change in ownership structure of any group of investors in 56 quarters. The second sub-sample consists of 7136 different shareholders with their unique identification numbers.

The ownership structure of the publicly-listed US banks is categorised by following Aggarwal et al.'s (2015) paper.[31] Financial institutional ownership consists of the shareholding of banks, financial companies, insurance companies, hedge funds, mutual & pension funds, private equity firms, and venture capitals. In addition to the financial institutional ownership, public authority, state, government and foundation & research institutes ownerships are grouped in public ownership; individual investors, employees, managers, directors' ownerships are grouped in individual ownership. Unspecified ownerships are grouped in other ownership.

The third subsample consists of bank-specific financial structure and performance indicators that are gathered from SNL Financial and Bloomberg databases for each bank between 2000 and 2013 by using the bank ISIN.

Bankscope provides the name of each bank; however, searching bank-specific financial indicators in SNL Financial and Bloomberg by company name has the complication of mismatching. Rather a safer method to use is the International Securities Identification Number (ISIN) (common for three databases) which enables an accurate merge of these three sub-samples. The merged sample consists of 820 publicly-listed US banks, 8259 executives, and 7136 shareholders. In the panel data, each observation has a unique identifier that refers bank, executive, and shareholder identification numbers.

In order to demonstrate the connection between the executive and institutional shareholder, the detailed biographies of executives are manually reviewed in the merged sample. The "connection" term is frequently discussed in the literature (Byrd and Hickman, 1992; Lee et al., 1992). In an early example, (Baysinger and Butler, 1985) define the connection of executive with economic or psychological affiliation (i.e., being

[31] In the literature, similar categorizations of ownership are used (e.g., Bushee, 2001, 1998; Bushee and Goodman, 2007; Chen et al., 2007).

a former employee of the firm). Additionally, affiliation with subsidiaries is also used as the source of connection. By using the appointment information, Cai and Sevilir (2012) designed the connection of executives. In order to connect executives of acquirer and target firms, the first-degree connection that refers to executive's affiliation to the acquirer and target companies (e.g., mutual membership of the boards of two firms) and the second-degree connection that refers to acquirer firm executive's and target firm executive's mutual affiliations on a third firm are employed. Similarly, the executive is named as "connected executive" if he works for the bank that is already invested by the institutional shareholder that is a former employee of the executive in her previous appointments.

There are three possible outcomes of the biography review process of the executives:

1) In his previous appointments, the executive has no connection with the current institutional shareholders of the bank. These executives are defined as "unconnected executives."
2) In his previous appointments, the executive directly worked for the current institutional shareholder of the bank. These executives are defined as "connected executives."
3) In his previous appointments, the executive worked for a subsidiary of the current institutional shareholder or a company that was invested by the current institutional shareholder of the bank. These executives are defined as "connected executives."

In a similar setup, Cohen et al. (2008) discuss the potential ways of information flow through connections by investigating the connection between mutual fund managers and corporate board members, who share the same educational networks. The first possible way of information flow is the direct transfer of senior firm officers to the mutual fund manager. The second possible way of information flow is the lowered cost of information gathering for mutual fund managers; the cost of information may be the comparative advantage in collecting a particular type of information. In this setting, the possible way of information flow from executives to institutional shareholders may be the direct transfer of information or relatively lowered cost of information to gather.

Two binary variables are assigned to insulate the connected executives in the list of the executive as well as the banks that employ connected executives in the list of publicly-listed US banks. The sample of connected executives and banks consist of 208 executives, 130 publicly-listed US banks, and 3115 shareholders.[32] The following section describes how the data is examined using univariate and multivariate analyses.

3.2. Methodology and variable description

In order to design the methodology of this study, the research question is recalled: "Do institutional investor-connected executives affect the listed US bank performance?" Ke and Ramalingegowda (2005, p. 26) state that institutional investors have a significant information advantage. If so, why do institutional investor-connected executives want to affect the listed US bank performance? The answer is whether institutional investors derive significant benefits from having connected executives in place at publicly-listed US banks. After answering this question, a second question arises: "Why publicly-listed US banks?" The answer is whether the listed US bank is available for investment of an institutional investor. With these answers, the main elements of the methodology are constructed: a publicly-listed US bank which is on the target of the institutional investor to complete investment. However, the bank on the target must be ready to invest and perform well.[33]

In the dataset, 52 banks appoint more than one connected executive between 2000 and 2013. In some cases, these connected executives are appointed in the same quarter. According to Wooldridge (2002), the approximately same magnitude of cross section dimension and time series dimensions is a requirement of a panel data set up. By the violation of this requirement, the dataset is constructed in pooled cross sectional set up to catch the effect of these multi-appointments of connected executives in given period.

[32] The list of connected executives, current employers, and affiliated institutional investors of the banks as of 31st of December 2013 is provided in Appendix C, Table 36.

[33] In this study, three performance measures are employed to provide certain types of performance indicators that have potential to be consistent with the preferences of board members and professional managers in the banking industry.

Three models are constructed to measure the effect of the appointment of connected executives to explain the cross-sectional variations of different bank performance measures, after controlling for executive characteristics, CAMELS rating (US-specific supervisory rating system to classify a bank's overall condition), ownership structure, and industry. In Core et al.'s (1999) work, a significant amount of variation in CEO compensation is explained by the board and ownership structure measures. Additionally, Engelberg et al. (2012) use a similar construction of models to gauge the effect of interpersonal connections between firms and bank lenders on non-financial firm performance. Following Engelberg et al. (2012), the pooled cross-sectional regressions wit clustered standard errors are employed for each model. In this study, it is assumed that connected executives have information advantage on behalf of their affiliated institutional investors; a related assumption is that the information that the connective executives hold is private. One of the features of generally private information is short-lived (Boehmer and Kelley, 2009). In order to capture the effect of information advantage of connected executives over time, the performance measures are carried forward for one quarter to four quarters respectively.

3.2.1. Model 1

The first model analyses the performance of publicly-listed US banks by using the non-interest income to total assets ratio (NIITTA) as an accounting measure. Non-interest income to total assets ratio is an earnings and profitability ratio in which total non-interest income divided by total assets.

Broadly, non-interest income is an income that is generated by non-traditional business activities (investment banking and advisory fees, venture capital, brokerage commissions, gains on non-hedging derivatives, and income from trading and securitization) (Stiroh, 2004). Even though banks are in competition with other financial institutions that are not regulated by Federal Reserves to increase non-interest income, the increasing trend of the non-interest income in total assets makes it essential as a major component of bank performance measure on its own. On the other hand, the advantage of non-interest income is not only the increasing percentage of total assets but also the fee-based activity to reduce bank risk (Brunnermeier et al., 2012). From the point view of an institutional

investor, higher non-interest income to total assets ratio is a good signal of well-performing of a bank. With this reasoning, the non-interest income to total assets ratio is employed as a performance measure. The model is estimated as follows;

$$
\begin{aligned}
NIITTA_{\,i,t} = {} & \beta_0 + \beta_1\, Executive\ Connection_{\,i,t} + \beta_2\, Executive\ Age_{\,i,t} \\
& + \beta_3\, Executive\ Tenure_{\,i,t} + \beta_4\, Executive\ Gender_{\,i,t} \\
& + \beta_5\, Capital\ Adequacy_{\,i,t} + \beta_6\, Asset\ Quality_{\,i,t} \\
& + \beta_7\, Management\ Capability_{\,i,t} + \beta_8\, Earnings_{\,i,t} + \beta_9\, Liquidity_{\,i,t} \\
& + \beta_{10}\, Sensitivity_{\,i,t} + \beta_{11}\, Bank\ Size_{\,i,t} + \beta_{12}\, HH - Index_{\,i,t} \\
& + \beta_{13}\, Institutional\ Ownership_{\,i,t} + \beta_{14}\, Individual\ Ownership_{\,i,t} \\
& + \beta_{15}\, Public\ Ownership_{\,i,t} + \beta_{16}\, Other\ Ownership_{\,i,t} \\
& + \beta_{17}\, GDP\ Change_{\,i,t} + \beta_{18}\, Interest\ Rate\ Change_{\,i,t} \\
& + \beta_{19}\, Market\ Concentration_{\,i,t}
\end{aligned}
$$

where;

- NIITTA : Non-interest income to total assets ratio
- Executive Connection: Binary variable that is derived from the appointment date of the executives. It is 1 at the appointment quarter, otherwise 0.
- Executive Age: Executive age in years (natural log)
- Executive Tenure: Executive tenure in months (natural log)
- Executive Gender: Binary variable; it is 1 if the executive is female, otherwise 0.
- Capital Adequacy: Equity capital to total assets ratio
- Asset Quality: Net loan charge-offs to total assets ratio
- Management Capability: Salaries & benefits to total assets ratio
- Earnings: Excessive loan growth in which individual bank lending growth minus the average loan growth of all banks.
- Liquidity: Liquid assets to total assets ratio
- Sensitivity: Interest rate sensitive assets minus interest rate sensitive liabilities to total assets ratio
- Bank Size: Total assets of the banks (natural log)

- HH-Index: Herfindahl-Hirschman Index in which the total of squares of the ownership percentages of each investor in a bank.
- Institutional Ownership: Total ownership percentages of financial institutions
- Individual Ownership: Total ownership percentages of individuals and families
- Public Ownership: Total ownership percentages of government agencies at federal and state level
- Other Ownership: Total ownership of the investors defined "other" by the database.
- GDP Change: Quarterly change in gross domestic product
- Interest Rate Change: Quarterly change in consumer price index
- Market Concentration: The assets of the largest three US banks to total US banking system assets ratio

3.2.2. Model 2

In the second model, market beta (BETA) is employed as a performance measure for publicly-listed US banks that indicates whether the investment is more or less volatile than the market.

In general, CAPM (Capital Assets Pricing Model) helps investors to calculate the risk and expected return on their investment. Market beta, which is the covariance of a firm's market return relative to a market index, is widely used as a risk measure in the literature. For example, Carlson et al. (2010) use market beta of the CAPM in order gauge the change in risk. Basically, higher market beta means higher volatility for investors.

There are a huge theoretical and empirical bodies of literature that argue the efficient monitoring function that is the result of institutional investment and information advantage of institutional investors (Grossman and Hart, 1980; Maug, 1998; McConnell and Servaes, 1990; Shleifer and Vishny, 1986b). While investing in a highly volatile bank might not be an investment strategy for an individual investor, a bank with higher market beta might be an investment strategy for an institutional investor. Consequently, market

beta (generally known as a market risk measure) is employed as a performance measure in this study.

Model 2 is estimated as follows;

$$
\begin{aligned}
BETA_{\,i,t} = {} & \beta_0 + \beta_1\, Executive\ Connection_{\,i,t} + \beta_2\, Executive\ Age_{\,i,t} \\
& + \beta_3\, Executive\ Tenure_{\,i,t} + \beta_4\, Executive\ Gender_{\,i,t} \\
& + \beta_5\, Capital\ Adequacy_{\,i,t} + \beta_6\, Asset\ Quality_{\,i,t} \\
& + \beta_7\, Management\ Capability_{\,i,t} + \beta_8\, Earnings_{\,i,t} + \beta_9\, Liquidity_{\,i,t} \\
& + \beta_{10}\, Sensitivity_{\,i,t} + \beta_{11}\, Bank\ Size_{\,i,t} + \beta_{12}\, HH - Index_{\,i,t} \\
& + \beta_{13}\, Institutional\ Ownership_{\,i,t} + \beta_{14}\, Individual\ Ownership_{\,i,t} \\
& + \beta_{15}\, Public\ Ownership_{\,i,t} + \beta_{16}\, Other\ Ownership_{\,i,t} \\
& + \beta_{17}\, GDP\ Change_{\,i,t} + \beta_{18}\, Interest\ Rate\ Change_{\,i,t} \\
& + \beta_{19}\, Market\ Concentration_{\,i,t}
\end{aligned}
$$

where;

- BETA: The slope coefficient of the fitted linear regression according to CAPM (Capital Assets Pricing Model).
- Dependent variables are same as described for Model 1.

3.2.3. Model 3

The third model is constructed to analyse the performance of publicly-listed US banks by using Tobin's Q. Tobin's Q ratio is simply the total market value of a firm divided by total asset value. Chung and Pruitt (1994, p. 70) define Tobin's Q "…as the ratio of the market value of a firm to the replacement costs to its assets". The definition states that Tobin's Q is the combination of market value and book value.

In the literature, Tobin's Q is one of the most relevant performance measures that is used in studies from different disciplines. For instance, Salinger and Summers (1981) investigate the effect of the tax system on investment decision by using Tobin's Q. Morck et al. (1988) employ Tobin's Q to measure the effect of managerial ownership on stock

performance. Maury (2006) examine the family ownership and Tobin's Q relation in Western European corporations. On the other hand, Demsetz and Villalonga (2001) detect no significant relationship between ownership and Tobin's Q. Veprauskaitė and Adams (2013) explore the relationship between CEO characteristics and performance of UK companies by using Tobin's Q. The examples that are mentioned above show that Tobin's Q is widely used performance measure in the literature.

Model 3 is estimated as follows;

$$
\begin{aligned}
TOBIN'S\ Q_{\ i,t} = {} & \beta_0 + \beta_1\ Executive\ Connection_{\ i,t} + \beta_2\ Executive\ Age_{\ i,t} \\
& + \beta_3\ Executive\ Tenure_{\ i,t} + \beta_4\ Executive\ Gender_{\ i,t} \\
& + \beta_5\ Capital\ Adequacy_{\ i,t} + \beta_6\ Asset\ Quality_{\ i,t} \\
& + \beta_7\ Management\ Capability_{\ i,t} + \beta_8\ Earnings_{\ i,t} + \beta_9\ Liquidity_{\ i,t} \\
& + \beta_{10}\ Sensitivity_{\ i,t} + \beta_{11}\ Bank\ Size_{\ i,t} + \beta_{12}\ HH - Index_{\ i,t} \\
& + \beta_{13}\ Institutional\ Ownership_{\ i,t} + \beta_{14}\ Individual\ Ownership_{\ i,t} \\
& + \beta_{15}\ Public\ Ownership_{\ i,t} + \beta_{16}\ Other\ Ownership_{\ i,t} \\
& + \beta_{17}\ GDP\ Change_{\ i,t} + \beta_{18}\ Interest\ Rate\ Change_{\ i,t} \\
& + \beta_{19}\ Market\ Concentration_{\ i,t}
\end{aligned}
$$

where;

- TOBIN'S Q: The ratio of the market value of the bank to the replacement cost of the bank's assets.
- Dependent variables are same as described for Model 1.

3.2.4. Variable descriptions

The motivation for the choice of each variable is as follows;

Executive Connection is a binary variable that equals to 1 at the appointment quarter of the connected executive. Courtney and Jubby (2001) and Haunschild (1993) highlight that industry connections of executives provide a reliable and inexpensive channel of information among individuals and enable the flow of expertise among firms.

Additionally, for the board of directors, industry connections increase the advising function of the boards because of the relationship between individuals and external environment. Cross and Cumming (2004) state that individuals' networks provide unique information and diverse perspectives. On the other hand, financial expertise and network ties of executives may reduce firm value, which is measured by Tobin's Q (Fracassi and Tate, 2012; Huang et al., 2009). Under these conditions, a positive relationship is expected between NIITTA and connected executive appointment due to the financial and industry expertise of connected executives. The expected relationship between BETA and Executive Connection is also positive, which indicates that the connected executive appointment makes securities of the bank less volatile. On the other hand, the predicted relationship between Tobin's Q and Executive Connection is negative.

Executive age: Weirsema and Bantel (1992) discuss the effect of individuals' ages on the decision-making process. Liang et al. (2013) find no significant relationship between profitability performance measures of Chinese banks and executive age. Grove et al. (2011) provide a non-linear relationship between executive age and financial performance of US commercial banks. These examples of the findings indicate that both relationship outcomes are possible for three performance measures.

Executive Tenure: Salancik and Pfeffer (1980) point out that there is a positive correlation between CEO tenure and profit margin for 84 US corporations. Additionally, they detect a similar relation between stock market performance and CEO tenure. Barro and Barro (1990) highlight the effect of CEO tenure on the sensitivity of CEO pay and bank performance relation. For bank performance, Mishra and Nielsen (2000) show the positive effect of the long tenure of board members on bank accounting performance. In a recent study, Barth et al. (2013) discuss increased bank efficiency with the presence of independent and high-tenured boards. The predicted signs of the variables are positive with the three performance measures.

Executive Gender: Farrell and Hersch (2005) point out that women tend to be appointed to the board of directors of well-performing firms. The literature of gender diversity of board structure and top management provides mixed results (Adams and Funk, 2011; Elsaid and Ursel, 2011; Francoeur et al., 2008; Martin et al., 2009). Haslam et al. (2010)

find out the negative relationship between the percentage of female directors on board and Tobin's Q. On the other hand, the same percentage has positive relationships with return on assets and return on equity. Liu et al.(2014)'s work release similar results; they find a positive relationship between female board membership and board performance. Either a positive or negative relationship is anticipated between Executive Gender and NIITTA and BETA, respectively; a negative relationship for Tobin's Q.

Capital Adequacy, Asset Quality, Management Capability, Earnings, Liquidity, and Sensitivity are CAMELS rating indicators. In order to construct a composite measure for bank rating, US federal bank regulation organisations create the CAMELS rating system. Accordingly, banks are assessed on individual performance measures at federal or state level; these measures are capital adequacy, asset quality, management, earnings, liquidity and market fluctuation sensitivity. Deficiencies are reported to management and the board of directors for corrective action; the rating reports are not publicly released. A rating score from 1 to 5 is assigned to each bank; rating score 1 denotes a health bank.

In a previous study, Cole and White (2012) employ CAMELS components to explain the bank failures during the recent financial crisis. Additionally, they employ the same proxies in the study of the bank failures during the 1984-1992 period. They recommend the use of CAMELS components to evaluate the safety and soundness of commercial banks. Therefore, in this study, CAMELS ratings proxies are employed to control the capital structure, bank asset quality, managerial importance, earnings quality, liquidity, and sensitivity to market conditions.

Capital Adequacy is the ratio of equity capital to total assets is employed in the models to control the capital structure of the sample banks. According to capital structures, Basel III and federal regulators classify banks as well capitalised, adequately capitalised, undercapitalized, significantly undercapitalized, and critically undercapitalized; higher equity capital to total assets ratio is the signal of well-capitalized banks. The predicted relationship between Capital Adequacy and NIITTA is positive. Either a positive or negative relationship is anticipated between Capital Adequacy and BETA and Tobin's Q, respectively.

Asset Quality is the ratio of net loan charge-offs to total loans, which indicates that what percentage of today's loans will be returned in the projected future (Liang et al., 2013). Higher net loan charge-offs to total loans ratio is bad signalling of loans. Therefore, predicted relationship between Asset Quality and NIITTA is negative; the non-interest income from non-traditional business activities that makes net loan charge-offs less essential provides an upward trend in the process. The expected relationship between Asset Quality and BETA, which is the measure of the volatility of a stock compared to the market, is positive. Additionally, a negative correlation is expected between Asset Quality variable and Tobin's Q that measures the firm value.

Management Capabilities is the ratio of salaries & benefits to total assets. The ratio of salaries and benefits to total assets is one of the components of efficiency that links the level of non-interest expenses needed to increase operating revenue (Hays et al., 2009). Higher Management Capabilities may be used as a signal of efficiency. The predicted relationship between Management Capability and NIITTA is positive. Either positive or negative relationships are expected between Management Capabilities and BETA and Tobin's Q, respectively.

Earnings denotes the excessive loan growth that is the excessive part of individual bank lending growth compared to average loan growth of all banks. In general, loan growth is revenue growth of banks in where excessive loan growth might be a signalling of business expansion of a bank. On the other hand, there might be a reverse mechanism between excessive loan growth and loan loss (Laeven and Majnoni, 2003). Thus the anticipated connection between Earnings and NIITTA is negative. On the other hand, the expected relationship between Earnings and BETA is negative. Either a positive or negative relationship is predicted between Earnings and Tobin's Q.

Liquidity is the ratio of liquid assets to total assets to measure the liquidity of a bank. Despite the higher transaction costs of liquid assets, higher liquid assets to total assets ratio is the signalling of reduced liquidity risk (Kwan, 2003). In a recent study, Demirguc-Kunt et al. (2013) find out a positive and significant relationship between liquidity and bank performance (stock performance) in the pre-crisis period in advanced countries. In

this context, expected relationships between Liquidity and performance measures are positive.

Sensitivity is the ratio of one year GAP to total assets. The ratio gauges the change in the rate sensitive assets against total assets in which depends on the interest rate on the market. The gap refers to the difference between interest rate sensitive assets and interest rate sensitive liabilities; a positive gap refers to higher interest rate sensitive assets compared to interest rate sensitive liabilities. An increasing trend in this ratio is the signalling of increased revenue of the banks. On the other hand, the same signalling may be the reason of decreasing non-interest income. Thus the expected relationship is negative between Sensitivity and NIITTA. Either positive or negative relationships are predicted between Sensitivity and BETA and Tobin's Q, respectively.

Bank Size: Berger et al. (2005), Bonin et al. (2005), and Micco et al. (2007) find a positive relationship between bank size and bank performance in transition economies. Likewise, Berger and Bouwman (2013) use the US sample and point out that larger banks perform better at financial crisis. Additionally, because of the complex organisational structure of large banks, which creates more market-based activities, Laeven et al. (2014, p. 5) argue that large banks create more systemic risk than smaller banks. Accordingly, anticipated relationships between Bank Size and performance measures are positive.

HH-Index is a common market concentration measure, which is the summation of the square roots of each ownership percentages of banks. Compared with the other concentration ratios, HH-Index (Herfindahl-Hirschman Index) takes the distribution of ownership into account (Edwards and Weichenrieder, 2004). HH-Index that is close to 0 indicates dispersed ownership structure. With dispersed ownership, individual shareholders face relatively high monitoring costs of management. Additionally, it may create a free-rider problem among shareholders (La Porta et al., 1999a). Reduced monitoring of shareholders on management negatively affect firm performance. In this study, expected relationships between HH-Index and NIITTA and Tobin's Q are positive. The private benefits of control of blockholders may increase BETA (Konijn et al., 2011). Therefore, the expected relationship between HH-Index and BETA is positive.

Institutional Ownership: Pi and Timme (1993) employ cost efficiency and return on assets and find no connection between institutional investors and these performance measures. On the other hand, Bonin et al. (2005) show the positive effect of the institutional investment on bank performance measures in transition economies. In the US sample, McConnell and Servaes (1990) and Cornett et al. (2007) define the significant and positive relationship between operating institutional investment and non-financial firm performance proxies. Therefore positive relationships are expected between Institutional Ownership and NIITTA and Tobin's Q. Sias (1996) discusses the reasons for the positive relationship between institutional ownership and volatility. According to his argument, institutional investment is the reason of volatility because of its trading activities. In the literature, a similar argument is supported by empirical findings (Baker and Haugen, 2012; Brown and Brooke, 1993; Koch et al., 2016; Lee, 1992; Schwartz, 1991; Trueman, 1988; Xu and Malkiel, 2003). Therefore, the anticipated relationship between Institutional Ownership and BETA is positive.

As a grouped form of investment, institutional investment is employed in order to control the effect of institutional investors on certain types of performance indicators. The one, two, three, and four quarter forwarded effects of the institutional investment on performance measures are predicted to be consistent. In this one-year period (four quarters). In each forwarded period, the unbiased effect of institutional investment of certain types of performance measures are predicted in estimations.

Individual Ownership includes individual and family ownership (Caprio et al., 2007). Despite the studies that shows the positive of family ownership on firm performance (Arregle et al., 2007; Miller et al., 2008; Sirmon and Hitt, 2003), Burkart et al. (2003), Claessens et al. (2002), Heugens et al. (2009), and Young et al. (2008) point out that family ownership has negative effect on firm performance. Additionally, more individual investors proliferate the dispersion of ownership. Therefore the predicted relationships between Individual Ownership and NIITTA and Tobin's Q measures are negative; the anticipated relationship between Individual Ownership and BETA is positive.

Public Ownership is total ownership of government agencies at the state level that denotes small fractions in the sample. Altunbas et al. (2001) and Iannotta et al. (2007) show that

public ownership of banks is negatively associated with profitability performance. Additionally, Bonin et al.'s (2005), Fries and Taci's (2005) works are examples of the negative effect of public ownership on bank performance in cross-country samples. The expected relationships Public Ownership and NIITTA and Tobin's Q measures are negative; the predicted relationship between Public Ownership and BETA is positive.

Other Ownership is the total of the ownership group that is classified as other in the database. Therefore, the anticipated relationship between Other Ownership and performance measures are ambiguous.

GDP Change and *Interest Rate Change* are also employed to control for the impact of the macroeconomic environment, which affect the whole firms in the country, on the bank performance measures. *Market Concentration* is the ratio of the total assets of the largest three US banks to total US banking system assets that measures the industry conditions.

4. Descriptive Statistics

This section examines the descriptive statistics of the variables that are used in univariate and multivariate analyses.

Table 29 reports the descriptive statistics of bank performance variables (NIITTA, BETA, and Tobin's Q), executive related variables (age, tenure, and gender), CAMELS rating variables (Capita Adequacy, Asset Quality, Management Capability, Earnings, Liquidity, and Sensitivity), size, and ownership structure variables (HH-Index, Institutional Ownership, Individual Ownership, Public Ownership, and Other Ownership). Each fiscal year consists of four quarters; there are 56 quarters in the sample.[34]

The means (medians) of NIITTA, BETA, and Tobin's Q are 0.4016, 0.4513, and 1.0534 (0.3062, 0.3126, and 0.10215), respectively. The average age of executives is 56.14. The average age of executives in this sample is larger than the sample used by (Fahlenbrach et al., 2008) who report 53.97 for board members and 54.46 for professional managers in ages, respectively. The mean tenure of executives is 108.5 months (8.63 years). Barth et

[34] Correlation matrix of selected variables is provided in Appendix G, Table 45.

al. (2013) calculated the average supervisor tenure is 6.45 years. The reason of the higher executive tenure is that the sample defines board members and professional managers as executives; the average tenure of board members is greater than professional managers' tenure. In the sample, 12.98 percent of the executives are female. Farrell and Hersch (2005) stated that 12.26 percent of the boards are female in Fortune 500 companies in 1999. In Haslam's (2010) work, 10.5 percent of the boards are female in FTSE 100 companies in 2005. Therefore the gender diversity of the sample provides parallel results with previous studies. The mean (median) Capital Adequacy (the ratio of equity capital to total assets) is 0.1022 (0.9560). The average (median) Asset Quality (the ratio of net loan charge-offs to total loans) is 0.1374 (0.0656). Liang et al. (2013) reported average Asset Quality as 0.03 in Chinese banks in the similar period. The average (median) Management Capability (the ratio salaries and benefits to total assets) is 0.0044 (0.0040). The average (median) Earnings (excessive loan growth) is 0.8553 (0.4328). The mean (median) Liquidity (the ratio of liquid assets to total assets) is 0.2462 (0.2280). Demirguc-Kunt et al. (2013) found the average Liquidity as 0.7761 for five year period (2005Q1-2009Q1) from 12 countries' sample. The average (median) Sensitivity is -0.0057 (-0.0047), which indicates that interest rate sensitive liabilities is greater than interest rate sensitive assets in the sample. The mean (median) size is 13.8535 (13.4775) that is substantially greater than the sample banks' size used by (Ferreira et al., 2010). The average (median) HH-Index is 0.0348 (0.0138) in which the ownership is dispersed as expected. The means (medians) of Institutional Ownership, Individual Ownership, Public Ownership, and Other Ownership are 32.5992 percent, 14.0592 percent, 1.3872 percent, and 5.7716 percent (23.22 percent, 9.16 percent, 0.77 percent, and 7.4978 percent), respectively. The exact percentages that are gathered from the database are used in the sample. The descriptive statistics of ownership structures state that institutional investors are the dominant investment group in the sample. There is an increasing trend of institutional investment in the US. In 1950, 8 percent of US market capitalization was managed by institutional investors. In the 1990s, institutional investment was doubled from 1980 to 1996 (Gompers and Metrick, 2001). In 2010, the market capitalization of institutional investment in the US was 67 percent of all market (Blume and Keim, 2012).

Table 29: Descriptive statistics of the sample.

This table provides descriptive statistics of the variables that are employed in univariate and multivariate analyses. Unless stated otherwise, descriptive statistics are derived from the average values calculated by quarterly data. Bank performance variables, CAMELS ratios & size, ownership variables are calculated from the average values for each bank from 2000Q1 to 2013Q4. Executive related variables are calculated from the average values for each executive at banks from 2000Q1 to 2013Q4.

Variables	N	Mean	Median	Std. dev.	p25	p75	Min	Max
NIITTA	45920	0.402	0.306	0.317	0.247	0.422	0.200	4.976
Market Beta	45920	0.451	0.313	0.717	0.052	0.730	-5.03	4.958
Tobin's Q	45920	1.053	1.021	0.290	0.982	1.069	0.165	18.66
Executive Age	45920	56.14	56.33	7.211	51.43	61	25	85
Executive Tenure	45920	103.7	96.75	53.31	66.17	133.1	1	370
Executive Gender	45920	0.130	0.100	0.164	0	0.200	0	1
Capital Adequacy	45920	0.102	0.096	0.042	0.081	0.114	-0.09	0.594
Asset Quality	45920	0.137	0.066	0.182	0.023	0.171	0.001	1.000
Management Capability	45920	0.004	0.004	0.003	0.003	0.005	0.001	0.105
Earnings	45920	0.855	0.433	11.06	-4.20	4.521	-95.1	195.3
Liquidity	45920	0.246	0.228	0.128	0.160	0.310	0.001	0.957
Sensitivity	45920	-0.06	-0.047	0.160	-0.15	0.043	-0.67	0.739
Bank Size	45920	13.85	13.48	1.803	12.69	14.60	8.047	21.92
HH-Index	45920	0.035	0.014	0.092	0.004	0.028	0.001	1
Institutional Ownership	45920	32.59	23.22	29.32	7.230	54.28	0.100	100
Individual Ownership	45920	14.06	9.160	14.79	3.470	19.33	0.010	99.91
Public Ownership	45920	1.387	0.770	2.926	0.380	1.860	0.100	74
Other Ownership	45920	5.772	3.420	7.498	0.800	8.320	0.100	100

5. Results

5.1. Univariate Analyses

Table 30 presents univariate comparisons of banks that appoint connected executives (Connected Banks) and banks that do not appoint connected executives (Non-connected Banks).[35]

[35] It is considered that there might be some omitted variables that have potential to affect the results. Omitted variables affect the relationship between the dependent variable and explanatory variables. In the literature, finding instruments, or proxies are the standard approaches to solve the omitted variable bias problem (Leightner and Inoue, 2012). In these approaches, the essential part is to detect the effect of omitted variable on dependant variable and the relationship between the instruments and the omitted variables. Otherwise, including additional proxies might increase or decrease the biasness (Clarke, 2005). In this study, the variables are broadly selected in order to avoid the omitted variables biasness. In Univariate analysis, statistical significances of medians are also tested with Wilcoxon test in addition to t-test. The unreported results provide similar outcome with the t-test in the study.

Table 30: Univariate analysis of connected banks and non-connected banks samples.

This table summarises the comparison of Means and Medians of banks that appoint connected executive(s) and banks that do not appoint connected executive(s). The period is from 2000 to 2013. Statistical significance of Mean differences is tested using t-test. *, **, *** indicate statistical significance of t-test at the 10%, 5%, and 1% levels respectively.

	Connected Banks		Non-connected Banks		
Variables	Mean	Median	Mean	Median	t score
NIITTA	0.4611	0.3187	0.3922	0.3044	-10.10***
Market Beta	0.6819	0.4684	0.4037	0.2820	-28.61***
Tobin's Q	1.0774	1.0331	1.0477	1.0187	-7.43***
Executive Age	56.179	56.7143	56.134	56.250	-0.46
Executive Tenure	95.567	81.608	105.77	100.27	14.00***
Executive Gender	0.1380	0.1111	0.1276	0.0909	-4.64***
Capital Adequacy	10.114	9.5900	10.239	9.5500	1.73***
Asset Quality	0.1515	0.0745	0.1345	0.0636	-5.40***
Management Capability	0.0048	0.0040	0.0043	0.0040	-11.73***
Earnings	0.9252	0.6173	0.8419	0.3920	-0.46
Liquidity	24.498	21.891	24.652	22.999	0.86
Sensitivity	-3.5890	-3.0350	-6.2924	-5.1800	-6.65***
Bank Size	15.310	14.809	13.515	13.262	-79.73***
HH-Index	0.0331	0.0195	0.0353	0.0117	1.43
Institutional Ownership	47.394	46.675	27.589	17.230	-42.11***
Individual Ownership	10.188	5.5000	15.203	10.320	14.23***
Public Ownership	1.8071	1.2200	1.1721	0.6200	-9.55***
Other Ownership	3.9239	1.3800	6.6631	5.1800	11.00***

For the performance measures, connected banks have higher NIITTA, BETA, and Tobin's Q. For executive related variables, executives at connected banks are older than executives in non-connected banks. Compared to non-connected banks, the number of appointed women are more in connected banks. On the other hand, executives in non-connected banks are more experienced. For CAMELS variables, only Capital Adequacy in non-connected banks is greater, rest of them is greater in connected banks. For ownership structure, Individual Ownership and Other Ownership are greater in non-connected banks. All stated differences are statistically significant at 5 percent or better levels except Executive Age, Earnings, Liquidity, HH-Index, Capital Adequacy, and Management Capability.

Table 31 provides univariate comparisons of banks before and after the appointment of connected executive. After the appointment, BETA increases, when NIITTA and Tobin's Q decline. The executive sample after the appointment of connected executives provides a higher average executive age. Additionally, the number of women executive increases after the appointment. On the other hand, executive tenure declines after the appointment.

For CAMELS variables, only Earnings declines after the appointment of connected executives. Bank size and Public ownership increase after the appointment, when the ownership that is defined in Other Ownership declines.

Table 31: Univariate analysis of connected banks before and after the appointment of connected executives.

This table summarises the comparison of Means and Medians of banks before and after the appointment of connected executives. The period is from 2000 to 2013. Statistical significance of Mean differences is tested using t-test. *, **, *** indicate statistical significance of t-test at the 10%, 5%, and 1% levels respectively.

	Before Appointment		After Appointment		
	Mean	Median	Mean	Median	t score
NIITTA	0.4664	0.3186	0.4506	0.3194	0.88
Market Beta	0.5496	0.3593	0.9401	0.8070	-19.85***
Tobin's Q	1.0930	1.0485	1.0453	1.0018	6.18***
Executive Age	54.413	54.891	59.605	60.214	-29.38***
Executive Tenure	99.833	86.750	87.297	75.431	8.59***
Executive Gender	0.1365	0.0909	0.1409	0.1250	-1.02
Capital Adequacy	9.6050	9.2300	10.821	10.290	-11.34***
Asset Quality	0.1332	0.0591	0.1820	0.1078	-7.79***
Management Capability	0.0048	0.0039	0.0050	0.0040	-1.29
Earnings	1.1632	0.9026	0.5529	0.2852	1.92*
Liquidity	24.059	21.515	25.387	22.547	-3.45***
Sensitivity	-3.7452	-2.8700	-3.1282	-3.4600	-0.85
Bank Size	15.153	14.604	15.638	15.274	-8.77***
HH-Index	0.0304	0.0168	0.0367	0.0221	-3.37***
Institutional Ownership	40.789	35.480	55.670	63.695	-17.23***
Individual Ownership	11.105	6.1600	8.9281	4.8000	4.33***
Public Ownership	1.2600	0.9500	2.2067	1.5850	-7.27***
Other Ownership	4.6392	1.4700	3.3427	1.2250	3.85***

After the appointment of connected executives, the average Institutional Ownership increases from 40.79 percent to 55.67 percent. There is a similar trend in the median; median of Institutional Ownership increase from 35.48 percent to 63.69 percent. On the other hand, mean (median) of Individual Ownership declines from 11.11 percent to 8.92 percent (from 6.16 percent to 4.8 percent). The mean and median changes of Institutional Ownership and Individual Ownership are statistically significant at 1 percent. Additionally, HH-Index that increases from 0.0304 to 0.0367 and the difference is statistically significant. The change in HH-Index states that the ownership concentration increases after the appointment of connected executives. Collectively, the results tell a consistent story; the institutional investors increase the investment at banks that employ connected executives after the appointment of connected executives.

Appendix D, Table 37 presents univariate comparisons of Institutional Ownership and HH-Index of each connected banks before and after the appointment of connected executives. There are 210 appointment cases of 208 connected executives at 130 banks in the connected sample (two of the connected executives are employed in two different banks in the given period). After the appointment of the connected executives in these 210 cases, 178 of them shows an increase in average Institutional Ownership. 167 of these increases are statistically significant (121 of them are statistically significant at 1 percent). These results show that there is a significant institutional ownership increase at connected banks after the appointment of most of the connected executives. Additionally, the change in HH-Index after the appointment in connected banks is also investigated to interpret the ownership concentration change in the sample. In 210 cases that represent the appointment of connected executives, 130 of these cases shows a move from dispersed ownership structure to concentration ownership structure (increases in average HH-Index after the appointment of connected executives). 106 of these 130 cases is statistically significant (84 of them statistically significant at 1 percent). With these results, it might be concluded that the Institutional Ownership increases the percentage holding and concentration at connected banks after the appointment of connected executives.

5.2. Multivariate Analyses

The results of the multivariate analyses are provided in this section. Boehmer and Kelley (2009) argue that the private information is short-lived. The performance measures are carried forward four quarters, and the models are re-estimated with these forwarded variables due to capture the change over time. Columns 2 through 5 of each table in this section provide the estimation results for 1 through 4 quarter forwarded performance measures, respectively. Firstly, results that are shown in Column 1 are interpreted. Afterwards, the interpretations of the estimation results in Column 2 through 5 are provided. CAMELS' variables are employed with their mean differences to isolate the values above and below the average values. Institutional Ownership, Individual Ownership, Public Ownership, and Other ownership variables are employed by using dummy variables that equal to 1 if the value of observation is greater than the average value of related ownership variable for the same bank in the same period, 0 otherwise.

Seasonality effect that refers to a set of specific characteristics of quarters in time is considered in the estimations.

5.2.1. Effect of connected executive appointment on NIITTA

The univariate analysis shows that NIITTA in connected banks is significantly greater than non-connected banks in which connected banks perform better than non-connected banks in term of non-interest income from non-tradition business activities of banks. In addition to this result, the univariate analysis also points out that the performance of connected banks in terms of NIITTA declines insignificantly after the appointment of the connected executive. The first model, presented in Column 1, Table 32, analyses the effect of connected executive appointment and control variables on bank performance that is represented by NIITTA.

Executive Connection (the appointment of the connected executives) is found to have a positive effect on NIITTA in publicly-listed US banks. In the literature of auditing, Courtney and Jubb (2001) argue that the relationship between individuals and external environment increases the efficiency of the advising function of the board of directors. Additionally, Haunschild (1993) point out that exchange of expertise among firms is sourced by reliable information channels among individuals. The non-traditional banking activities (investment banking and advisory fees, venture capital, brokerage commissions, gains on non-lending derivatives, and income from trading and securitization) require banks to gain experience in the competition with other financial firms. The credible justification of this finding could be that the professional work-related connections of connected executives provide enough experience lead the bank to non-traditional businesses in which they can use the experiences they have to increase the proportion of non-interest income in total assets.

Publicly-listed US Banks that appoint older executives provide higher NIITTA in the market. In the literature, a significant amount of studies finds no linear relationship between executive age and firm performance. For instance, Larcker et al. (2007) find no linear relationship. Additionally, Core et al. (1999) find a U-shaped relationship between performance and outside director in which the presence of outside director over the age

of 69 is associated with the poor governance structure. Contrary to these examples, there is a positive and significant relationship that is detected in the sample.

Long-tenured executives in publicly-listed US banks have a positive and significant effect on NIITTA. Adams et al. (2005) show that CEOs with longer tenure are more competent than other CEOs with relatively short tenure. Additionally, Gong (2011) specifies that there is a positive relationship between CEO tenure and stock performance. This result is in line with Mishra and Nielsen (2000) and Barth et al. (2013) empirical findings that indicate the positive effect of long-tenured board members on bank efficiency and accounting performance. The experience of the executives related to the tenure in bank increases the non-interest income, which requires knowledge on specific topics.

Executive gender is employed to assess the effect of gender diversity on NIITTA. Contrary to expectations, the coefficient of this variable is positive and significant. Publicly-listed US banks with more female executive have lower NIITTA. To a certain extent the finding partially supports Ahern and Dittmar (2012) results which point out that the quota requiring 40 percent of females on the board has a negative effect on firm performance in Norwegian firms. Therefore, more female executives in publicly-listed US banks decline the ratio of non-interest income to total assets.

Capital Adequacy, which indicates the measure of a bank's ability to meet the regulatory requirements, is employed to gauge the effect of capital structure on NIITTA. As expected, the estimation results show that there is a positive and significant relationship between Capital Structure and bank performance in the measure of NIITTA. The higher equity capital to total assets ratio refers to banks, which are on the well-capitalised side of the scale, may be able to non-traditional businesses that are classified as the sources of non-interest income.

Asset Quality (the ratio of net loan charge-offs to total assets) measures the success of lending activities of banks. Higher net loan charge-offs to total assets ratio indicates higher loss on loans and therefore may signal credit risk (Dick 2006). Contrary to expectations, banks with a high level of net loan charge-offs relative to total assets provide better non-interest income to total assets ratio.

Management Capabilities is measured with the ratio of salaries & benefits total assets. As a part of efficiency, the salaries and benefits are classified as a component operating expenses, which is needed to generate operating revenue (Hays et al. 2009). As predicted, there is a significant and positive relationship between the ratio of salaries & benefits to total assets and NIITTA in which higher operating expenses increase non-interest income relative to total assets.

Earnings (excessive loan growth) indicates the better loan performance of a bank against its competitors in the market. Excessive loan growth may be generated from two sources: expansion of business of a bank and smaller loan losses (Laeven & Majnoni 2003). Regardless of the source of excessive loan growth, increased loan growth may be interpreted as a signal of good governance and may increase the non-interest income to total assets ratio of banks. As expected, excessive loan growth has a positive and significant effect on NIITTA.

The liquidation argument is assessed with the level of liquid assets in total assets. Although the expected sign of the coefficient is positive, the results detect a negative and significant relationship between the level of liquid assets in total assets and NIITTA. The result obtained from this study does not support the fact that banks with higher liquid assets generate more non-interest income.

Sensitivity (the ratio of one year GAP to total assets) is employed to evaluate a bank's sensitivity to interest rate changes in the market. As expected, the coefficient of this variable is negative and significant. Increased interest rate in the market generates an increase in interest income from interest rate sensitive assets, which is greater than the interest rate sensitive liabilities; the proportion of non-interest income may be declined compared to interest income.

Bank Size is found to have a negative and significant effect on NIITTA. The finding indicates that relatively small banks perform better regarding NIITTA. A positive but insignificant connection between HH-Index that measures the concentration of ownership and NIITTA is observed.

Institutional Ownership is found to have a positive and significant impact on NIITTA. Smith (1996) points out that institutional investors have an advantage of the information. Guercio and Hawkins (1999) argue the same information advantage of institutional investors in a sample of pension funds. Information advantage of institutional investors allows them to be active at the corporate decision (Gillan & Starks 2000). This result is in line with Cornett et al. (2007) empirical findings that there is a positive and significant relationship between institutional ownership and performance. Non-traditional business activities of banks that generate non-interest income is a policy that institutional investments apply by using their information advantage.

Individual Ownership that covers the individual and family ownership and Public Ownership are negatively related to NIITTA in publicly-listed US banks. These results are in line with the literature on the negative effect of individual ownership (Arregle et al. 2007; Miller et al. 2008) studies and negative effect of public ownership (Bonin et al. 2005; Fries & Taci 2005) on performance. More individual, family, and public investments decline the non-interest income to total assets ratio of banks. Other Ownership has a positive and significant relationship with NIITTA.

GDP Change, Interest Rate Change, and Market Concentration are also employed to control for the impact of the macroeconomic environment on the estimation of NIITTA. There are positive and significant relationships between NIITTA and GDP Change and Interest Rate Change, respectively. On the other hand, there is a negative and significant relationship between Market Concentration and NIITTA.

The estimation results in Column 2, Table 32, provide the effect of connected executive appointment and control variables on one-quarter forwarded NIITTA (the ratio of non-interest income to total assets). The coefficient of Executive Connected holds the significance at 1 percent, and the sign is positive. 13 in 18 control variables hold the signs and significance levels in one-quarter forwarded estimations. On the other hand, Earnings holds the sign of the coefficient but significant at 5 percent rather than 1 percent. Despite no significance detected in Column 1, HH-Index holds the sign of the coefficient and becomes significant at 1 percent in Column 2. The sign of Institutional Ownership becomes negative. However the significance level is changed from 1 percent to 10

percent. Individual Ownership and Market Concentration hold the significance level when the signs of the coefficients change from negative to positive.

The estimations in Column 3, Table 32 provide the estimation results of two-quarter forwarded NIITTA. Compared to Column 1, Executive Connection and 13 in 18 control variables hold the signs of the coefficients and significance levels. The coefficient of Executive Tenure changes from positive to negative, however, it becomes insignificant. Individual Ownership variables change the sign in Column 3, and it is still significant at 1 percent. GDP Change variable changes the sign and significance level in two-quarter forwarded estimation.

The three-quarter forwarded NIITTA estimation results are provided in Column 4, Table 32. The coefficient signs and significance levels of Executive Connection and 14 in 18 control variables do not change in estimations. The coefficient of Earnings becomes insignificant; the other variables change the signs when they hold the significance level at 1 percent.

The estimation results of four-quarter forwarded NIITTA are shown in Column 5, Table 32. The signs and significance levels of the coefficients of Executive Connection and 13 in 18 control variables are consistent with the results in Column 1, Table 4. The signs of Sensitivity and Individual Ownership variables are changed from negative to positive. The coefficients of other control variables that provide different signs from the coefficients from Column 1 also have different significance level in four-quarter forwarding.

The signs and significance levels of the variable that measures the effect of connected executive appointment hold in these four quarters forwarded estimation models, respectively. Most of the control variables that are employed in these estimations provide the similar coefficients regarding sign and significance level. These findings deliver the information that the short-lived private information does not tend to last one-year period.

Table 32: The effect of executive connection on bank performance: NIITTA

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as non-interest income to total assets ratio. Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. CAMELS ratios & size, ownership variables are calculated from the average values for each bank. Following Singh and Davidson III (2003), CAMELS ratios are in mean difference form. Ownership structure variables are binary variables that equals to 1 if ownership percentage of the observation is greater than the mean of ownership percentage of the specified group. Executive age, tenure, and gender are calculated from the average values for each executive at banks from. Market & industry variables are calculated from the country averages of quarterly data. Seasonality effect that refers to a set of specific characteristics of quarters in time is considered in the estimations. In Column 1, current values of NIITTA are used in estimations. In Columns 2, 3, 4, and 5, NIITTA values are carried forward one, two, three, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	0.3728***	0.2448***	0.2389***	0.0982***	0.2074***
	(0.026)	(0.019)	(0.017)	(0.010)	(0.014)
Executive Age	0.1233***	0.1659***	0.1021***	0.1386***	0.0597***
	(0.006)	(0.008)	(0.005)	(0.006)	(0.005)
Executive Tenure	0.0029***	0.0037***	-0.0011	-0.0050***	0.0021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Executive Gender	-0.0180***	-0.0330***	-0.0367***	-0.0391***	-0.0155***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Capital Adequacy	0.0057***	0.0041***	0.0037***	0.0056***	0.0046***
	(0.000)	(0.000)	(0.000)	(0.000)	(0)
Asset Quality	0.0604***	0.0089***	0.0400***	0.0286***	0.0412***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Management Capabilities	0.1396***	0.0626***	0.1104***	0.0885***	0.0927***
	(0.011)	(0.013)	(0.015)	(0.014)	(0.011)
Earnings	0.0006***	0.0005*	0.0017***	0.0003	0.0013***
	(0.000)	(0.000)	(0.000)	(0.000)	(0)
Liquidity	-0.0010***	-0.0018***	-0.0011***	-0.0020***	-0.0009***
	(0.000)	(0.000)	(0.000)	(0.000)	(0)
Sensitivity	-0.0824***	-0.1017***	-0.0190**	-0.0842***	0.0381***
	(0.010)	(0.013)	(0.009)	(0.010)	(0.007)
Bank Size	-0.0244***	-0.0270***	-0.0264***	-0.0340***	-0.0244***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
HH-Index	0.0173	0.1656***	0.1200***	-0.0386	-0.1731***
	(0.023)	(0.032)	(0.029)	(0.025)	(0.02)
Institutional Ownership	0.0204***	-0.0036*	0.0157***	0.0151***	0.0207***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Individual Ownership	-0.0073***	0.0159***	0.0077***	0.0087***	0.0178***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Public Ownership	-0.0073***	-0.0272***	-0.0070***	-0.0303***	-0.0174***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Other Ownership	0.0421***	0.0226***	0.0318***	0.0154***	0.0304***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
GDP Change	0.0114***	0.0136***	-0.0018*	0.0060***	-0.0051***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Interest Rate Change	0.0706***	0.0771***	0.0284***	0.0268***	-0.0067
	(0.006)	(0.008)	(0.005)	(0.009)	(0.007)
Market Concentration	-0.0150***	0.0023***	-0.0286***	-0.0248***	-0.0192***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Intercept	-0.0125***	-0.0243***	0.4124***	0.4083***	0.4996***
	(0.003)	(0.003)	(0.022)	(0.024)	(0.019)
No. of observations	57566	53427	51780	49896	48682
R2	0.1041	0.0980	0.0919	0.0899	0.0999

5.2.2. Effect of connected executive appointment on BETA

The univariate analyses show that the average BETA in connected banks is significantly greater than the average BETA in non-connected banks. Moreover, the average BETA after the appointment of connected executives is significantly greater than the average BETA before the appointment of connected executives in connected bank sample. The second model that analyses the effect of connected executive appointment and control variables on BETA is presented in Column 1, Table 33.

Executive Connection is found to have a positive effect on BETA. Specifically, the appointment of institutional investor-connected executive increases BETA in which the stock returns of connected banks become more volatile. This result is in line with Sias (1996), Xu and Malkiel (2003), Koch et al. (2016) findings that institutional investment is the reason of volatility. In the construction of this variable, it is mentioned that the source of the connection is a professional affiliation of the executive with institutional investors. The possible reason could be that the investment priority of the affiliated institutional investors is to take advantage of the investment in the short period.

Executive Age, which is positive and statistically significant at 1 percent, is employed to evaluate the effect of executive age on BETA. Chevalier and Ellison (1999) find out that there is a negative relationship between fund manager age and BETA, but the relation is not significant. On the other hand, Golec (1996) finds that younger and long-tenured fund managers choose risk-adjusted investments. In a similar vein, the coefficient points out that systematic risk of the bank increases with the presence of older executives in this study.

Executive Tenure is negatively related to BETA in which the systematic risk of the bank declines with the tenured executives. Results are supported by the literature (Gottesman & Morey 2006; Karagiannidis 2012; Pan et al. 2015) where the findings provide evidence of a significant negative relationship between tenure and BETA.

The coefficient of the variable for measuring gender diversity (Executive Gender) is found to be positive and statistically significant. This finding highlights the fact that the

banks that increase the number of female executives face with higher BETA. Martin et al. (2009) point out that firms with high systematic risk tend to appoint female directors to reduce risk. Additionally, Elsaid and Ursel (2011) show that a CEO change from a male to female reduces the systematic risk. Contrary to this example, finding supports Francoeur et al. (2008) results that gender diversity and BETA are positively and significantly related to complex environments in a Canadian sample. Additionally, in a survey study, Adams and Funk (2011) point out that women on board take more risk than male counterparts in Swedish companies.

Capital Adequacy (equity capital to total assets) is employed to assess the capital structure of the bank. The coefficient of this variable is negative and significant. Despite the fact that in the positive and significant relationship between cost of equity capital and market beta is discussed in the literature (Botosan & Plumlee 2005; Xie 2011; Fu et al. 2012; Reverte 2012), the empirical evidence of the negative relationship between the equity capital and BETA is provided in this study. A plausible justification for this finding could be that well-capitalized banks' stocks become less volatile than securities in the market (De Jonghe 2010).

Asset Quality (the ratio of net loan charge-offs to total assets) measures the quality of the loan, which is the essential part of the assets in bank balance sheets. As expected, the coefficient of net loan charge-offs to total assets ratio is positive and significant. This finding is in line with Stever's (2007) work that shows that higher charge-offs ratio is the reason of higher beta.

Management Capabilities (salaries & benefits to total assets ratio) and Earnings (excessive loan growth) are found to have negative and significant impacts on BETA. The findings for both variables might imply that the positive signalling (higher salary and benefit payments for senior management and relatively high loan growth than the average of the market) may decline the stock volatility of the bank.

Liquidity (liquid assets to total assets) and Sensitivity are employed to gauge the effects of liquidity and interest rate sensitivity on BETA. The coefficient of Liquidity is negative and significant. De Jonghe (2010) argues that market-wide events slightly affect more

liquid institutions; as expected, higher Liquidity declines BETA in the sample. The difference between interest rate sensitive assets and interest rate sensitive liabilities relative to total assets is the sensitivity measure in this study. The coefficient of Sensitivity is positive and significant. This result highlights that an increase in interest rates make the bank stocks more volatile even if the gap (the difference between interest rate sensitive assets and interest rate sensitive liabilities) grows.

Bank Size is found to have a positive and significant effect on BETA. The result in line with Laeven et al. (2014) and Gandhi and Lustig (2010) empirical findings that large banks face more systematic risk. As expected, the coefficient of HH-Index that measures the ownership concentration of banks is positive and significant. The systematic risk increases at banks with concentrated ownership. This finding that may point out the benefit of private control of blockholders provides a similar result with Konijn et al. (2011) work that detects a positive and significant relationship between grouped HH-Index and BETA in the US sample.

Institutional Ownership is employed to assess the effect of the institutional investment on BETA. The coefficient of Institutional Ownership is positive and significant in which the increased institutional ownership percentage increases the systematic risks of banks. In the literature, the reason of the positive relationship between institutional ownership and systematic risk is discussed widely. The Large trading volume of institutional investments Lee (1992), noise trading of institutional investors Brown and Brooke (1993), herding behaviour of institutional investors Sias (2004), short-term investment activities of institutional investors are discussed.

Individual Ownership that covers individual and family investments and Public Ownership is found to have a negative and significant impact on BETA. These results contradict the anticipated relationships in which individual ownership and public ownership has a negative effect on systematic risk. Other Ownership that classifies unknown ownership types also has negative coefficient, but it is not significant.

GDP Change, Interest Rate Change, and Market Concentration are the variables that are employed to control the industry. The coefficient of GDP Change is negative and

significant. A plausible justification for this finding could be that the systematic risk declines at market expansion periods. The coefficients of Interest Change and Market Concentration variables are positive and significant. These findings highlight that the systematic risk increases at the volatile environment regarding interest rate in the economy and the highly concentrated market.

Column 2, Table 33 provides the estimation results of the model with one-quarter forwarded BETA. Executive Connection and 16 in 18 control variables hold the signs and significance levels in one-quarter forwarded estimations. Institutional Investment is the only variable that changes the sign in one-quarter forwarded estimation. Other Ownership variable becomes significant in Column 2.

The estimation results in Column 3, Table 33 provide the effect of Executive Connection and control variables on two-quarter forwarded BETA. Executive Connection variable holds the sign and still significant at 1 percent. 15 in 18 control variables provide the same signs and significance level. The change in sign is only detected in Institutional Ownership variable; this variable provides a positive sign in Column 1.

The three-quarter forwarded BETA estimation results are provided in Column 4, Table 33. Executive Connection and control variables hold the signs and significance levels, except Institutional Ownership that becomes insignificant in Column 4.

The estimation results in Column 4, Table 33, provide the effect of connected executive appointment and control variables on four-quarter forwarded BETA. Executive Connection and 16 in 18 control variables give the same signs and coefficient levels. Other Ownership variable becomes significant at 10 percent in Column 5. The only sign change is detected in Institutional Ownership variable.

Table 33: The effect of executive connection on bank performance: BETA

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as Market Beta (BETA). Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. CAMELS ratios & size, ownership variables are calculated from the average values for each bank. Following Singh and Davidson III (2003), CAMELS ratios are in mean difference form. Ownership structure variables are binary variables that equals to 1 if ownership percentage of the observation is greater than the mean of ownership percentage of the specified group. Executive age, tenure, and gender are calculated from the average values for each executive at banks from. Market & industry variables are calculated from the country averages of quarterly data. Seasonality effect that refers to a set of specific characteristics of quarters in time is considered in the estimations. In Column 1, current values of BETA are used in estimations. In Columns 2, 3, 4, and 5, BETA values are carried forward one, two, three, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	0.5041***	0.1613***	0.1030***	0.1519***	0.1446***
	(0.020)	(0.013)	(0.013)	(0.016)	(0.016)
Executive Age	0.6943***	0.5753****	0.5965***	0.5516***	0.5204***
	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
Executive Tenure	-0.0128***	-0.0076***	-0.0163***	-0.0164***	-0.0187***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Executive Gender	0.0743***	0.0306***	0.0205***	0.0465***	0.0502***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Capital Adequacy	-0.0245***	-0.0266***	-0.0304***	-0.0283***	-0.0287***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Asset Quality	0.1221***	0.0924***	0.1055***	0.1971***	0.0941***
	(0.009)	(0.009)	(0.009)	(0.007)	(0.011)
Management Capabilities	-0.1711***	-0.1463***	-0.1592***	-0.1212***	-0.1946***
	(0.010)	(0.011)	(0.011)	(0.014)	(0.016)
Earnings	-0.0132***	-0.0199***	-0.0168***	-0.0195***	-0.0173***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Liquidity	-0.0086***	-0.0063***	-0.0075***	-0.0080***	-0.0088***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sensitivity	0.3830***	0.3130***	0.2436***	0.2375***	0.2088***
	(0.014)	(0.014)	(0.014)	(0.015)	(0.016)
Bank Size	0.1276***	0.1398***	0.1527***	0.1372***	0.1379***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
HH-Index	1.4090***	1.3831***	1.4697***	1.5659***	1.3430***
	(0.053)	(0.052)	(0.054)	(0.057)	(0.059)
Institutional Ownership	0.0308***	-0.0155***	-0.0189***	0.0045	-0.0166***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Individual Ownership	-0.0893***	-0.1462***	-0.2053***	-0.2027***	-0.1883***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Public Ownership	-0.0838***	-0.0891***	-0.1119***	-0.0587***	-0.0383***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Other Ownership	-0.0066	-0.0260***	-0.0505***	-0.006	-0.0105*
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
GDP Change	-0.0235***	-0.0191***	-0.0052*	-0.0328***	-0.0274***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Interest Rate Change	0.1184***	0.2379***	0.0938***	-0.0534**	0.1008***
	(0.015)	(0.017)	(0.018)	(0.021)	(0.022)
Market Concentration	0.1510***	0.3786***	0.2740***	0.3976***	0.4551***
	(0.010)	(0.011)	(0.011)	(0.010)	(0.009)
Intercept	-4.5173***	-5.0502***	-4.7927***	-4.9017***	-5.0038***
	(0.058)	(0.066)	(0.060)	(0.062)	(0.063)
No. of observations	134593	122387	122212	114819	113417
R2	0.1518	0.1597	0.1684	0.1788	0.1644

Executive Connection variable that measures the effect of connected executive appointment and control variables give the same signs and significant results in most of the forwarded estimations. Other Ownership variable that is employed to cover the maximum amount of ownership information changes the significance level at different forwarded estimations. The sign and significance change is only detected in Institutional Ownership variable. A reasonable justification for this change could be that institutional investors may apply different investment strategies at different stages of their investment processes. Additionally, these findings provide the information that the defined relationships in the estimation models hold for at least one year period.

5.2.3. Effect of connected executive appointment on Tobin's Q

The findings of the univariate analyses point out that the average Tobin's Q in connected banks is significantly greater than the average Tobin's Q in non-connected banks. Additionally, these findings show that the average Tobin's Q after the appointment of connected executives in connected banks is greater than the average Tobin's Q before the appointment in the same banks. The multivariate analysis that is explained in the third model and shown in Column 1, Table 34 analyses the effect of connected executive appointment and control variables on Tobin's Q.

Executive Connection is employed to gauge the effect of connected executive appointment on Tobin's Q. Finding is in line with Huang et al. (2009), Brochet and Welch (2011), Fracassi and Tate (2012), Minton et al.'s (2012) work that finds negative relationship between financial expertise of executive and Tobin's Q. Connected Executives are also defined as outside directors if they are appointed to boards. Adams and Mehran (2012) find a no significant effect of outside directors on firm value in US bank sample. A fair justification for this finding could be that connected executive appointment decreases the firm value of publicly-listed US banks, which is measured by Tobin's Q on behalf of the affiliated institutional investor.

Executive Age is found to have a negative and significant impact on Tobin's Q. Liang et al. (2013) find a negative and insignificant relationship between executive age and profitability of Chinese banks, which is measured by return on assets. In a similar vein,

this finding provides a negative and significant association between executive age and firm value.

Executive Tenure, which is positive and significant at 1 percent, is employed to measure the effect of executive tenure on Tobin's Q. McIntyre et al. (2007) and McKnight and Weir (2009) works find a negative and insignificant relationship between CEO and board tenure and Tobin's Q. The finding is in line with Simsek (2007) work that points out that long-tenured CEOs, who gain related skills, have knowledge of the company and industry.

Executive Gender is employed to measure the effect of gender diversity. Contrary to Adams and Ferreira (2009), Campbell and Minguez-Vera (2008), and Carter et al. (2003) studies that mention the positive and significant relationship between gender diversity and Tobin's Q in the US sample, findings provide negative and significant relationship. The possible reason of this could be the effect of gender diversity, which creates more questions and increases the conflicts on boards (Lau & Murnighan 1998).

Capital Adequacy that is measured by the ratio of equity capital to total assets is found to have a negative and significant effect on Tobin's Q. Higher Ben-Horim and Callen (1989) empirically report that the cost of equity capital and Tobin's Q are negatively related in which the relationship may provide a reverse relationship.

Asset Quality (net loan charge-offs to total loans) is employed to assess the effect of net loan charge-offs (scaled by total assets) on firm value. Deng and Elyasiani (2008) find a negative but insignificant relationship between net loan charge-offs and Tobin's Q in US bank holding companies at geographically diversified locations. As expected, the relationship is negative and statistically significant in which better loan performance increases bank value.

Management Capabilities that is measured by salaries & benefits on total assets ratio is employed to assess the effect of management efficiency on bank value. In the samples of non-financial firms, Yermack (1996) and Frye (2004) points out the positive relationship between officer and director equity-based compensation and Tobin's Q. The relationship

is positive and significant between Management Capabilities and Tobin's Q. This finding partially supports Palia and Porter's (2004) work that detects the positive but insignificant effect of the change in the sum of salary, bonus, and other compensation of executives on Tobin's Q in US banks.

Earnings, Liquidity, and Sensitivity are found to have positive and significant effects on Tobin's Q. Lang and Maffett (2011) provide that there is a negative relationship between illiquidity and Tobin's Q. A fair justification for these findings could be that firm value increases if bank's loan growth is relatively greater than the market average; if the proportion of bank's liquid assets increase in total assets; if the proportion of the difference between interest rate sensitive assets and interest rate sensitive liabilities increases in bank's total assets.

Bank Size, which is measured by the natural logarithm of total assets, is found to have a positive and significant effect on Tobin' Q. González (2005) concludes that there is a positive relationship between size and Tobin's Q in cross-country sample. The finding states that firm value increases by bank size. Additionally, contrary to Mura's (2007) work that finds a negative relationship between block holding and firm value, the coefficient of HH-index that measures the ownership concentration is positive.

Institutional Investment is employed to measure the effect of the institutional investment on firm value. Contrary to McConnel and Servaes' (1990) work that finds a positive and significant relationship between institutional ownership and firm value and Woidtke's (2002) work that points out the positive effect of institutional investment on Tobin's Q of private pension funds, Institutional Ownership is found to have a negative and significant impact on Tobin's Q. Elyasiani and Jia (2010) point out that institutional ownership stability is positively related to firm value. The plausible explanation of this negative relationship could be explained by the investment strategy of institutional investors in which institutional investors may invest short term periods that prevent them from monitoring.

Individual Ownership is found to have a negative effect on Tobin's Q. Although the family ownership is positively associated with firm performance (Villalonga & Amit

2006; Arregle et al. 2007; Miller et al. 2008), monitoring of management is expensive for individual investors to increase the firm value. As expected, Individual Ownership, which includes family and individual investors, declines bank value. Additionally, Public Ownership and Other Ownership are found to have a positive and significant effect on Tobin's Q.

In order to control the industry, GDP Change, Interest Rate Change, and Market Concentration are employed. The coefficient of GDP Change is positive and significant in which bank value is positively related to economic growth. On the other hand, the coefficient of Interest Rate Change is negative and significant, which indicates that bank value declines in an economic environment that suffers from high-interest rate change. Market Concentration is negatively related to bank value in which firm value declines in the market that is dominated by large banks.

The estimation results in Column 2, Table 34, provide the effect of connected executive appointment and control variables on one-quarter forwarded Tobin's Q. The coefficient of Executive Connection and control variables hold the signs and significance level in one-quarter forwarded estimations.

The estimations in Column 3, Table 34 provide the estimation results of two-quarter forwarded Tobin's Q. There is no sign and significance level change detected in Executive Connection and 16 control variables. The coefficient of HH-Index becomes negative and significant at 10 percent in two-quarters forwarded estimations. As expected, the coefficient of Institutional Ownership is positive and significant in two-quarters forwarded estimations.

The three-quarter forwarded Tobin's Q estimation results are provided in Column 4, Table 34. The coefficient sign of Executive Connection becomes positive; the coefficient of Institutional Ownership becomes positive and significant in three-quarters forwarded estimations. The coefficient of Public Ownership becomes negative, while and 16 in 18 control variables holds the sign and significance levels.

Table 34: The effect of executive connection on bank performance: Tobin's Q

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as Tobin's Q. Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. CAMELS ratios & size, ownership variables are calculated from the average values for each bank. Following Singh and Davidson III (2003), CAMELS ratios are in mean difference form. Ownership structure variables are binary variables that equals to 1 if ownership percentage of the observation is greater than the mean of ownership percentage of the specified group. Executive age, tenure, and gender are calculated from the average values for each executive at banks from. Market & industry variables are calculated from the country averages of quarterly data. Seasonality effect that refers to a set of specific characteristics of quarters in time is considered in the estimations. In Column 1, current values of Tobin's Q are used in estimations. In Columns 2, 3, 4, and 5, Tobin's Q values are carried forward one, two, three, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	-0.2943***	-0.2240***	-0.0516***	0.1217***	0.2695***
	(0.009)	(0.010)	(0.013)	(0.019)	(0.024)
Executive Age	-0.3698***	-0.2553***	-0.1240***	-0.0835***	-0.1026***
	(0.009)	(0.009)	(0.008)	(0.008)	(0.009)
Executive Tenure	0.0074***	0.0062***	0.0080***	0.0129***	0.0116***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Executive Gender	-0.0742***	-0.0485***	-0.0554***	-0.0445***	-0.0519***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Capital Adequacy	-0.0374***	-0.0334***	-0.0294***	-0.0219***	-0.0202***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Asset Quality	-0.5935***	-0.6114***	-0.5243***	-0.5215***	-0.4952***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)
Management Capabilities	0.3111***	0.2847***	0.2901***	0.3462***	0.4743***
	(0.012)	(0.010)	(0.010)	(0.012)	(0.016)
Earnings	0.0260***	0.0189***	0.0283***	0.0286***	0.0328***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Liquidity	0.0042***	0.0040***	0.0056***	0.0057***	0.0074***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sensitivity	0.0692***	0.0607***	0.1411***	0.1234***	0.1954***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Bank Size	0.0905***	0.0797***	0.0646***	0.0691***	0.0805***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
HH-Index	0.0056	0.0058	-0.0699*	0.0042	-0.0561
	(0.043)	(0.043)	(0.040)	(0.039)	(0.037)
Institutional Ownership	-0.0909***	-0.0283***	0.0098***	0.0572***	0.1048***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Individual Ownership	-0.0584***	-0.0216***	-0.0150***	-0.0143***	-0.0117***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Public Ownership	0.0993***	0.0782***	0.0753***	-0.0093***	-0.0227***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Other Ownership	0.1325***	0.1136***	0.0973***	0.0907***	0.1296***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
GDP Change	0.0283***	0.0561***	0.1386***	0.1941***	0.1544***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Interest Rate Change	-0.4245***	-0.0440***	-0.0103***	-0.2439***	0.2348***
	(0.011)	(0.011)	(0.012)	(0.014)	(0.014)
Market Concentration	-0.6141***	-0.8049***	-0.7707***	-0.8525***	-0.8129***
	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)
Intercept	3.6713***	4.0730***	3.5244***	3.5895***	3.3418***
	(0.046)	(0.046)	(0.045)	(0.045)	(0.044)
No. of observations	139681	127090	127014	120313	116792
R2	0.3375	0.3871	0.4063	0.4271	0.4140

The estimation results of four-quarter forwarded Tobin's Q are shown in Column 5, Table 34. The coefficient of Executive Connection becomes positive and significant. The coefficients of HH-Index, Institutional Ownership, Public Ownership, Interest Rate Change, and Market Concentration change, while 13 of control variables holds the signs and significance levels.

The sign of Institutional Ownership changes after two-quarter forwarding. The expected positive effect of institutional investment is captured after six months of the appointment of connected executives. Most of the control variables that are employed in these estimations provide the similar coefficients regarding sign and significance level.

5.3. Robustness Tests

In order to verify the sustainability of the estimations, some robustness tests are employed. First, it is examined that whether estimation results are driven by the sample of banks that do not appoint connected executives. The approach that is applied in estimations captures the effect of connected executives on the whole sample. As an alternative way, propensity score matching is used to match the sample of banks with and without connected executives. The matched sample of banks in control sample is selected by estimating a probit model of the likelihood of "connection". The matched sample diagnostics and estimated parameters are reported in Appendix E, Table 38. The propensity score difference larger than 5 percent leaves a smaller sample. The matched samples for the first estimation model (NIITTA) and the third estimation models (Tobin's Q) consist of 260 banks (65 of them appoint connected executives). The matched sample for the second estimation model (BETA) consists of 252 banks (63 of them appoint connected executives). The models are re-estimated by using the matched banks that do not appoint connected executives instead of the whole sample. According to re-estimated results, Executive Connection is found to have a positive and statistically significant impact on NIITTA. The same signs and significance levels are detected in estimations with forwarded NIITTA. Additionally, the sign and significance levels of most of the control variables stay the same in the re-estimations with matched sample (Appendix E, Table 39). The re-estimation of BETA with matched sample provides the same sign and significance level of the coefficient of Executive Connection. Moreover, the coefficients

of Executive Connection hold the positive signs and similar significance levels in forwarded BETA estimations (Appendix E, Table 40). The coefficient of Executive Connection is negative and significant in the re-estimated model of Tobin's Q with matched sample, and this is in line with the previous results. The forwarded Tobin's Q estimations provide same signs and significance levels at each stage. The only exception is detected in two-forwarded Tobin's Q; the coefficient of Executive Connection is still negative but insignificant in the re-estimation with matched sample (Appendix E, Table 41). In brief, the same signs and significance levels of the coefficients of Executive Connection are gathered from the estimations with matched sample.

Second, it is examined that the results of the estimations are whether driven by the interactions between ownership structure of banks and CAMELS rating components. Although the ownership types are considered and used as control variables in the estimations, the effect of concentrated ownership on CAMELS rating variables is ignored. Concentrated ownership is let the institutional investors act as a "blockholder" and directly affect the corporate decisions (Crama et al. 2003). In the models, HH-Index that is employed to measure the effect of ownership concentration on bank performance provides different coefficient signs at different forwards in which ownership concentration affects corporate decisions at different capacities. In the models, CAMELS related variables are directly related to corporate decisions that may be affected by ownership concentration. In order to control the CAMELS variables that may be affected by ownership concentration, six interaction terms are employed rather than CAMELS variables in the early form of the models. These interaction terms are constructed for each CAMELS variable that is multiplied by the concentrated institutional investor dummy. In order to find the concentrated institutional investor dummy, two-step calculation process is followed. In the first step, the mean of HHI is calculated in order to create the dummy variable of HHI in which if the HHI of the observation is above the mean of the HHI of the sample; it is 1, otherwise 0. In the second step, the dummy variable that comes from the first step is multiplied by the institutional ownership mean difference dummy. The re-estimation results show that the coefficient of Executive Connection is positive and significant in the re-estimated model of NIITTA and it is consistent with the sign and significance level of the early version of the estimations. Also, the signs and significance

levels of the coefficient hold in forwarded Tobin's Q estimations (Appendix F, Table 42). According to re-estimated results, Executive Connection is found to have a positive and significant impact on BETA. In forwarded BETA estimations, the signs and significance levels are in line with the results of the previous estimations (Appendix F, Table 43). The re-estimation of Tobin's Q with interaction terms provides the same sign and significant level of the coefficient of Executive Connection. Similar results are gathered in the forwarded Tobin's Q estimations (Appendix F, Table 44). For three of these performance measures, the re-estimations with interactions terms mostly provide similar signs and significance levels of the coefficients of the control variables in forwarded stages of the estimations. Briefly, the results of the re-estimations with interactions terms are in line with the estimation results of the models.

6. Conclusion

During the last two decades, corporate scandals and technological developments changed the nature of investment decisions as well as the governance concept all around the world. Additionally, differentiated role definitions within the firms make the principal-agent problem worse. In this condition, conventional agency theory definitions become insufficient to answer the principal-agent problem, and new approaches that are derived from the corporate governance-related research questions become more vital. Although the classical view covers the conflicts between agents and principals or controlling and non-controlling shareholders, the conflict between current and potential shareholders is a new perspective that needs to be explored. In this paper, the purpose is to show the presence of this conflict to contribute the literature that expands in the new era of governance concept. By analysing over 8,000 detailed biographies of board members and managers of more than 800 publicly-listed US banks, institutional investor-connected executives are isolated from the sample to detect the conflict between current and potential shareholders by employing a series of univariate and multivariate analyses. Highly regulated US banking system is designed to construct the safety and soundness of the industry that may create more severe principal-agent problem and allows the conclusion that the effect of the appointment of connected executives on ownership structure and performance is the strong signal of conflict between current and potential shareholders.

The findings of the univariate analysis of institutional ownership reveal that institutional investment at banks significantly increases after the appointment of connected executives. The same analyses are employed at each bank that appoints connected executives and shows that there is a significant institutional ownership increase at connected banks after the appointment of most of the connected executives. The findings of the univariate analysis of ownership concentration are in the similar vein; the ownership concentration increases after the appointment of connected executives either in the whole sample or in each bank that appoints connected executive. The plausible justification for these findings could be that institutional investor-connected executives change the ownership structure and ownership concentration. Furthermore, multivariate analyses are performed to detect the effect of institutional investor-connected executives on bank performance. As an accounting performance measure, the ratio of non-interest income to total assets (NIITTA), which shows the non-interest income from the non-traditional business activities of banks, is an important measure to the performance of executives. The findings of the multivariate analyses show that the appointment of the connected executive has a positive and significant impact on NIITTA. The connection also points out the industry experience of executives and helps banks to diversify their income from non-traditional business activities. Despite the fact that market beta (BETA) is mostly employed as a risk measure to detect the stock return volatility, it is employed as a performance measure in this paper. The logic behind the use as a performance measure is to decide the change in volatility for the all investors in the market. If the bank's stock price becomes more volatile, the institutional investors, who are affiliated to connected executives, may use their information advantages against other investors in the market. The findings of the multivariate analyses show that the appointment of connected executive significantly increases the market beta. The last performance measure, Tobin's Q, is employed to the effect of appointment of the connected executive on bank value. Undervalued bank stock provides an investment advantage for the affiliated institutional investor that has an information advantage. The findings reveal that the appointment of connected executive significantly decreases the value of the banks that appoint connected executive(s). In most cases, results also show that the appointment of the connected executive affects the performance for at least one-year period. The robustness checks validate the results of the multivariate analyses.

Overall, the empirical evidence suggests that the appointment of the institutional investor-connected executive reshapes the ownership structure and ownership concentration. In univariate analysis of the study points out that institutional investment in connected banks increases after the appointment of connected executives. This finding is also supported by the findings of univariate analysis of individual banks. On the other hand, the findings also suggest that the appointment of the connected executives influences the ownership concentration of the banks. These findings raise the question: why do institutional investor-connected executives affect the listed US bank performance? However, this study does not assess the influence of investment strategies of institutional investors (i.e., whether institutional investors invest for the long-term period that allows them to be proactive to corporate decisions), the appointment effect on different performance measures is specified.

After the appointment of connected executives, listed US banks become more "well-performing" regarding accounting performance. The base model that shows the direct effect of appointment of the connected executive on NIITTA and the forwarded forms clearly point out that the accounting performance of the banks increases after the appointment. Moreover, after the appointment of connected executives, listed US banks become more "undervalued" in terms of Tobin's Q and more volatile, which is measured by BETA in the stock market for the investors and this might allow affiliated institutional investors to use their information advantage.

The appointment of board members and professional managers increases the institutional investment, increases the ownership concentration, and affects bank performance if they have previous connections with institutional investors of the bank. The regulators should closely watch the individuals in the industry by forcing them to release their detailed biographies that provide previous professional activities and construct the mechanisms to track their appointments. Additionally, regulators should inform the society regularly to create information transparency in the industry.

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Appendix A: Theoretical Framework

The purpose of this section is to introduce a new dimension of agency theory by applying a series of theoretical frameworks. The characteristics of a corporation and the consequences of the separation of ownership and control of companies are briefly discussed to understand the nature of principal-agent problem. The commitments and evolution of the agency theory over time to answer the changing conditions might be helpful to introduce a new dimension of the theory.

1. The pillars of a corporation

From the early ages to the modern era of human history, people need organisations for their social and physical needs. In western societies, the first examples of corporations that are subject to legal rights appeared in ancient Rome (Berman, 2009). In the process, the design of today's modern corporations is dated to colonial era (Bowman, 2010).

In general, the purpose of a corporation is to contribute capital, labour, and knowledge for different parties who are keen to benefit from these contributions. Although economic theories are inadequate to define the exact purpose of a corporation (Orts, 2013), corporate law is clear on it. Ruskola (2014, p. 638) states that 'despite the economic, political, and social importance of the corporate form, we do not have an accepted legal theory of what a corporation is, apart from the law's questionable assertion that it is a "person"'. According to corporate law, corporations have legal personalities when they are incorporated, and they can stay alive as long as they have capital.

One of the benefits of the legal personality of a corporation is the limited liability of a shareholder. Limited liability refers to the limited accountability of shareholders for the debt of the companies. With this capacity, the liability depends on the fraction of shares that shareholder holds (Blankenburg et al., 2010). The limited accountability of shareholders is not only for the debt of the company but also for any actions that would result in a penalty.

Despite the limited accountability, shareholders have the ability to transfer the holding shares freely in which shareholders can control the risk that they take by investing (Williamson, 1981). Different than in partnership, transferability in a corporation makes the transactions at lower costs and increases the liquidation of shares. On the other hand, the business conduct of a corporation is not interrupted by any changes of shareholders.

Transferability is not the only difference between a partnership/other standard-form legal entity and a corporation. In a partnership, every partner "has a co-equal say in the affairs of the company" (Monks and Minow, 2011, p. 12). In a corporation, centralised management is a principal in which directors are responsible for the all direction of the company and managers are responsible for the daily operations of the company.

In sum, legal personality, limited liability, transferability, and centralised management are the essential characteristics of a corporation (Kraakman et al., 2009, p. 6). Notwithstanding the benefits of a corporation that is evolved to answer the needs, consequences of them would become vital in which the researchers from different disciplines try to investigate.

2. Consequences of separation of ownership and control

There are two clear consequences of the separation of ownership and control: construction of board of directors as a result of centralised management and limited liability characteristics of a corporation and principal-agent problem as a result of different interests of components of a company.

2.1. Formation of board of directors and its features

As mentioned above, centralised management is one of the characteristics of a corporation. Today, it is common for nearly all large companies that are invested by shareholders. The main purpose of the centralised management is to increase productivity and efficiency, while allowing the investors, who have limited liabilities, to participate management of a company with delegated individuals. In a partnership or other standard form legal entity, partners have equal rights on affairs of the company. Hence the size of

the company and the subject of the business that the partnership is involved allow partners to involve into the management (Blackett-Ord and Haren, 2015, p. 2).

On the other hand, the board of directors or similar committee establishment are vested by corporate law at corporations. The formation purpose of the board of directors that are periodically elected by shareholders is the corporate affairs of the company. There are four main features of the board of directors.

The first feature is the distinction of the board of directors from shareholders. Theoretically, the board of directors are distinct from the shareholders to reduce the decision-making costs, which might be increased by controlling shareholders on their behalf. With the purpose of protecting shareholders, who hold a small fraction of shares, the distinction of the board of directors of shareholders allows minority shareholders and stakeholders of the company to reliable information about the affairs of the company (Monks and Minow, 2011).

The second feature is the formation of a board of directors with more than one board member. There are few examples of one director boards in which the member is the general director of the company in some European countries.

The third feature is the election of the board of directors by shareholders. The idea behind the election of the board of directors is to keep the board of directors as an instrument of shareholders on the corporate affairs of the company (Easterbrook and Fischel, 1983).

The fourth feature is the separation of ownership and control. Theoretically, the board of directors are separate from the managers, who are responsible for the daily operations of the company. The exception of this formation is the two-tier board structure in European countries. In two-tier board structure, managers might be nominated to be the members of the second tier (managerial) board, while the members of the first tier (supervisory) board are elected by shareholders (Jungmann, 2007).

The legal distinction between the board of directors and managers aim to separate corporate affairs and daily basis transactions of a company. Also, the distinction allows

the board of directors to monitor the quality of decision-making of managers (Monsen et al., 1968). Different than the purpose of the legal distinction between ownership and control, companies faced principal-agent problem in the modern era.

2.2. Principal-agent problem

Apart from the property rights theory in which the allocation of costs and rewards among participants is determined by the specification of individual rights (Coase, 1937, 1959, 1960), principal-agent problem has become the root of many theoretical and empirical studies.

In a corporation, principal refers to one or more individuals, who hold the shares. Principal, who is distinct from the board of directors, has limited liability on the debt of the company, and regularly elect the board of directors. Agent refers to managers, who work under the contract to manage day-to-day operations of the company. According to Jensen and Meckling (1976, p. 308), the relationship between principal and agent is defined as "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent".

In an economic approach, the principal-agent problem is compensation selection bias that produces agent behaviour different than the preferences of principal (Ross, 1973). Different than the supporters of the theory of the firm (Alchian and Demsetz, 1972; Baumol, 1959; Williamson, 1964), this perspective shows that the principal-agent problem is a common issue in society – not a specific challenge for a company. Additionally, it produces a general decision-making approach under uncertainty conditions than the previous studies (Arrow, 1963; Spence and Zeckhauser, 1971).

In an institutional approach, the organisation is constructed around an agent rather than a principal, since principals do not take the risk that excess their limited liability. Thus the source of principal-agent problem is an agent that tends create imperfections in relations (Mitnick, 1973). The source of imperfection is information asymmetry that comes from the information advantage of an agent, which comes from manager's professional

experience and access to daily transactions of a company. Under uncertainty, the decision-making if an agent – is expected to act on behalf of a principal – might bring out moral hazard in which an agency might have an incentive to misbehave (Arrow, 1968).

2.3. Agency Theory

In the previous section, the characteristics of a corporation and the consequences of the separation of ownership and control of companies are briefly discussed. In this section, the evolution of the agency theory is investigated.

2.3.1. Agency theory: Early examples

The first discussion of separation of ownership and control appeared at the beginning of the last century. The growing complexity and increasing volume of trade differentiated the structure of the business as well as the economic entities. After the hike of trade for last two centuries, corporations became more important for each layer of societies. The principal-agent problem has arisen after the separation of ownership and control became essential as a part of the modern corporation.

As an early example, Berle and Means (1932) identified separation of ownership and control as an essential problem. They pointed out the problem as a result of conflict between principals and agents in that: "The separation of ownership from control produces a condition where the interests of owner and of ultimate manager may, and often do, diverge, and where many of the checks which formerly operated to limit the use of power disappear" (Berle and Means, 1932, p. 7). In the last decades, Berle and Means (1932)' work has become the basis of the agency theory.

Agency problem has become one of the key concepts for scholars, who want to incorporate in economics, political science, and any other fields. As a contribution to accounting literature, Cooper (1949) used principal-agent problem to discuss the agents in the company in the late 1940s. In his research of economic theory of democracy, Downs (1957) employed agents to integrate government and private decision makers in a single equilibrium. In sociology, Swanson (1971) referred agency problem in order to

detect the link between collectivities. Pitkin (1967) discussed the evolution of representative government by using the same language of agency problem in political sciences.

2.3.2. Agency Theory: The heart of corporate governance

As a pioneering work, Ross (1973) delineated the mechanism of results of diverging interests of principals and agents. According to him, optimal compensation contract of an agent depends on manager' risk taking in the case of ignoring profit maximisation goal of principals as a result of diverging interests.

In order to describe the control of a public company, Jensen and Meckling (1976) provided the first satisfactory explanation by proposing agency theory. In their inspiring research, Fama and Jensen (1983) developed their theory to focus decision process of an organisation by controlling agency problems. The reason of controlling agency problems is a separation of ownership and control; agents bear the risk on their decisions and do not take the major outcome. This condition diverges agents' decisions, which become sharply different than the core of the principal interests. Thus determining the optimal contract between principal and agent is the most efficient way to resolve the principal-agent problem.

In a corporate governance evaluation study, Daily et al. (2003) point out that agency theory perspective is widely used to define and gauge corporate governance. According to him, by reducing the number of components from many to two (principal and agent), agency theory simplifies the evaluation of corporate governance related issues. Additionally, agency theory relies on a simple trust: human's self-interest. Agency theory is not only simple to apply, but also most applied theoretical perspective in corporate governance (Dalton et al., 1999; Fama, 1980b; Ferreira et al., 2011; Karolyi, 2006).

2.3.3. Agency Theory: Conflict between principals

In agency theory structure, managers benefit themselves at the expense of shareholders by using the information advantage (i.e. excessive compensation, building empire). They

are monitored by the board of directors internally and managerial labour market externally. Board of directors legally represents shareholders by not violating the discrepancy feature of the board of directors. Formal constraints (judicial reviews and courts) provide formal protection for shareholders. On the informal side of the protection, shareholders expect the managers to follow shareholder wealth maximisation norm (Young et al., 2008). In agency theory literature, the conflict between principal and agent is investigated at all capacity.

On the other hand, another form of conflict arises between controlling shareholders and non-controlling shareholders. Gillan and Stark (2005) point out that the magnitude and nature of agency problems are directly related to ownership structure. Therefore, it is an expected result that controlling shareholders might benefit themselves at the expense of non-controlling shareholders. In an extreme form, Johnson et al. (2000) point out the controlling shareholders' resource transferring out of companies as a fraudulent activity. Compared to the conflict between principal and agent, formal protection for non-controlling shareholders against controlling shareholders is not enough in the US, but better than continental Europe (La Porta et al., 1999c).

As it is mentioned above, non-controlling shareholders might be on the target of controlling shareholders. On the other hand, the presence of controlling shareholder reduces the principal-agent problem in which non-controlling shareholders might take the advantage from the non-controlling shareholders by reducing the cost of monitoring. Gilson and Gordon (2003) identify the trade-off on non-controlling shareholders. "Non-controlling shareholders will prefer the presence of a controlling shareholder so long as the benefits from a reduction in managerial agency costs are greater than the costs of private benefits of control" (Gilson and Gordon, 2003, p. 785).

Given all that has been mentioned so far, one may sure that agency theory is widely used in social sciences, especially in corporate governance. The growing corporate governance literature for more than eight decades has been defined most of the aspects of the principal-agent problem in corporations. In the next phase, the literature might be able to delineate different aspects of principal-agent problem sourced from outside of corporations.

Appendix B: List of Sample Banks

Table 35: The list of publicly-listed US banks with total assets above $1 billion as of 31st of December 2013.

Bank	Total Assets	Bank	Total Assets
1867 Western Financial Corporation	2.2	Hawthorn Bancshares, Inc.	1.1
1st Source Corporation	4.7	Heartland Financial USA, Inc.	5.9
1st United Bancorp, Inc.	1.8	Heritage Commerce Corp	1.5
ACNB Corporation	1	Heritage Financial Corporation	1.7
Affiliated Managers Group, Inc.	6.3	Heritage Financial Group, Inc.	1.4
Alerus Financial Corporation	1.4	Heritage Oaks Bancorp	1.2
Ally Financial Inc.	150	HF Financial Corp.	1.3
American Business Bank	1.4	Hills Bancorporation	2.2
American Capital, Ltd.	6	Hilltop Holdings Inc.	8.9
American Express Company	150	Hingham Institution for Savings	1.4
American International Group, Inc.	540	Home BancShares, Inc.	6.8
American National Bankshares Inc.	1.3	HomeTrust Bancshares, Inc.	1.6
Ameris Bancorp	3.7	Horizon Bancorp	1.8
AmeriServ Financial, Inc.	1.1	Hudson City Bancorp, Inc.	39
Ames National Corporation	1.2	Hudson Valley Holding Corp.	3
Anchor BanCorp Wisconsin Inc.	2.1	Huntington Bancshares Incorporated	59
Annaly Capital Management, Inc.	82	IBERIABANK Corporation	13
Apollo Investment Corporation	3.4	Independent Bank Corp.	6.1
Ares Capital Corporation	8.1	Independent Bank Corporation	2.2
Arrow Financial Corporation	2.2	Independent Bank Group, Inc.	2.2
Associated Banc-Corp	24	International Bancshares Corporation	12
Astoria Financial Corporation	16	Intervest Bancshares Corporation	1.6

Banc of California, Inc.	3.6	Isabella Bank Corporation	1.5
BancFirst Corporation	6	iStar Financial Inc.	5.6
Bancorp, Inc.	4.7	JPMorgan Chase & Co.	2400
BancorpSouth, Inc.	13	KCG Holdings, Inc.	7
Bank First National Corporation	1.1	Kearny Financial Corp. (MHC)	3.3
Bank Mutual Corporation	2.3	KeyCorp	93
Bank of America Corporation	2100	KKR Financial Holdings LLC	8.7
Bank of Hawaii Corporation	14	Lakeland Bancorp, Inc.	3.3
Bank of Kentucky Financial Corp.	1.9	Lakeland Financial Corporation	3.2
Bank of Marin Bancorp	1.8	Legg Mason, Inc.	7
Bank of New York Mellon Corp.	370	LNB Bancorp, Inc.	1.2
Bank of the Ozarks, Inc.	4.8	M&T Bank Corporation	85
BankFinancial Corporation	1.5	Macatawa Bank Corporation	1.5
BankGuam Holding Company	1.3	MainSource Financial Group, Inc.	2.9
BankUnited, Inc.	15	Marquette National Corporation	1.5
Banner Corporation	4.4	MB Financial, Inc.	9.6
Bar Harbor Bankshares	1.4	MBT Financial Corp.	1.2
BB&T Corporation	180	Mechanics Bank	3.4
BBCN Bancorp, Inc.	6.5	Mercantile Bank Corporation	1.4
BCB Bancorp, Inc.	1.2	Merchants Bancshares, Inc.	1.7
Berkshire Hills Bancorp, Inc.	5.7	Meta Financial Group, Inc.	1.8
BGC Partners, Inc.	2.1	MetLife, Inc.	890
Blackrock Kelso Capital Corporation	1.3	Metro Bancorp, Inc.	2.8
BlackRock, Inc.	220	Middleburg Financial Corporation	1.2
Blackstone Group L.P.	30	MidSouth Bancorp, Inc.	1.9
BNC Bancorp	3.2	Monarch Financial Holdings, Inc.	1

BofI Holding, Inc.	3.6	Morgan Stanley	830
BOK Financial Corporation	27	MutualFirst Financial, Inc.	1.4
Boston Private Financial Holdings, Inc.	6.4	NASB Financial, Inc.	1.2
Bridge Bancorp, Inc.	1.9	National Bank Holdings Corporation	4.9
Bridge Capital Holdings	1.6	National Bankshares, Inc.	1.1
Brookline Bancorp, Inc.	5.3	National Penn Bancshares, Inc.	8.6
Bryn Mawr Bank Corporation	2.1	NBT Bancorp Inc.	7.7
BSB Bancorp, Inc.	1.1	New Hampshire Thrift Bancshares, Inc.	1.4
Burke & Herbert Bank & Trust Co.	2.6	New York Community Bancorp, Inc.	47
C&F Financial Corporation	1.3	NewBridge Bancorp	2
Cambridge Bancorp	1.5	Nicolet Bankshares, Inc.	1.2
Camden National Corporation	2.6	North Dallas Bank & Trust Co.	1.2
Canandaigua National Corporation	2	Northern Trust Corporation	100
Cape Bancorp, Inc.	1.1	Northrim BanCorp, Inc.	1.2
Capital Bank Financial Corp.	6.6	Oaktree Capital Group, LLC	45
Capital City Bank Group, Inc.	2.6	Ocean Shore Holding Co.	1
Capital One Financial Corporation	300	OceanFirst Financial Corp.	2.2
Capitol Federal Financial, Inc.	9.1	Ocwen Financial Corporation	7.9
Cardinal Financial Corporation	2.9	OFG Bancorp	8.2
Cascade Bancorp	1.4	Old Line Bancshares, Inc.	1.2
Cass Information Systems, Inc.	1.3	Old National Bancorp	9.6
Cathay General Bancorp	11	Old Second Bancorp, Inc.	2
CenterState Banks, Inc.	2.4	Oppenheimer Holdings Inc.	3
Central Pacific Financial Corp.	4.7	Oritani Financial Corp.	2.9
Central Valley Community Bancorp	1.1	Orrstown Financial Services, Inc.	1.2
Century Bancorp, Inc.	3.4	Pacific Continental Corporation	1.4

Charles Schwab Corporation	140	Pacific Premier Bancorp, Inc.	1.7
Charter Financial Corporation	1.1	PacWest Bancorp	6.5
Chemical Financial Corporation	6.2	Palmetto Bancshares, Inc.	1.1
Chemung Financial Corporation	1.5	Park National Corporation	6.6
CIT Group Inc.	47	Peapack-Gladstone Financial Corp.	2
Citigroup Inc.	1900	PennantPark Investment Corporation	1.3
Citizens & Northern Corporation	1.2	Penns Woods Bancorp, Inc.	1.2
City Holding Company	3.4	Peoples Bancorp Inc.	2.1
City National Corporation	30	Peoples Bancorp of North Carolina, Inc.	1
CME Group Inc.	54	Peoples Financial Services Corp.	1.7
CNB Financial Corporation	2.1	People's United Financial, Inc.	33
CoBiz Financial Inc.	2.8	PHH Corporation	8.8
Codorus Valley Bancorp, Inc.	1.2	Pinnacle Financial Partners, Inc.	5.6
Colony Bankcorp, Inc.	1.1	PNC Financial Services Group, Inc.	320
Columbia Banking System, Inc.	7.2	Popular, Inc.	36
Comerica Incorporated	65	Porter Bancorp, Inc.	1.1
Commerce Bancshares, Inc.	23	Preferred Bank	1.8
Community Bank System, Inc.	7.1	Premier Financial Bancorp, Inc.	1.1
Community Bankers Trust Corp.	1.1	PrivateBancorp, Inc.	14
Community Financial Corporation	1	Prosperity Bancshares, Inc.	19
Community Trust Bancorp, Inc.	3.6	Provident Financial Holdings, Inc.	1.1
CommunityOne Bancorp	2	Provident Financial Services, Inc.	7.5
ConnectOne Bancorp, Inc.	1.7	Prudential Financial, Inc.	730
Cowen Group, Inc.	1.8	Pulaski Financial Corp.	1.3
CU Bancorp	1.4	QCR Holdings, Inc.	2.4
Cullen/Frost Bankers, Inc.	24	Raymond James Financial, Inc.	22

Customers Bancorp, Inc.	4.2	Regions Financial Corporation	120
CVB Financial Corp.	6.7	Renasant Corporation	5.7
Dacotah Banks, Inc.	2.1	Republic Bancorp, Inc.	3.4
Dime Community Bancshares, Inc.	4	S&T Bancorp, Inc.	4.5
Discover Financial Services	79	Sandy Spring Bancorp, Inc.	4.1
Doral Financial Corporation	8.5	Seacoast Banking Corp. of Florida	2.3
E*TRADE Financial Corporation	46	ServisFirst Bancshares, Inc.	3.5
Eagle Bancorp, Inc.	3.8	Shore Bancshares, Inc.	1.1
East West Bancorp, Inc.	25	SI Financial Group, Inc.	1.3
Eastern Virginia Bankshares, Inc.	1	Sierra Bancorp	1.4
Enterprise Bancorp, Inc.	1.8	Signature Bank	22
Enterprise Financial Services Corp	3.2	Simmons First National Corporation	4.4
ESB Financial Corporation	1.9	SLM Corporation	11
ESSA Bancorp, Inc.	1.4	Solar Capital Ltd.	1.7
Exchange Bank	1.8	South State Corporation	7.9
F.N.B. Corporation	14	Southeastern Bank Financial Corp.	1.7
Fannie Mae	3300	Southern BancShares (N.C.), Inc.	2.2
Farmers & Merchants Bancorp	2.1	Southside Bancshares, Inc.	3.4
Farmers & Merchants Bank of Long Beach	5.2	Southwest Bancorp, Inc.	2
Farmers Capital Bank Corporation	1.8	State Bank Financial Corporation	2.6
Farmers National Banc Corp.	1.1	State Street Corporation	240
Federal Agricultural Mortgage Corp.	13	Sterling Bancorp	6.7
Fidelity Southern Corporation	2.6	Stifel Financial Corp.	9
Fifth Street Finance Corp.	2.5	Stock Yards Bancorp, Inc.	2.4
Fifth Third Bancorp	130	Stonegate Bank	1.1
Financial Institutions, Inc.	2.9	Suffolk Bancorp	1.7

First Bancorp	3.2	Summit Financial Group, Inc.	1.4
First Bancorp, Inc.	1.5	Sun Bancorp, Inc.	3.1
First BanCorp.	13	SunTrust Banks, Inc.	180
First Busey Corporation	3.5	Susquehanna Bancshares, Inc.	18
First Business Financial Services	1.3	SVB Financial Group	26
First Citizens Banc Corp	1.2	SWS Group, Inc.	3.9
First Citizens BancShares, Inc.	21	Synovus Financial Corp.	26
First Commonwealth Financial Corp.	6.2	T. Rowe Price Group, Inc.	5
First Community Bancshares, Inc.	2.6	TCF Financial Corporation	18
First Connecticut Bancorp, Inc.	2.1	TD Ameritrade Holding Corporation	22
First Defiance Financial Corp.	2.1	Texas Capital Bancshares, Inc.	12
First Farmers and Merchants Corp.	1.1	Tompkins Financial Corporation	5
First Financial Bancorp.	6.4	TowneBank	4.7
First Financial Bankshares, Inc.	5.2	Tri City Bankshares Corporation	1.2
First Financial Corporation	3	TriCo Bancshares	2.7
First Guaranty Bancshares, Inc.	1.4	TriState Capital Holdings, Inc.	2.3
First Horizon National Corporation	24	TrustCo Bank Corp NY	4.5
First Interstate BancSystem, Inc.	7.6	Trustmark Corporation	12
First Merchants Corporation	5.4	U.S. Bancorp	360
First Mid-Illinois Bancshares, Inc.	1.6	UMB Financial Corporation	17
First Midwest Bancorp, Inc.	8.3	Umpqua Holdings Corporation	12
First National Bank Alaska	3.1	Union Bankshares Corporation	4.2
First National Community Bancorp	1	United Bankshares, Inc.	8.7
First National of Nebraska, Inc.	16	United Community Banks, Inc.	7.4
First NBC Bank Holding Company	3.3	United Community Financial Corp.	1.7
First Niagara Financial Group, Inc.	38	Univest Corporation of Pennsylvania	2.2

First of Long Island Corporation	2.4	USAmeriBancorp, Inc.	2.9
First United Corporation	1.3	Valley National Bancorp	16
FirstMerit Corporation	24	Washington Federal, Inc.	14
Flagstar Bancorp, Inc.	9.4	Washington Trust Bancorp, Inc.	3.2
Flushing Financial Corporation	4.7	WashingtonFirst Bankshares, Inc.	1.1
Fox Chase Bancorp, Inc.	1.1	Waterstone Financial, Inc.	1.9
Franklin Resources, Inc.	16	Webster Financial Corporation	21
Freddie Mac	2000	Wells Fargo & Company	1500
Fulton Financial Corporation	17	WesBanco, Inc.	6.1
German American Bancorp, Inc.	2.2	West Bancorporation, Inc.	1.4
GFI Group Inc.	1.2	West Suburban Bancorp, Inc.	2
Glacier Bancorp, Inc.	7.9	Westamerica Bancorporation	4.8
Goldman Sachs Group, Inc.	910	Western Alliance Bancorporation	9.3
Great Southern Bancorp, Inc.	3.6	Westfield Financial, Inc.	1.3
Guaranty Bancorp	1.9	Wilshire Bancorp, Inc.	3.6
Guaranty Bancshares, Inc.	1.2	Wilson Bank Holding Company	1.7
Hamilton State Bancshares, Inc.	1.6	Wintrust Financial Corporation	18
Hampton Roads Bankshares, Inc.	2	WSFS Financial Corporation	4.5
Hancock Holding Company	19	Yadkin Financial Corporation	1.8
Hanmi Financial Corporation	3.1	Zions Bancorporation	56

Source: SNL Financial, Author calculations.

Appendix C: List of Connected Executives

Table 36: The list of connected executives, current employers, and affiliated institutional investors of the banks as of 31st of December 2013.

ID	Executive Name	Bank Name	Institutional Investor
1	Abbie J Smith, Mrs	Ryder System, Inc	UBS
2	Adam J Shapiro, Mr	Northeast Bancorp	Goldman Sachs
3	Alex A Diffey, Mr	NewBridge Bancorp	Wells Fargo
4	Alice P Frazier, Mrs	Cardinal Financial Corporation	BB&T Corporation
5	Allen J. Gula Jr., Mr	Synovus Financial Corp	Franklin Resources, Inc.
6	Anat M Bird, Mrs	WSFS Financial Corporation	Sun Bancorp
7	Andrew B Cheney, Mr	Ameris Bancorp	Mercantile Bank Corp
8	Andrew C L Dyson, Mr	Affiliated Managers Group, Inc.	BlackRock
9	Andrew J Iseman, Mr	UMB Financial Corporation	Janus Capital Group
10	Anthony Cosentino, Mr	SB Financial Group, Inc	Fifth Third Bancorp
11	Barbara M Conley, Mrs	First Business Financial Services, Inc.	Associated Bank
12	Barry F Berthelot, Mr	Iberiabank Corporation	JP Morgan
13	Barry Z Dodson, Mr	NewBridge Bancorp	FNB Financial Services Corp
14	Breck Hanson, Mr	Associated Banc-Corp.	Bank of America
15	Brian Swanson, Mr	BofI Holding Inc	Bank of America
16	Brian M Flynn, Mr	Lakeland Bancorp, Inc	TD Banknorth
17	Bruce R Singletary, Mr	Capital Bank Financial Corp	Bank of America
18	Burney S Warren, Mr	National Bank Holding Corporation	BB&T
19	Catherine A Rein, Miss	Bank of New York Mellon Corporation	MetLife, Inc.
20	Chang Ming M Liu	Banc of California	U.S. Bank
21	Chantal D. Simon, Mrs	People's United Financial, Inc	Merrill Lynch
22	Charles J. Gries, Mr	MB Financial Inc	First Oak Brook Bancshares
23	Chris C Casciato, Mr	Cascade Bancorp	Goldman Sachs
24	Christopher Marshall, Mr	Capital Bank Financial Corp	Fifth Third Bancorp
25	Clayton Stuart Rose, Mr	Bank of America Corporation	J.P. Morgan
26	Curtis A Hoff, Mr	Ames National Corporation	State Bank

27	Curtis C Simard, Mr	Bar Harbor Bankshares	TD Bank
28	D. Bruce Knox, Mr	WesBanco, Inc.	Oak Hill Financial
29	Daniel M. FitzPatrick	Webster Financial Corp	BNY Mellon
30	Daniel W. Cook III, Mr	TD Ameritrade Holding Corporation	Goldman Sachs
31	David E Borowy, Mr	Bay National Corporation	Mercantile Bank Corp
32	David Hugh Sidwell, Mr	Fannie Mae	Morgan Stanley
33	David J Vetta, Mr	First Business Financial Services, Inc.	JP Morgan
34	David L Stein, Mr	Associated Banc-Corp.	Bank One Corporation
35	David L Stoehr, Mr	Wintrust Financial Corporation	Associated Bank
36	David S Bagatelle, Mr	Sterling Bancorp Inc	Provident Bank
37	David S Yanagisawa, Mr	Lakeland Bancorp, Inc	TD Banknorth
38	David W Cathell, Mr	ACNB Corporation	Fulton Bancshares Corp
39	Deborah Kuenstner, Mrs	Boston Private Financial Holdings Inc	Merrill Lynch
40	Dennis A Suskind, Mr	CME Group Inc	Goldman Sachs
41	Donald H. Layton, Mr	AIG	J.P. Morgan
42	Donald P. Johnson, Mr	American Business Bank	American Business Bank
43	Donald S Guthrie Jr, Mr	Bryn Mawr Bank Corporation	First Keystone Corporation
44	Donald T. Parker, Mr	BOK Financial Corporation	Comerica Bank
45	Donna N Smith, Mrs	Associated Banc-Corp.	Bank of America
46	Douglas L Kennedy, Mr	Peapack-Gladstone Financial Corp	North Fork Bank
47	Elizabeth Reizman, Mrs	Bank of Marin Bancorp	Bank of California
48	Eugene M. McQuade	Citigroup Inc	Freddie Mac
49	Frank D Filipo, Mr	Suffolk Bancorp	North Fork Bank
50	Gary G. Lynch, Mr	Bank of America Corporation	Morgan Stanley
51	Gary N Geisel, Mr	M&T Bank Corporation	Provident Bankshares Corp
52	Gary P Liotta, Mr	Flushing Financial Corporation	Morgan Stanley
53	Gary S. Shedlin, Mr	BlackRock, Inc	Morgan Stanley
54	Gaylin Anderson	Banc of California	U.S. Bank
55	George F Bacigalupo, Mr	Berkshire Hills Bancorp Inc	TD Bank
56	Gregory Garrabrants , Mr	BofI Holding Inc	Goldman Sachs

57	Gregory Tusar, Mr	KCG Holdings, Inc.	Goldman Sachs
58	Gregory H Kozich, Mr	PNC Financial Services Group Inc	Fannie Mae
59	Gregory J Fleming, Mr	Morgan Stanley	Morgan Stanley
60	H. E. Timanus JR,	Prosperity Bancshares, Inc	Heritage Bankshares, Inc.
61	Hilliard C. Terry III, Mr	Umpqua Holdings Corporation	Goldman Sachs
62	Iris S. Chan, Mrs	East West Bancorp, Inc	Wells Fargo
63	J. Chandler Martin, Mr	CommunityOne Bancorp	Bank of America
64	J. Harvey White, Mr	Pinnacle Financial Partners, Inc.	Regions Financial Corp
65	Jack L Kopnisky, Mr	Sterling Bancorp Inc	KeyCorp
66	James D. Rollins III, Mr	Bancorpsouth, Inc.	Prosperity Bancshares, Inc
67	James Edward Rohr, Mr	BlackRock, Inc	PNC Financial
68	James J Manseau, Mr	Bridge Bancorp, Inc	North Fork Bancorporation
69	James R Engebretsen, Mr	Farmer Mac	Lehman Brothers
70	James Schrecongost, Mr	MutualFirst Financial Inc	Old National Bancorp
71	Jay Curtis Horgen, Mr	Affiliated Managers Group, Inc.	Goldman Sachs
72	Jay S. Wintrob, Mr	AIG	SunTrust Banks, Inc.
73	Jeffrey Cannon, Mr	Optimumbank Holdings, Inc.	Regions Financial Corp
74	Jeffrey M Levy, Mr	NBT Bancorp, Inc.	M&T Bank
75	Jeffrey S. Flug, Mr	PennantPark Investment Corporation	Goldman Sachs
76	Jennifer R. Evans, Mrs	Privatebancorp, Inc.	MAF Bancorp Inc.
77	Jerome J Gassen, Mr	Ameriana Bancorp	Old National Bank
78	Jess Roman, Mr	Bnccorp, Inc.	Heritage Bankshares, Inc.
79	Jide J Zeitlin, Mr	Affiliated Managers Group, Inc.	Goldman Sachs
80	John Simacek, Mr	LNB Bancorp, Inc	Fifth Third Bank
81	John A. Kanas, Mr	BankUnited, Inc	North Fork Bancorporation
82	John A Thain, Mr	CIT Group, Inc	Goldman Sachs
83	John F Spencer, Mr	Carver Bancorp, Inc	JP Morgan Chase
84	John H Schaefer, Mr	Annaly Capital Management Inc	Morgan Stanley
85	John J Letter, Mr	Ameriana Bancorp	Old National Bank
86	John L Donnelly, Mr	JPMorgan Chase & Co	Citigroup
87	John L Klinck, Mr	State Street Corporation	Mellon Financial Corp

88	John Mark Swadba, Mr	Hudson Valley Holding Corp	Merrill Lynch
89	John M Eggemeyer III, Mr*	Heritage Commerce Corp	PacWest Bancorp
90	John P Hammerschmidt, Mr	Bear State Financial Inc	First Federal Bank
91	John R Chrin, Mr	Astoria Financial Corporation	JP Morgan
92	John S Fleshood, Mr	Wintrust Financial Corporation	Fifth Third Bancorp
93	John T Lane, Mr	First of Long Island Corporation (The)	J.P. Morgan
94	John T Taylor, Mr	Porter Bancorp, Inc.	PNC Bank
95	John W. Rose, Mr	Jacksonville Bancorp, Inc.	FNB Corp
96	Jonathan W Witter, Mr	Capital One Financial Corporation	Morgan Stanley
97	Joseph H. Moglia, Mr	TD Ameritrade Holding Corporation	Merrill Lynch
98	Joseph J. Prochaska Jr., Mr	Synovus Financial Corp	MetLife
99	Joseph Kissel	BankUnited, Inc	Wells Fargo
100	Joseph V Roller, Mr	Cambridge Bancorp	Bay Bancorp Inc
101	Joseph W Veccia, Mr	1st United Bancorp, Inc.	Royal Bank of Canada
102	Josephine Iannelli, Mrs	Berkshire Hills Bancorp Inc	PNC Financial
103	Kenneth R Lammersfeld, Mr	Baylake Corporation	Associated Bank
104	Kevin G Byrnes, Mr	Bay Bancorp Inc	Provident Financial Holdings, Inc
105	Kevin M O'Connor, Mr	Bridge Bancorp, Inc	North Fork Bancorporation
106	Larry A Raymon , Mr	Ames National Corporation	United Bankshares, Inc.
107	Larry L. Helm, Mr	Texas Capital Bancshares, Inc	Bank One Corporation
108	Lars C Anderson, Mr	Comerica Incorporated	BB&T Corporation
109	Lawrence Ostermayer, Mr	1st United Bancorp, Inc.	Bank of America
110	Lewis P Jones, Mr	Carver Bancorp, Inc	JP Morgan Chase
111	Louis M. Cosso	BBCN Bancorp, Inc	Wells Fargo
112	Lowell A. Seifter, Mr	NBT Bancorp, Inc.	Bridge Street Financial
113	Lynn D Asensio, Mrs	WesBanco, Inc.	Fifth Third Bank
114	Marc Denis Oken, Mr	Capital Bank Financial Corp	Bank of America
115	Margaret D. Tutwiler	CIT Group, Inc	Merrill Lynch
116	Mark G. Sander, Mr	First Midwest Bancorp, Inc	Associated Bank

117	Mark P Bagnoli, Mr	BankUnited, Inc	JPMorgan
118	Mark W Funke, Mr	Southwest Bancorp, Inc	Bank of Oklahoma
119	Marshall J Beverley, Mr	First National Corporation	BB&T
120	Martha M. Hayes, Mrs	Anchor BanCorp Wisconsin Inc	Merrill Lynch
121	Martin S Friedman, Mr	Access National Corporation	Anchor Bancorp Wisconsin, Inc.
122	Merrill S Wall, Mrs	Western Alliance Bancorporation	Zions Bancorporation
123	Michael Daly, Mr	Hudson City Bancorp Inc	JP Morgan
124	Michael D Mulford, Mr	First Defiance Financial Corp	Key Bank
125	Michael P Lyons, Mr	PNC Financial Services Group Inc	Bank of America
126	Michael R Orsino, Mr	Suffolk Bancorp	KeyCorp
127	Michael Stanley Bickerton, Mr	LNB Bancorp, Inc	KeyCorp
128	Michael W Dosland, Mr	Bank Mutual Corporation	First Federal Bankshares, Inc
129	Michele B Estep, Mrs	Sun Bancorp, Inc	KeyBank
130	Michele D Trolli, Mrs	M&T Bank Corporation	Franklin Resources, Inc.
131	Muneera S Carr, Mrs	Comerica Incorporated	SunTrust Banks, Inc.
132	Nathan Duda, Mr	Banc of California	Union Bankshares Corporation
133	Navtej Singh Nandra, Mr	E*Trade Financial Corporation	Merrill Lynch
134	Nelson J. Chai, Mr	CIT Group, Inc	Bank of America
135	Patrick J Derpinghaus, Mr	Associated Banc-Corp.	U.S. Bank
136	Paul D. Allison, Mr	Raymond James Financial Inc	Merrill Lynch
137	Peter E. Raskind, Mr	Capital One Financial Corporation	PNC
138	Peter K. Barker, Mr	Franklin Resources, Inc.	JPMorgan
139	Peter R Catanese, Mr	LNB Bancorp, Inc	Charter One Bank
140	Peter Y Kim, Mr	BBCN Bancorp, Inc	Center Financial Corporation
141	R. Eugene Taylor, Mr	Capital Bank Financial Corp	Bank of America
142	R. Terry Bennett, Mr	Farmers Capital Bank Corporation	First Citizens Banc Corp
143	Ralph F. Boyd Jr., Mr	Sandy Spring Bancorp, Inc.	Freddie Mac
144	Randy R Melbym	BankUnited, Inc	Wells Fargo

145	Rhodes R Bobbitt, Mr	Hilltop Holdings Inc	Goldman Sachs
146	Richard B. Barton, Mr	Banner Corporation	Bank of America
147	Richard C. Hartnack, Mr	Freddie Mac	JPMorgan
148	Richard J. Himelfarb, Mr	Stifel Financial Corp	Legg Mason
149	Richard L Schroeder, Mr	Bank Mutual Corporation	Guaranty Bank
150	Richard M. Marotta, Mr	Berkshire Hills Bancorp Inc	KeyCorp
151	Richard S Michalek, Mr	Riverview Bancorp Inc	Bank of America
152	Richard U. Newfield Jr., Mr	National Bank Holding Corporation	Bank of America
153	Richard W Stafford , Mr	Peoples Bancorp Inc., Ohio	Citizens First Bancorp, Inc
154	Robert A Chereck, Mr	SWS Group Inc	Wells Fargo
155	Robert B. Crowl, Mr	PHH Corporation	Sun Bancorp, Inc
156	Robert B. Goldstein, Mr	Palmetto Bancshares, Inc	FNB Corporation
157	Robert C Golden, Mr	Dime Community Bancshares, Inc	Prudential Financial
158	Robert E Henel, Mr	Sandy Spring Bancorp, Inc.	Mercantile Bankshares Corp
159	Robert F Heinrich, Mr	LNB Bancorp, Inc	Fifth Third Bank
160	Robert Gerard Jones, Mr	Old National Bancorp	KeyCorp
161	Robert Hermann Benmosche, Mr	AIG	Metlife
162	Robert J Cera, Mr	Baylake Corporation	Associated Bank
163	Robert M Kottler, Mr	Iberiabank Corporation	Capital One Financial Corporation
164	Robert M. Curley, Mr	Berkshire Hills Bancorp Inc	Charter One Bank
165	Robert R Reed, Mr	Simplicity Bancorp, Inc	Bank of America
166	Robert R Tarter, Mr	Carver Bancorp, Inc	State Street Corporation
167	Robin S Hager, Mr	NewBridge Bancorp	FNB Financial Services Corporation
168	Russell W. Rizzardi, Mr	Westamerica Bancorporation	Wells Fargo
169	Saiyid T. Naqvi, Mr	Freddie Mac	PNC
170	Scot E Warren, Mr	CME Group Inc	Goldman Sachs
171	Scott McBrair, Mr	Anchor BanCorp Wisconsin Inc	First Niagara Bank
172	Scott A Belair, Mr	Hudson City Bancorp Inc	Morgan Stanley
173	Scott B Kauffman, Mr	CommunityOne Bancorp	Goldman Sachs

174	Scott F Powers, Mr	State Street Corporation	Old Mutual
175	Sean A. Gray, Mr	Berkshire Hills Bancorp Inc	Bank of America
176	Simon E Powley	Washington Federal Inc	Bank of America
177	Stephen A Melton, Mr	Ameris Bancorp	Synovus Financial Corp
178	Stephen J Gilhooly, Mr	1st Constitution Bancorp	Florida Community Banks, Inc.
179	Stephen J Sipola, Mr	Astoria Financial Corporation	North Fork Bank
180	Stephen S Crawford, Mr	Capital One Financial Corp.	Morgan Stanley
181	Steven Graham Elliott, Mr	Huntington Bancshares Inc	BNY Mellon
182	Steven Jeffrey Goulart, Mr	Metlife, Inc.	Morgan Stanley
183	Steven W Cribbs, Mr	Metro Bancorp, Inc	UMB Financial Corporation
184	Susan F. Stevens, Mrs	Umpqua Holdings Corporation	JP Morgan
185	Suzanne R. Brennan, Mrs	PacWest Bancorp	Guaranty Bancorp
186	T. Allen A Liles, Mr	Carolina Bank Holdings, Inc.	American National Bankshares
187	Tani Girton, Mrs	Bank of Marin Bancorp	Charles Schwab&Co.
188	Terry E Zink, Mr	Cascade Bancorp	Fifth Third bank
189	Thomas G Kahn, Mr	Sterling Bancorp Inc	Provident Bank
190	Thomas G. Maheras, Mr	Discover Financial Services	Citigroup
191	Thomas J Shara, Mr	Lakeland Bancorp, Inc	TD Banknorth
192	Thomas Kell Montag, Mr**	Bank of America Corporation	Merrill Lynch&Co.
193	Thomas L. Hasty III, Mr	Towne Bank	BB&T
194	Thomas P. Gibbons, Mr	PHH Corporation	BNY Mellon
195	Thomas S Elley, Mr	United Security Bancshares, Inc.	Iberiabank
196	Timothy J Matteson, Mr	Lakeland Bancorp, Inc	TD Banknorth
197	Ulderico Calero	Umpqua Holdings Corporation	Citigroup
198	Victor J Nesi, Mr	Stifel Financial Corp	Merrill Lynch
199	Virginia N Heine, Mrs	Eagle Bancorp, Inc.	BB&T Bank
200	W. Bruce Phelps, Mr	Hawthorn Bancshares Inc	Pulaski Bank
201	William A Hodges, Mr	Capital Bank Financial Corp	Bank of America
202	William B. Littreal, Mr	Towne Bank	FNB Corporation
203	William C Nash, Mr	Farmers Capital Bank Corporation	First Citizens Banc Corp
204	William F Helmer, Mr	Sterling Bancorp Inc	Provident Bank

205	William L Hartmann, Mr	KeyCorp	Citigroup
206	William L. Prater, Mr	Bancorpsouth, Inc.	Regions Financial Corporation
207	William S. Demchak, Mr	BlackRock, Inc	PNC Financial
208	William W Traynham Jr., Mr	American National Bankshares Inc.	Community Bankshares

* John M Eggemeyer III, Mr is also independent non-executive board member at Guaranty Bancorp

** Thomas Kell Montag, Mr is also independent non-executive board member at BlackRock, Inc.

Source: BoardEx

Appendix D: Univariate Analysis of Individual Banks

Table 37: Univariate analysis of each connected bank before and after the appointment of connected executives

This table summarises comparison of means of Institutional Ownership and HH-Index of each connected bank before and after the appointment of the connected executive. Timer period is from 2000 to 2013. Statistical significance of Mean differences is tested using t-test. ID refers to the executive names from Table 8 in Appendix C. In the case of no observation for comparison, it is shown as "No observation before the appointment" in related raw. *, **, *** indicate statistical significance of t-test at the 10%, 5%, and 1% levels respectively.

		Institutional ownership			HH-Index		
ID	Bank	Before	After	t score	Before	After	t score
1	Ryder System, Inc	60.49	75.602	-0.81	0.0241	0.0281	-0.44
2	Northeast Bancorp	23.2939	48.6085	-5.45***	0.028	0.0328	-1.22
3	NewBridge Bancorp	2.7522	27.5541	-4.33***	0.0005	0.0122	-2.08**
4	Cardinal Financial Corporation	39.403	81.8569	-7.12***	0.0115	0.031	-10.52***
5	Synovus Financial Corp	53.5491	79.015	-3.31***	0.0681	0.0207	1.68
6	WSFS Financial Corporation	63.8879	83.662	-2.85***	0.0318	0.047	-2.83***
7	Ameris Bancorp	33.6747	81.2388	-5.97***	0.0123	0.0419	-8.43***
8	Affiliated Managers Group, Inc.	83.5179	92.671	-2.48**	0.0167	0.0165	0.07
9	UMB Financial Corporation	54.5574	70.7736	-2.6**	0.0351	0.0332	0.42
10	SB Financial Group, Inc	10.5717	14.8894	-1.84*	0.0089	0.0073	0.59
11	First Business Financial Services	4.855	15.4452	-2.84***	0.0206	0.0136	1.62
12	Iberiabank Corporation	50.6728	92.0925	-7.15***	0.018	0.0213	-2.01*
13	NewBridge Bancorp	4.549	27.8169	-4.14***	0.0007	0.0125	-2.17**
14	Associated Banc-Corp.	39.4593	78.4285	-5.78***	0.0154	0.031	-5.12***
15	BofI Holding Inc	33.6819	69.2225	-4.48***	0.0223	0.0245	-0.38
16	Lakeland Bancorp, Inc	17	33.436	-5.28***	0.0058	0.0116	-5.48***
17	Capital Bank Financial Corp	"No observation before the appointment"					
18	National Bank Holding Corporation	"No observation before the appointment"					
19	Bank of New York Mellon Corp	20.5467	76.7058	-8.95***	0.0042	0.0209	-5.61***

20	Banc of California	19.8614	58.2275	-9.53***	0.0292	0.0223	1.63
21	People's United Financial, Inc	77.6457	73.7586	0.75	0.0168	0.0183	-0.61
22	MB Financial Inc	25.7714	71.649	-8.58***	0.0475	0.0365	1.94*
23	Cascade Bancorp	35.8715	67.5325	-3.83***	0.0867	0.1911	-1.79*
24	Capital Bank Financial Corp	"No observation before the appointment"					
25	Bank of America Corporation	41.2458	47.7117	-2.26**	0.0094	0.0085	0.39
26	Ames National Corporation	8.1563	15.9838	-4.34***	0.0223	0.0139	1.76*
27	Bar Harbor Bankshares	22.6928	44.39	-3.82***	0.0133	0.0161	-1.83*
28	WesBanco, Inc.	25.4282	46.5036	-8.49***	0.0148	0.0213	-4.47***
29	Webster Financial Corp	60.7524	88.3444	-2.41**	0.0252	0.0398	-1.92*
30	TD Ameritrade Holding Corp	51.666	76.6952	-3.62***	0.1532	0.1255	0.65
31	Bay National Corporation	9.2138	8.2305	1.05	0.0018	0.0073	-3.91***
32	Fannie Mae	61.915	18.9324	4.69***	0.0354	0.0054	6.85***
33	First Business Financial Services	4.2	14.7093	-2.82**	0.0205	0.0143	1.11
34	Associated Banc-Corp.	18.0592	68.5259	-11.75***	0.0077	0.0266	-7.47***
35	Wintrust Financial Corporation	22.93	74.4119	-3.59***	0.0083	0.0212	-2.98***
36	Sterling Bancorp Inc	35.8013	62.9767	-4.03***	0.0152	0.0251	-3.7***
37	Lakeland Bancorp, Inc	11.8208	31.6995	-7.52***	0.0046	0.0108	-6.33***
38	ACNB Corporation	2.34	4.6929	-2.69**	0.0002	0.002	-4.37***
39	Boston Private Financial Holdings	45.2142	90.2969	-12.47***	0.0136	0.0274	-7.36***
40	CME Group Inc	64.055	79.1923	-2.29**	0.0171	0.0226	-1.4
41	AIG	31.364	50.432	-4.35***	0.0163	0.0514	-2.92***
42	American Business Bank	1.0685	2.3238	-3.22***	0.0001	0.0004	-2.39**
43	Bryn Mawr Bank Corporation	33.1884	65.9621	-7.2***	0.0453	0.0297	2.34**
44	BOK Financial Corporation	63.0291	83.6429	-2*	0.3014	0.3673	-2.12**
45	Associated Banc-Corp.	45.247	84.5457	-4.16***	0.0179	0.0326	-3.47***

46	Peapack-Gladstone Financial Corp	19.3058	36.4757	-4.7***	0.0197	0.0283	-3.49***
47	Bank of Marin Bancorp	35.6782	42.866	-2.7**	0.0148	0.0165	-1.01
48	Citigroup Inc	38.7458	56.2239	-3.69***	0.0113	0.035	-3.65***
49	Suffolk Bancorp	29.7119	51.125	-5.04***	0.0142	0.0195	-3.37***
50	Bank of America Corporation	41.2458	47.7117	-2.26**	0.0094	0.0085	0.39
51	M&T Bank Corporation	51.7096	80.8795	-5.29***	0.0509	0.0458	0.65
52	Flushing Financial Corporation	72.6965	87.3353	-3.24***	0.0286	0.029	-0.29
53	BlackRock, Inc	59.7249	75.14	-2.39**	0.2194	0.0597	2*
54	Banc of California	19.8614	58.2275	-9.53***	0.0292	0.0223	1.63
55	Berkshire Hills Bancorp Inc	56.8135	81.46	-2.15**	0.0273	0.0268	0.12
56	BofI Holding Inc	12.772	54.2413	-7***	0.0107	0.0279	-3.8***
57	KCG Holdings, Inc.	“No observation before the appointment”					
58	PNC Financial Services Group Inc	52.7825	76.8767	-3.64***	0.014	0.0181	-2.46**
59	Morgan Stanley	50.8629	82.4108	-4.23***	0.0247	0.0694	-7.87***
60	Prosperity Bancshares, Inc	31.3863	75.6461	-6.79***	0.0185	0.0202	-0.63
61	Umpqua Holdings Corporation	39.1267	89.105	-8.73***	0.0132	0.0311	-7.03***
62	East West Bancorp, Inc	64.6343	90.1453	-4.22***	0.0241	0.0228	0.34
63	CommunityOne Bancorp	15.4574	60.07	-6.8***	0.0096	0.116	-7.8***
64	Pinnacle Financial Partners, Inc.	27.9047	72.8156	-12.23***	0.0101	0.0294	-12.13***
65	Sterling Bancorp Inc	35.2669	61.809	-4.1***	0.015	0.0247	-3.79***
66	Bancorpsouth, Inc.	33.4044	66.8344	-5.03***	0.0106	0.0219	-6.73***
67	BlackRock, Inc	59.6829	73.3913	-2.11**	0.2245	0.0581	2.22**
68	Bridge Bancorp, Inc	6.89	25.9133	-7.49***	0.0025	0.0118	-6.45***
69	Farmer Mac	46.7871	62.1548	-1.81*	0.0694	0.0358	3.77***
70	MutualFirst Financial Inc	24.4262	28.9025	-2.3**	0.0111	0.0161	-2.32**
71	Affiliated Managers Group, Inc.	83.3891	92.2255	-2.32**	0.0169	0.016	0.29

72	AIG	44.3285	53.7663	-1.53	0.0254	0.0778	-2.63**
73	Optimumbank Holdings, Inc.	2.2265	9.4	-7.82***	0.0034	0.0519	-7.36***
74	NBT Bancorp, Inc.	28.6959	41.0029	-2.38**	0.0085	0.0154	-3.43***
75	PennantPark Investment Corp	"No observation before the appointment"					
76	Privatebancorp, Inc.	42.7035	81.6569	-4.52***	0.0152	0.0283	-4.43***
77	Ameriana Bancorp	10.658	29.8804	-5.43***	0.0093	0.0157	-1.89*
78	Bnccorp, Inc.	9.455	11.7718	-0.52	0.0206	0.0076	4***
79	Affiliated Managers Group, Inc.	77.1042	88.7834	-1.88*	0.0236	0.0141	4.03***
80	LNB Bancorp, Inc	17.4409	16.5226	0.42	0.0144	0.0115	1.84*
81	BankUnited, Inc	"No observation before the appointment"					
82	CIT Group, Inc	70.4432	93.9363	-5.66***	0.0289	0.0209	1.88*
83	Carver Bancorp, Inc	49.7981	13.4388	4.61***	0.0646	0.3034	-5.67***
84	Annaly Capital Management Inc	54.2024	41.4988	1.21	0.0111	0.0066	1.89*
85	Ameriana Bancorp	24.2464	42.208	-4.79***	0.0121	0.0294	-9.78***
86	JPMorgan Chase & Co	41.688	65.8255	-7.56***	0.0112	0.013	-3.12***
87	State Street Corporation	62.2326	84.6019	-3.99***	0.0181	0.0198	-1.3
88	Hudson Valley Holding Corp	23.4624	42.6483	-3.58***	0.0503	0.0305	1.61
89	Heritage Commerce Corp	26.9396	53.3071	-4.89***	0.0239	0.1307	-2.82***
89	Guaranty Bancorp	67.7586	68.0836	-0.06	0.0545	0.0717	-2.15**
90	Bear State Financial Inc	24.7656	37.4136	-1.65	0.0238	0.4076	-6.33***
91	Astoria Financial Corporation	60.0176	85.0653	-4.39***	0.0277	0.0452	-6.23***
92	Wintrust Financial Corporation	21.3511	81.0827	-6.68***	0.0081	0.0228	-4.94***
93	First of Long Island Corporation	5.5775	32.2972	-6.27***	0.0086	0.0165	-2.48**
94	Porter Bancorp, Inc.	19.3892	40.408	-5.18***	0.1404	0.1377	0.06
95	Jacksonville Bancorp, Inc.	"No observation before the appointment"					
96	Capital One Financial Corporation	72.4689	89.09	-2.21**	0.0247	0.0265	-0.53

97	TD Ameritrade Holding Corp	65.7005	76.2948	-1.63	0.1374	0.1262	0.31
98	Synovus Financial Corp	52.8052	78.9318	-3.56***	0.0696	0.0206	1.8*
99	BankUnited, Inc	34.49	78.83	-4.38***	0.0075	0.0482	-3.97***
100	Cambridge Bancorp	"No observation before the appointment"					
101	1st United Bancorp, Inc.	"No observation before the appointment"					
102	Berkshire Hills Bancorp Inc	56.8135	81.46	-2.15**	0.0273	0.0268	0.12
103	Baylake Corporation	1.3547	2.9967	-6.18***	0.006	0.0018	1.76*
104	Bay Bancorp Inc	5.6866	39.9343	-4.74***	0.0095	0.2776	-5.21***
105	Bridge Bancorp, Inc	2.4715	18.795	-5.59***	0.0011	0.0082	-4.63***
106	Ames National Corporation	0.735	11.2548	-9.52***	0.0268	0.0177	2.18**
107	Texas Capital Bancshares, Inc	82.6623	92.0629	-1.3	0.0228	0.0253	-1.15
108	Comerica Incorporated	56.7842	92.7985	-5.4***	0.0163	0.0225	-3.5***
109	1st United Bancorp, Inc.	"No observation before the appointment"					
110	Carver Bancorp, Inc	47.1443	10.2	3.59***	0.0714	0.3992	-7.41***
111	BBCN Bancorp, Inc	42.31	90.9627	-7.65***	0.0222	0.0345	-4.8***
112	NBT Bancorp, Inc.	28.4168	40.5463	-2.48**	0.0083	0.0151	-3.57***
113	WesBanco, Inc.	33.7238	51.571	-4.61***	0.017	0.0239	-3.96***
114	Capital Bank Financial Corp	"No observation before the appointment"					
115	CIT Group, Inc	71.907	94.1557	-4.9***	0.0281	0.0213	1.53
116	First Midwest Bancorp, Inc	57.2363	85.822	-1.7*	0.0169	0.0324	-3.22***
117	BankUnited, Inc	55.9729	84.226	-2.3**	0.0301	0.0492	-1.45
118	Southwest Bancorp, Inc	58.4536	88.5278	-3.16***	0.0224	0.0373	-4.18***
119	First National Corporation	1.46	2.803	-1.38	0.0012	0.0077	-2.06**
120	Anchor BanCorp Wisconsin Inc	42.5441	17.0357	3.41***	0.0207	0.0099	2.01*
121	Access National Corporation	8.1827	15.5483	-3.51***	0.0087	0.0143	-2.01*
122	Western Alliance Bancorporation	"No observation before the appointment"					

123	Hudson City Bancorp Inc	57.8324	77.04	-3.75***	0.0695	0.0302	0.74
124	First Defiance Financial Corp	39.0957	59.2409	-5.15***	0.0234	0.0218	0.62
125	PNC Financial Services Group Inc	55.1348	76.8056	-2.82***	0.0142	0.0189	-2.6**
126	Suffolk Bancorp	31.6566	53.3238	-4.14***	0.0147	0.0202	-2.98***
127	LNB Bancorp, Inc	15.7924	26.15	-3.48***	0.012	0.0207	-3.97***
128	Bank Mutual Corporation	42.2071	51.9782	-2.8***	0.0897	0.0187	2.73***
129	Sun Bancorp, Inc	34.1506	44.8648	-2.06**	0.0548	0.05	0.48
130	M&T Bank Corporation	38.223	72.5912	-5.31***	0.0393	0.0515	-1.35
131	Comerica Incorporated	61.9419	92.0975	-3.29***	0.0169	0.0237	-3.18***
132	Banc of California	26.4848	73.524	-7.08***	0.0261	0.0309	-0.81
133	E*Trade Financial Corporation	69.9723	93.3743	-2.77***	0.0232	0.0252	-0.47
134	CIT Group, Inc	74.2882	94.959	-3.78***	0.0273	0.0215	1.16
135	Associated Banc-Corp.	42.0783	78.6091	-4.76***	0.0169	0.0298	-3.6***
136	Raymond James Financial Inc	49.6928	70.976	-3.75***	0.0368	0.0337	0.84
137	Capital One Financial Corporation	72.4689	89.09	-2.21**	0.0247	0.0265	-0.53
138	Franklin Resources, Inc.	41.8773	51.505	-1.72*	0.0718	0.0572	0.6
139	LNB Bancorp, Inc	16.1453	19.842	-1.47	0.0126	0.0145	-0.97
140	BBCN Bancorp, Inc	52.252	90.2578	-3.8***	0.0244	0.0353	-3.26***
141	Capital Bank Financial Corp	“No observation before the appointment”					
142	Farmers Capital Bank Corporation	14.5441	25.5786	-3.81***	0.0039	0.0084	-3.27***
143	Sandy Spring Bancorp, Inc.	36.0163	69.4417	-3.81***	0.0127	0.031	-4.99***
144	BankUnited, Inc	“No observation before the appointment”					
145	Hilltop Holdings Inc	60.372	70.1052	-1.61	0.0826	0.0493	2.79***
146	Banner Corporation	55.76	75.9567	-3.62***	0.026	0.0286	-0.86
147	Freddie Mac	42.9811	2.9133	3.34***	0.0154	0.002	2.46**
148	Stifel Financial Corp	63.9755	83.5633	-3.29***	0.0304	0.0241	1.18

149	Bank Mutual Corporation	43.728	51.92	-2.3**	0.0785	0.0192	2.23**
150	Berkshire Hills Bancorp Inc	56.0861	81.3533	-2.41**	0.0273	0.0271	0.04
151	Riverview Bancorp Inc	25.1136	55.2814	-5.13***	0.015	0.0323	-4.42***
152	National Bank Holding Corporation	"No observation before the appointment"					
153	Peoples Bancorp Inc., Ohio	40.4919	62.3388	-3.67***	0.0265	0.0322	-2.24**
154	SWS Group Inc	62.0659	75.9271	-3.26***	0.0223	0.0286	-2.22**
155	PHH Corporation	79.139	92.3186	-1.87*	0.0571	0.0204	1.1
156	Palmetto Bancshares, Inc	0.2125	54.4739	-5.07***	0.0000	0.1446	-4.12***
157	Dime Community Bancshares, Inc	68.7317	77.9575	-1.96*	0.0285	0.0279	0.2
158	Sandy Spring Bancorp, Inc.	31.5983	66.2973	-5.76***	0.0106	0.0283	-7.22***
159	LNB Bancorp, Inc	17.4409	16.5226	0.42	0.0144	0.0115	1.84*
160	Old National Bancorp	4.26	53.2136	-5.62***	0.0046	0.0156	-4.79***
161	American International Group, Inc.	44.9015	53.4311	-1.37	0.0249	0.0814	-2.85***
162	Baylake Corporation	1.3108	1.5917	-1.74*	0.0101	0.0022	7.62***
163	Iberiabank Corporation	56.3207	92.25	-4.8***	0.0177	0.0229	-3.12***
164	Berkshire Hills Bancorp Inc	43.0646	81.8553	-7.52***	0.0241	0.0314	-2.92***
165	Simplicity Bancorp, Inc	57.7719	94.0876	-4.21***	0.026	0.0499	-4.99***
166	Carver Bancorp, Inc	46.6945	40.9452	0.66	0.1122	0.1124	0.00
167	NewBridge Bancorp	15.1973	52.135	-6.91***	0.0038	0.0367	-8.14***
168	Westamerica Bancorporation	45.8965	79.1443	-6.02***	0.0173	0.037	-6.19***
169	Freddie Mac	41.7944	3.444	2.87***	0.0149	0.0024	2.1**
170	CME Group Inc	68.4406	80.4831	-1.92*	0.0175	0.0242	-1.76*
171	Anchor BanCorp Wisconsin Inc	40.7116	17.5183	2.87***	0.0195	0.011	1.49
172	Hudson City Bancorp Inc	66.225	60.166	0.42	0.4076	0.0242	60.46***
173	CommunityOne Bancorp	11.669	48.24	-6.79***	0.0015	0.0904	-8.77***
174	State Street Corporation	53.4965	85.3904	-7.93***	0.0176	0.0197	-1.75*

175	Berkshire Hills Bancorp Inc	48.7368	80.0386	-4.64***	0.0263	0.029	-0.95
176	Washington Federal Inc	66.1964	86.71	-2.03**	0.0202	0.0367	-4.82***
177	Ameris Bancorp	32.3997	80.0622	-6.55***	0.0115	0.0412	-9.65***
178	1st Constitution Bancorp	4.2093	11.792	-10.33***	0.0041	0.0124	-6.14***
179	Astoria Financial Corporation	67.0259	83.4588	-1.98*	0.0313	0.0498	-4.67***
180	Capital One Financial Corporation	72.8586	89.46	-2.08**	0.0248	0.026	-0.34***
181	Huntington Bancshares Inc	47.0881	68.0175	-3.48***	0.0163	0.0205	-1.62
182	Metlife, Inc.	66.5291	92.3473	-2.83***	0.1037	0.0539	2.26**
183	Metro Bancorp, Inc	42.8137	71.83	-2.79***	0.0289	0.0358	-3.65***
184	Umpqua Holdings Corporation	52.6719	88.8733	-2.95***	0.0171	0.0351	-3.98***
185	PacWest Bancorp	58.5459	93.398	-2.63**	0.0381	0.0348	0.35
186	Carolina Bank Holdings, Inc.	13.895	12.3491	1	0.0034	0.0045	-1.44
187	Bank of Marin Bancorp	35.1381	43.5583	-1.86*	0.0145	0.0171	-1.64
188	Cascade Bancorp	36.4877	81.0525	-5.34***	0.1013	0.1886	-2.5**
189	Sterling Bancorp Inc	6.1667	48.6009	-6.66***	0.0029	0.0202	-7.61***
190	Discover Financial Services	62.9947	88.09	-4.79***	0.1686	0.0259	6.46***
191	Lakeland Bancorp, Inc	9.238	31.0939	-8.77***	0.0044	0.0104	-5.78***
192	Bank of America Corporation	41.0361	45.88	-1.78*	0.0097	0.0078	0.95
192	BlackRock, Inc	59.4991	71.238	-1.81*	0.2356	0.056	2.66**
193	Towne Bank	11.98	17.7313	-2.18**	0.003	0.0048	-2.88***
194	PHH Corporation	77.6664	92.488	-2.46**	0.0614	0.0194	1.45
195	United Security Bancshares, Inc.	7.7266	10.142	-1.93*	0.0024	0.0046	-3.25***
196	Lakeland Bancorp, Inc	20.4704	36.9725	-4.12***	0.0065	0.0142	-6.96***
197	Umpqua Holdings Corporation	43.851	89.7362	-6.34***	0.0141	0.0329	-6.82***
198	Stifel Financial Corp	49.4762	87.4206	-4.92***	0.0331	0.025	2.22**
199	Eagle Bancorp, Inc.	15.2331	49.33	-5.37***	0.006	0.0181	-6.82***

200	Hawthorn Bancshares Inc	12.2571	28.5175	-8.24***	0.0069	0.0176	-8.72***
201	Capital Bank Financial Corp	"No observation before the appointment"					
202	Towne Bank	11.0824	17.55	-2.78**	0.0027	0.0048	-3.94***
203	Farmers Capital Bank Corporation	14.8791	19.9446	-1.83*	0.0045	0.0054	-0.68
204	Sterling Bancorp Inc	37.6279	72.296	-4.1***	0.0161	0.0274	-3.28***
205	KeyCorp	52.8924	82.3183	-3.04***	0.0137	0.0181	-3.66***
206	Bancorpsouth, Inc.	24.7208	60.2084	-8.57***	0.0094	0.0175	-5.22***
207	BlackRock, Inc	"No observation before the appointment"					
208	American National Bankshares Inc.	16.8593	24.6584	-2.32**	0.0242	0.0076	2.68**

Appendix E: Results of Estimations for Matched Sample

Table 38: Probit estimation for Propensity Score Matching

This table provides the probit estimation results for propensity score matching to detect the likelihood of connection. The dependent variable (matching criteria) is Bank Connection, a binary variable that equals to 1 if the bank appoints connected executive, 0 otherwise. Following Singh and Davidson III (2003), CAMELS ratios are in mean difference form. Above the mean and below the mean values of variables are used in estimations. Ownership structure variables are binary variables in which they are 1 if ownership percentage of the observation is greater than the mean of ownership percentage of the specified group. Executive related variables (age, tenure, and gender) are calculated from the average values for each executive at banks from 2000Q1 to 2013Q4. Standard errors are provided in parentheses In Column 1, 2, and, 3 provide the probit estimation results for NIITTA, BETA, and Tobin's Q separately. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)
Executive Age	-1.2570***	-0.7423***	-0.7230***
	(0.041)	(0.023)	(0.023)
Executive Tenure	0.0370***	-0.0691***	-0.0784***
	(0.005)	(0.003)	(0.003)
Executive Gender	-0.3144***	-0.0492***	-0.0526***
	(0.021)	(0.011)	(0.011)
Capital Adequacy	-0.0518***	-0.0379***	-0.0376***
	(0.003)	(0.001)	(0.001)
Asset Quality	0.0523**	0.0595***	0.0553***
	(0.023)	(0.014)	(0.014)
Management Capabilities	2.0758***	1.3051***	1.3281***
	(0.042)	(0.025)	(0.025)
Earnings	0.0388***	0.0228***	0.0228***
	(0.002)	(0.001)	(0.001)
Liquidity	-0.0217***	-0.0060****	-0.0057***
	(0.001)	(0.000)	(0.000)
Sensitivity	-0.5351***	0.4592***	0.4347***
	(0.044)	(0.026)	(0.026)
Bank Size	0.1591***	0.2045***	0.2046***
	(0.007)	(0.004)	(0.004)
HH-Index	-4.2518***	-1.5833***	-1.5183***
	(0.309)	(0.136)	(0.135)
Institutional Ownership	0.4697***	0.3058***	0.3106***
	(0.016)	(0.009)	(0.009)
Individual Ownership	-0.1498***	-0.1664***	-0.1621***
	(0.013)	(0.008)	(0.008)
Public Ownership	-0.6006***	-0.1482***	-0.1457***
	(0.014)	(0.008)	(0.008)
Other Ownership	-0.1028***	-0.2642***	-0.2800***
	(0.018)	(0.010)	(0.010)
Intercept	2.2034***	0.0893	0.0451
	(0.183)	(0.104)	(0.101)
No. of observations	57566	134593	139681
Pseudo R2	0.1375	0.0918	0.0941

Table 39: The effects of executive connection on bank performance: NIITTA on propensity score-matched sample

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as non-interest income to total assets ratio (NIITTA) on propensity score-matched sample. Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. CAMELS ratios & size, ownership variables are calculated from the average values for each bank. Following Singh and Davidson III (2003), CAMELS ratios are in mean difference form. Ownership structure variables are binary variables that equals to 1 if ownership percentage of the observation is greater than the mean of ownership percentage of the specified group. In Column 1, current values of NIITTA are used in estimations. In Columns 2, 3, 4, and 5, NIITTA values are carried forward one, two, three, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	0.3530***	0.2698***	0.2453***	0.0891***	0.2161***
	(0.025)	(0.019)	(0.017)	(0.011)	(0.014)
Executive Age	0.3041***	0.2603***	0.2688***	0.3075***	0.1978***
	(0.013)	(0.011)	(0.011)	(0.014)	(0.008)
Executive Tenure	0.0071***	0.0037***	0.0030***	-0.0093***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Executive Gender	-0.0292***	-0.0144***	-0.0230***	-0.0165***	-0.0021
	(0.004)	(0.004)	(0.005)	(0.005)	(0.007)
Capital Adequacy	0.0065***	0.0045***	0.0060***	0.0115***	0.0046***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Asset Quality	-0.0033	0.0155***	0.0274***	-0.0053*	0.0144***
	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Management Capabilities	0.0207***	0.0276***	-0.0904***	-0.0670***	0.0207*
	(0.007)	(0.009)	(0.009)	(0.011)	(0.012)
Earnings	-0.0059***	-0.0017***	-0.0022***	-0.0036***	-0.0012**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Liquidity	0.0001	0.0004**	-0.0009***	-0.0041***	-0.0012***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sensitivity	-0.2683***	-0.1749***	-0.0942***	-0.1949***	-0.0048
	(0.019)	(0.018)	(0.019)	(0.021)	(0.014)
Bank Size	-0.0032*	-0.0197***	-0.0291***	-0.0435***	-0.0177***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
HH-Index	2.1990***	1.6443***	2.1255***	1.6013***	1.3347***
	(0.099)	(0.093)	(0.102)	(0.066)	(0.083)
Institutional Ownership	-0.0563***	-0.0345***	-0.0478***	-0.0695***	-0.0376***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)
Individual Ownership	0.0042	-0.0005	0.0156***	0.0176***	0.0220***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Public Ownership	0.0587***	0.0458***	0.0705***	0.0313***	0.0414***
	(0.004)	(0.004)	(0.005)	(0.006)	(0.004)
Other Ownership	0.0323***	0.0049*	-0.0276***	-0.0995***	-0.0466***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
GDP Change	0.0025	-0.0049***	-0.0016	0.0183***	-0.0058***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Interest Rate Change	0.0452***	0.0413***	0.0017	-0.0551***	0.0887***
	(0.009)	(0.009)	(0.011)	(0.018)	(0.018)
Market Concentration	-0.0694***	-0.0623***	-0.0697***	0.0232***	-0.009
	(0.006)	(0.007)	(0.006)	(0.008)	(0.007)
Intercept	-0.6509***	-0.2108***	-0.0544	-0.2093***	-0.1440***
	(0.048)	(0.039)	(0.041)	(0.052)	(0.032)
No. of observations	30968	25051	24821	23834	22789
R2	0.1519	0.1366	0.1492	0.1485	0.1351

Table 40: The effects of executive connection on bank performance: BETA on propensity score-matched sample

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as a market beta on propensity score-matched sample. Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. CAMELS ratios & size, ownership variables are calculated from the average values for each bank. Following Singh and Davidson III (2003), CAMELS ratios are in mean difference form. Ownership structure variables are binary variables that equals to 1 if ownership percentage of the observation is greater than the mean of ownership percentage of the specified group. In Column 1, current values of BETA are used in estimations. In Columns 2, 3, 4, and 5, BETA values are carried forward one, two, three, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	0.5007***	0.1295***	0.0895***	0.1647***	0.1666***
	(0.019)	(0.012)	(0.012)	(0.014)	(0.014)
Executive Age	0.4157***	0.1689***	0.2010***	0.1424***	0.0919***
	(0.013)	(0.014)	(0.015)	(0.014)	(0.015)
Executive Tenure	0.0063***	0.0099***	-0.001	0.0116***	0.0139***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Executive Gender	0.0932***	0.1593***	0.1058***	0.1396***	0.1539***
	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
Capital Adequacy	-0.0145***	-0.0193***	-0.0190***	-0.0215***	-0.0311***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Asset Quality	0.1114***	0.1380***	0.1285***	0.1233***	0.1213***
	(0.009)	(0.009)	(0.010)	(0.009)	(0.010)
Management Capabilities	-0.5872***	-0.5565***	-0.6481***	-0.5933***	-0.6266***
	(0.008)	(0.009)	(0.008)	(0.011)	(0.011)
Earnings	0.0008	-0.0026***	-0.0016***	-0.0112***	-0.0107***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Liquidity	-0.0110***	-0.0108***	-0.0098***	-0.0108***	-0.0119***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sensitivity	0.5664***	0.5203***	0.5434***	0.5707***	0.5684***
	(0.018)	(0.019)	(0.019)	(0.020)	(0.019)
Bank Size	0.1210***	0.1514***	0.1494***	0.1282***	0.1520***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
HH-Index	1.1361***	1.2223***	0.9516***	1.5086***	1.0748***
	(0.070)	(0.073)	(0.078)	(0.099)	(0.084)
Institutional Ownership	0.1729***	0.0838***	0.1364***	0.1889***	0.1792***
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)
Individual Ownership	-0.0350***	-0.0951***	-0.1917***	-0.1553***	-0.0900***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
Public Ownership	-0.1570***	-0.2021***	-0.2419***	-0.1101***	-0.1355***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
Other Ownership	0.0075	0.0270***	0.0442***	0.0531***	0.0578***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
GDP Change	-0.0144***	-0.0407***	-0.0315***	-0.0475***	-0.0500***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Interest Rate Change	0.3690***	0.6199***	0.5476***	-0.0769***	-0.01
	(0.017)	(0.020)	(0.021)	(0.027)	(0.026)
Market Concentration	0.0239*	0.2864***	0.2326***	0.1791***	0.1910***
	(0.013)	(0.015)	(0.013)	(0.014)	(0.012)
Intercept	-3.0570***	-3.4342***	-3.1996***	-2.5883***	-2.8216***
	(0.067)	(0.075)	(0.074)	(0.078)	(0.073)
No. of observations	95040	83298	82536	76348	75515
R2	0.2063	0.2206	0.2329	0.2294	0.2354

Table 41: The effects of executive connection on bank performance: Tobin's Q on propensity score-matched sample

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as Tobin's Q on propensity score-matched sample. Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. CAMELS ratios & size, ownership variables are calculated from the average values for each bank. Following Singh and Davidson III (2003), CAMELS ratios are in mean difference form. Ownership structure variables are binary variables that equals to 1 if ownership percentage of the observation is greater than the mean of ownership percentage of the specified group. In Column 1, current values of Tobin's Q are used in estimations. In Columns 2, 3, 4, and 5, Tobin's Q values are carried forward one, two, three, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	-0.2223***	-0.1697***	-0.0114	0.1578***	0.3202***
	(0.009)	(0.010)	(0.013)	(0.018)	(0.023)
Executive Age	-0.2894***	-0.2033***	-0.0537***	0.0870***	0.0716***
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)
Executive Tenure	0.0332***	0.0259***	0.0318***	0.0364***	0.0386***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Executive Gender	-0.1192***	-0.1079***	-0.1143***	-0.0493***	-0.0588***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Capital Adequacy	-0.0342***	-0.0342***	-0.0288***	-0.0240***	-0.0184***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Asset Quality	-0.7236***	-0.6745***	-0.6109***	-0.5996***	-0.5754***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)
Management Capabilities	0.2650***	0.1992***	0.2087***	0.1979***	0.2531***
	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Earnings	0.0323***	0.0230***	0.0315***	0.0285***	0.0319***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Liquidity	0.0035***	0.0010***	0.0024***	0.0014***	0.0032***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sensitivity	0.1957***	0.1317***	0.1382***	0.0975***	0.1541***
	(0.012)	(0.013)	(0.014)	(0.014)	(0.015)
Bank Size	0.0545***	0.0540***	0.0501***	0.0551***	0.0634***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
HH-Index	0.1941***	-0.1653**	-0.2307***	0.3806***	0.2254***
	(0.069)	(0.068)	(0.066)	(0.093)	(0.072)
Institutional Ownership	-0.0895***	-0.0684***	-0.0567***	0.0048	0.0332***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Individual Ownership	-0.0524***	-0.0078**	0.0069**	0.0028	-0.0034
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)
Public Ownership	0.1397***	0.1143***	0.1304***	0.0396***	0.0234***
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Other Ownership	0.1032***	0.0971***	0.0854***	0.0943***	0.1152***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
GDP Change	0.0113***	0.0122***	0.0733***	0.1677***	0.1353***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Interest Rate Change	-0.4124***	0.0797***	0.1775***	-0.1258***	0.4072***
	(0.011)	(0.012)	(0.013)	(0.017)	(0.018)
Market Concentration	-0.5433***	-0.7396***	-0.6644***	-0.7595***	-0.7351***
	(0.009)	(0.010)	(0.011)	(0.010)	(0.011)
Intercept	3.4933***	3.9391***	2.9875***	2.6309***	2.4735***
	(0.058)	(0.057)	(0.058)	(0.059)	(0.057)
No. of observations	97808	87704	87672	82188	80439
R2	97808	0.4237	0.4144	0.4323	0.4171

Appendix F: Results of Estimations with Interaction Terms

Table 42: The effect of executive connection on bank performance: NIITTA, interaction terms, and concentrated institutional investment

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as non-interest income to total assets ratio. Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. Interaction term 1 to 6 denote the interactions of concentrated institutional investor dummy (In order to find the concentrated institutional investor dummy, two-step calculation process is followed. In the first step, the mean of HHI is calculated in order to create the dummy variable of HHI in which if the HHI of the observation is above the mean of the HHI of the sample; it is 1, otherwise 0. In the second step, the dummy variable that comes from the first step is multiplied by the institutional ownership mean difference dummy) and CAMELS ratios mean difference variables respectively. In Column 1, current values of NIITTA are used in estimations. In Columns 2, 3, 4, and 5, NIITTA values are carried forward one quarter, two quarters, three quarters, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	0.3475***	0.2534***	0.2332***	0.1101***	0.1948***
	(0.023	(0.017)	(0.015)	(0.009)	(0.013)
Executive Age	0.0989***	0.1458***	0.0632***	0.1075***	0.0500***
	(0.006	(0.008)	(0.005)	(0.005)	(0.004)
Executive Tenure	0.0027***	0.0025***	-0.0035***	-0.0061***	0.0014**
	(0.001	(0.001)	(0.001)	(0.001)	(0.001)
Executive Gender	-0.0316***	-0.0414***	-0.0437***	-0.0369***	-0.0178***
	(0.002	(0.002)	(0.002)	(0.002)	(0.002)
Interaction Term 1	0.0198***	0.0040***	0.0022***	-0.0002	0.0029***
	(0.001	(0.001)	(0.001)	(0.001)	(0.001)
Interaction Term 2	0.0158**	-0.0663***	0.0126**	-0.0210***	-0.0075
	(0.006	(0.006)	(0.006)	(0.005)	(0.007)
Interaction Term 3	0.3341***	0.0079	-0.0097	-0.0735***	-0.1058***
	(0.022	(0.019)	(0.018)	(0.013)	(0.019)
Interaction Term 4	0.0067***	0.0047***	0.0107***	0.0054***	0.0085***
	(0.000	(0.000)	(0.000)	(0.000)	(0.001)
Interaction Term 5	0.0024***	0.0018***	0.0028***	0.0012***	0.0018***
	(0.000	(0.000)	(0.000)	(0.000)	(0.000)
Interaction Term 6	0.1476***	0.2185***	0.3462***	0.2517***	0.1637***
	(0.013	(0.010)	(0.011)	(0.013)	(0.016)
Bank Size	-0.0213***	-0.0214***	-0.0201***	-0.0272***	-0.0187***
	(0.001	(0.001)	(0.001)	(0.001)	(0.001)
HH-Index	-0.0943***	-0.0300	-0.0154	-0.1713***	-0.1608***
	(0.023	(0.031)	(0.028)	(0.022)	(0.020)
Institutional Ownership	0.0178***	-0.0089***	0.0107***	0.0117***	0.0194***
	(0.002	(0.002)	(0.001)	(0.002)	(0.002)
Individual Ownership	-0.0043**	0.0157***	0.0114***	0.0124***	0.0186***
	(0.002	(0.002)	(0.002)	(0.002)	(0.002)
Public Ownership	-0.0079***	-0.0155***	-0.0002	-0.0212***	-0.0141***
	(0.002	(0.002)	(0.002)	(0.002)	(0.002)
Other Ownership	0.0365***	0.0207***	0.0304***	0.0083***	0.0280***
	(0.001	(0.002)	(0.001)	(0.001)	(0.002)
GDP Change	0.0052***	0.0072***	-0.0073***	0.0006	-0.0075***
	(0.001	(0.001)	(0.001)	(0.001)	(0.001)
Interest Rate Change	0.0465***	0.0745***	0.0228***	0.0325***	-0.0076
	(0.006	(0.008)	(0.005)	(0.009)	(0.007)
Market Concentration	0.0134***	0.0263***	-0.0055*	0.0014	-0.0019
	(0.004	(0.004)	(0.003)	(0.003)	(0.003)
Intercept	0.1757***	-0.0416	0.4020***	0.3492***	0.3929***
	(0.022	(0.034)	(0.019)	(0.021)	(0.017)
No. of observations	57566	53427	51780	49896	48682
R2	0.1041	0.1008	0.0863	0.0761	0.0970

Table 43: The effect of executive connection on bank performance: BETA, interaction terms, and concentrated institutional investment

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as market beta (BETA). Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. Interaction term 1 to 6 denote the interactions of concentrated institutional investor dummy (In order to find the concentrated institutional investor dummy, two-step calculation process is followed. In the first step, the mean of HHI is calculated in order to create the dummy variable of HHI in which If the HHI of the observation is above the mean of the HHI of the sample, it is 1, otherwise 0. In the second step, the dummy variable that comes from the first step is multiplied by the institutional ownership mean difference dummy) and CAMELS ratios mean difference variables respectively. In Column 1, current values of BETA are used in estimations. In Columns 2, 3, 4, and 5, BETA values are carried forward one quarter, two quarters, three quarters, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	0.4751***	0.1716***	0.1346***	0.1648***	0.1590***
	(0.018	(0.013)	(0.013	(0.015)	(0.016)
Executive Age	0.7395***	0.6433***	0.6340***	0.5865***	0.5686***
	(0.011	(0.011)	(0.012	(0.012)	(0.012)
Executive Tenure	-0.0035**	0.0052***	-0.0030*	-0.0032*	-0.0063***
	(0.002	(0.002)	(0.002	(0.002)	(0.002)
Executive Gender	0.0485***	0.0069	-0.0079	0.0142***	0.0065
	(0.005	(0.005)	(0.005	(0.005)	(0.005)
Interaction Term 1	-0.0302***	-0.0444***	-0.0453***	-0.0228***	-0.0160***
	(0.002	(0.001)	(0.002	(0.002)	(0.002)
Interaction Term 2	0.2034***	0.2378***	0.2380***	0.1486***	0.2315***
	(0.014	(0.015)	(0.016	(0.017)	(0.018)
Interaction Term 3	-0.2704***	-0.1203***	-0.1483***	-0.0791**	-0.4439***
	(0.013	(0.014)	(0.016	(0.034)	(0.042)
Interaction Term 4	-0.0308***	-0.0487***	-0.0493***	-0.0559***	-0.0526***
	(0.001	(0.001)	(0.001	(0.001)	(0.002)
Interaction Term 5	-0.0188***	-0.0162***	-0.0163***	-0.0165***	-0.0188***
	(0.000	(0.000)	(0.000	(0.000)	(0.000)
Interaction Term 6	0.0211	-0.0183	0.0458	0.025	-0.1134***
	(0.030	(0.031)	(0.032	(0.035)	(0.040)
Bank Size	0.1320***	0.1370***	0.1489***	0.1400***	0.1399***
	(0.002	(0.002)	(0.002	(0.002)	(0.002)
HH-Index	1.0731***	0.9953***	1.0265***	1.0914***	0.8675***
	(0.047	(0.046)	(0.047	(0.047)	(0.049)
Institutional Ownership	0.0198***	-0.0359***	-0.0450***	-0.0343***	-0.0669***
	(0.005	(0.005)	(0.005	(0.005)	(0.005)
Individual Ownership	-0.1140***	-0.1671***	-0.2295***	-0.2255***	-0.2133***
	(0.004	(0.004)	(0.005	(0.005)	(0.005)
Public Ownership	-0.0986***	-0.1054***	-0.1185***	-0.0697***	-0.0494***
	(0.004	(0.004)	(0.004	(0.004)	(0.005)
Other Ownership	-0.0546***	-0.0751***	-0.0975***	-0.0511***	-0.0712***
	(0.005	(0.005)	(0.005	(0.005)	(0.006)
GDP Change	-0.0049*	-0.0023	0.0054*	-0.0201***	-0.0182***
	(0.003	(0.003)	(0.003	(0.003)	(0.003)
Interest Rate Change	0.1632***	0.3100***	0.1763***	0.0723***	0.2023***
	(0.015	(0.017)	(0.017	(0.020)	(0.021)
Market Concentration	0.2438***	0.4511***	0.3884***	0.5420***	0.5676***
	(0.008	(0.011)	(0.010	(0.009)	(0.008)
Intercept	-5.0812***	-5.5401***	-5.3002***	-5.6125***	-5.6026***
	(0.053	(0.062)	(0.056	(0.058)	(0.057)
No. of observations	134593	122387	122212	114819	113417
R2	0.1557	0.1674	0.1740	0.1782	0.1699

Table 44: The effect of executive connection on bank performance: Tobin's Q, interaction terms, and concentrated institutional investment

This table shows the effect of connected executive appointment and control variables on bank performance. It provides the pooled cross-sectional estimates of bank performance, measured as Tobin's Q. Robust standard errors are provided in parentheses. The period is from 2000Q1 to 2013Q4. Interaction term 1 to 6 denote the interactions of concentrated institutional investor dummy (In order to find the concentrated institutional investor dummy, two-step calculation process is followed. In the first step, the mean of HHI is calculated in order to create the dummy variable of HHI in which If the HHI of the observation is above the mean of the HHI of the sample, it is 1, otherwise 0. In the second step, the dummy variable that comes from the first step is multiplied by the institutional ownership mean difference dummy) and CAMELS ratios mean difference variables respectively. In Column 1, current values of Tobin's Q are used in estimations. In Columns 2, 3, 4, and 5, Tobin's Q values are carried forward one quarter, two quarters, three quarters, and four quarters, respectively. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Executive Connection	-0.2045***	-0.1341***	0.0263*	0.1807***	0.3278***
	(0.009)	(0.011)	(0.014)	(0.021)	(0.024)
Executive Age	-0.2994***	-0.1719***	-0.0621***	-0.0266***	-0.0415***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Executive Tenure	0.0008	0.0002	-0.0004	0.0059***	0.0017
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Executive Gender	-0.0912***	-0.0697***	-0.0733***	-0.0544***	-0.0540***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Interaction Term 1	-0.0410***	-0.0454***	-0.0321***	-0.0048***	-0.0104***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Interaction Term 2	-0.2664***	-0.2614***	-0.3008***	-0.3883***	-0.3566***
	(0.011)	(0.010)	(0.010)	(0.013)	(0.013)
Interaction Term 3	0.5807***	0.3828***	0.4478***	0.9525***	0.9750***
	(0.018)	(0.014)	(0.015)	(0.031)	(0.043)
Interaction Term 4	0.0133***	0.0053***	0.0165***	0.0201***	0.0199***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Interaction Term 5	0.0085***	0.0072***	0.0109***	0.0098***	0.0131***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Interaction Term 6	0.0221	0.1436***	0.3511***	0.5009***	0.3521***
	(0.016)	(0.017)	(0.017)	(0.021)	(0.020)
Bank Size	0.0496***	0.0394***	0.0276***	0.0351***	0.0399***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
HH-Index	0.0882*	0.1976***	0.2000***	0.3631***	0.3829***
	(0.047)	(0.047)	(0.045)	(0.044)	(0.041)
Institutional Ownership	-0.1220***	-0.0563***	-0.0174***	0.0334***	0.0933***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)
Individual Ownership	-0.0798***	-0.0353***	-0.0239***	-0.0232***	-0.0168***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Public Ownership	0.1307***	0.1057***	0.1041***	0.0192***	0.0084**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Other Ownership	0.0998***	0.0718***	0.0685***	0.0749***	0.1128***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
GDP Change	-0.0074***	0.0253***	0.1042***	0.1584***	0.1174***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Interest Rate Change	-0.4728***	-0.0771***	-0.0562***	-0.4274***	0.0574***
	(0.011)	(0.012)	(0.012)	(0.015)	(0.015)
Market Concentration	-0.9485***	-1.1145***	-1.0916***	-1.1657***	-1.1471***
	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)
Intercept	5.3701***	5.6064***	5.1351***	5.1289***	5.0411***
	(0.046)	(0.048)	(0.047)	(0.046)	(0.047)
No. of observations	139681	127090	127014	120313	116792
R2	0.2503	0.2951	0.3202	0.3508	0.3291

Appendix G: Correlation Matrix for Selected Variables

Table 45: Correlation matrix of the variables that used in estimation models

	NIITTA	BETA	Tobin's Q	Executive Connection	Executive Age	Executive Tenure	Executive Gender	Capital Adequacy	Asset Quality	Management Capabilities	Earnings	Liquidity	Sensitivity	Bank Size	HH-Index	Institutional Ownership	Individual Ownership	Public Ownership	Other Ownership	GDP Change	Interest Rate Change	Market Concentration
NIITTA	1																					
BETA	-0.05	1																				
Tobin's Q	-0.39	-0.06	1																			
Executive Connection	-0.01	-0.05	-0.20	1																		
Executive Age	-0.14	0.21	-0.06	0.12	1																	
Executive Tenure	0.12	-0.34	0.12	-0.01	-0.13	1																
Executive Gender	0.07	0.20	-0.16	0.13	0.00	-0.39	1															
Capital Adequacy	-0.14	0.03	-0.12	0.25	-0.23	0.25	0.12	1														
Asset Quality	0.29	0.02	-0.28	0.08	-0.13	0.00	-0.04	-0.11	1													
Management Capabilities	0.22	-0.24	-0.21	0.36	0.11	0.07	-0.31	-0.23	0.05	1												
Earnings	-0.10	-0.12	0.13	-0.09	-0.09	-0.15	0.10	0.19	-0.05	-0.13	1											
Liquidity	0.21	0.00	-0.26	0.00	0.16	-0.20	0.33	-0.20	0.14	-0.02	-0.05	1										
Sensitivity	0.02	0.25	-0.19	-0.07	0.33	-0.50	0.02	-0.39	0.24	-0.04	-0.16	0.22	1									
Bank Size	-0.24	-0.17	0.40	0.38	0.05	0.33	-0.10	0.32	-0.13	-0.08	0.08	-0.23	-0.42	1								
HH-Index	-0.19	0.20	0.05	-0.14	0.03	0.25	-0.15	0.24	0.05	-0.24	-0.10	0.26	-0.16	-0.08	1							
Institutional Ownership	-0.25	0.23	0.35	0.46	0.05	-0.13	0.17	0.22	-0.20	0.00	0.01	-0.04	-0.35	0.67	-0.02	1						
Individual Ownership	-0.06	-0.36	-0.20	-0.16	0.00	0.17	-0.11	0.16	0.09	-0.11	0.05	0.26	0.03	-0.18	0.59	-0.43	1					
Public Ownership	-0.15	0.19	0.16	0.41	0.30	0.12	-0.18	0.05	-0.02	0.26	-0.07	0.05	-0.12	0.47	-0.09	0.62	-0.31	1				
Other Ownership	0.03	0.33	-0.01	-0.28	-0.22	0.15	-0.03	0.17	0.14	-0.21	-0.13	0.02	0.11	-0.50	0.65	-0.41	0.34	-0.35	1			
GDP Change	0.09	-0.03	-0.13	0.16	0.09	-0.11	0.02	-0.25	-0.04	0.22	-0.08	0.36	0.09	-0.15	-0.10	0.02	-0.04	0.29	-0.17	1		
Interest Rate Change	0.38	0.08	-0.59	0.20	0.23	-0.06	-0.04	0.00	0.12	0.22	-0.10	0.51	0.33	-0.27	-0.09	-0.14	0.14	0.32	-0.13	0.37	1	
Market Concentration	-0.45	0.24	0.25	-0.19	-0.08	-0.07	-0.12	-0.06	0.11	-0.10	0.04	-0.34	-0.07	0.09	0.05	0.07	-0.19	-0.06	0.06	-0.20	-0.57	1

Paper 4

Are Powerful CEOs a Corporate Governance Problem?
Evidence from the Financial Frauds of US Banks

Abstract

The corporate governance literature has little to say about the likelihood of banks engaging in financial fraud. The commission of financial fraud by banks as partly reflecting that bank's culture, which is driven in large part by the bank's senior executives, especially the CEO. A unique dataset on financial fraud in publicly-listed US banks is employed to test for a link between fraud and CEO power. The results from probit and partially-observed bivariate probit estimations suggest that banks are more likely to commit fraud and more likely to be detected by regulators if they have powerful CEOs measured by length of CEO tenure, Chair/CEO duality, the size of the CEO's network, and if the CEO is also a part-owner of the bank. Fraud also appears more likely to be committed by large banks with relatively poor balance sheets, raising the prospect that fraud (and powerful CEOs) can have adverse systemic consequences.

1. Introduction

"Power tends to corrupt, and absolute power corrupts absolutely. Great men are almost always bad men." Attributed to Lord Action 1834-1902

The trend in enforcement actions by US bank regulators since the late 1990s suggests that banks are serious and growing offenders of financial crime.[36] This is of concern for at least two reasons. First, effective financial intermediation needs savers and investors to have confidence in the integrity of financial institutions and markets; if that confidence is damaged, saving and investment are likely to be lower than would otherwise be the case, with likely adverse consequences for the economy. Second, financial crime may weaken banks and, if the banks are especially large, there may have adverse implications for the stability of the national banking system and cross-border spillover effects.[37]

The corporate governance literature acknowledges that agency problems are particularly severe in banking and finance because the rewards to exploitation and the cost of detection can be very high, with incentive problems likely to be most severe in the largest, most complex intermediaries (e.g., Nichols et al., 2009; Zingales, 2015). However, the literature is limited to what it has to say about what is likely to determine whether a particular bank engages in financial fraud.

Several studies in the growing literature on the determinants of financial fraud link fraud to equity compensation for executives (e.g., Armstrong et al., 2010; Burns and Kedia, 2006; Efendi et al., 2007; Goldman and Slezak, 2006; Johnson et al., 2009; Peng and Röell, 2008). Other studies link fraud to corporate boards lacking independence or financial and accounting expertise (e.g., Agrawal and Chadha, 2005; Beasley, 1996; Dechow et al., 1996; Nguyen et al., 2016; Uzun et al., 2004). A number of accounting-related studies suggest that the likelihood of fraud increases if they have engaged

[36] In this study, "fraud" and "crime" words are used in the same meaning, unless stated otherwise.

[37] A case in point is Deutsche Bank with widespread press reports in September 2016 that the US Department of Justice was seeking a $14 billion civil settlement for allegedly selling toxic mortgage-backed securities; the fine was equivalent to about four-fifths of the bank's market capitalization raising doubts about the future viability of the bank and the systemic consequences should it fail (see, for example, Stewart, 2016).

previously in earnings management practices (i.e., using judgement in financial reporting to mislead stakeholders about underlying economic performance), while remaining within generally accepted accounting principles (e.g., Beneish, 1997, 1999; Jones et al., 2008; Lee et al., 1999; Perols and Lougee, 2011). Also, Li (2008) examines SEC monitoring, Dyck et al. (2010) examine monitoring by a variety of agents, and Wang et al. (2010) examine how investor beliefs affect fraud through their impact on investor monitoring and executive compensation. By contrast, this study examines how CEO power affects financial fraud emphasising the impact of powerful CEOs on a firm's culture.

The relationship between a firm's CEO and its shareholders is a classic agency theory problem (Jensen and Meckling, 1976a). CEOs may seek to maximise own interests, which might be in conflict with the interests of shareholders. This is more likely when the CEO is especially powerful since the more the decision-making discretion of CEOs, the more severe are information asymmetries between the CEO and the owners, and the greater is the likelihood of weak governance and non-value-adding decisions (Brown and Sarma, 2007). In fact, the empirical literature suggests that powerful CEOs can affect many aspects of firm performance, including by impacting adversely on financial performance (Adams et al., 2005; Veprauskaitė and Adams, 2013), increasing the likelihood of the firm engaging in earnings management (Ali and Zhang, 2015; Hu et al., 2015), driving corporate acquisitions (Brown and Sarma, 2007; Haynes and Hillman, 2010), influencing the composition of boards of directors to prevent a dilution of power maintain (Combs et al., 2007), shaping incentive contract design to their own advantage (Morse et al., 2011), and that more CEO power tends to be associated with lower credit ratings of a firm's debt (Liu and Jiraporn, 2010). The corporate governance literature suggests a variety of proxy variables to capture CEO power, which are employed in empirical estimates linking CEO power to financial fraud.

Several scholars of organisational behaviour have suggested that the origins of an organisations' culture can be found in the values and personalities of its leaders (Baron and Hannan, 2002; Deal and Kennedy, 2000; Detert et al., 2000; Schein, 1985). One implication of this is that an organisation's CEO is in a unique position to determine the culture of the firm, for example, through the questions they ask, what they pay attention

to and reward, how they respond to critical incidents. Specifically, at the level of the firm, there is considerable evidence that leadership attributes of the CEO can affect the culture of the firm (Berson et al., 2008; Giberson et al., 2009). At the same time, there is a considerable literature in criminology arguing that firms develop a normative position in response to the demands of criminal law and regulatory requirements that are either a "culture of compliance" or a "culture of resistance" (Braithwaite, 1989; Yeager, 1980) and that variations in offending rates across firms reflect variations in firm culture (Jackall, 1989). Taken together, these literature suggest the possibility that CEOs can determine a firm's culture and that that culture might incline the firm towards fraudulent activity. That being the case, the greater the power of a CEO within the firm, the more likely the CEO is to influence the firm's culture and the likelihood of it engaging in fraudulent activity. Hence, the hypothesis that the likelihood of fraudulent activities and the likelihood of detecting fraudulent activities of banks increase if they have powerful CEOs is tested.

The purpose of this paper is to add to the empirical evidence on this issue and help fill a still important gap in the literature. The corporate governance and bank behaviour literature are drawn to try to answer the question: what determines the likelihood that US banks will engage in financial fraud? The substantial corporate governance literature that ascribes a central role to the power of Chief Executive Officers (CEOs) as a determinant of many aspects of firm behaviour is drawn.

Fraud has been defined broadly as any non-violent crime that results in a financial loss (IMF, 2001). Banks can be involved in the commission of financial fraud either as perpetrators, victims or as unwilling instruments. The interest of this study is banks as perpetrators of financial fraud, which is defined quite narrowly by focusing on detected frauds as indicated by enforcements against US banks by the different bank regulatory agencies and class action litigations. We searched for data on regulatory enforcements against 960 publicly listed banks from five sources: the Board of Governors of the Federal Reserve System (FED) Enforcement Action database, the Office of the Comptroller of the Currency (OCC) Enforcement Actions database, the Federal Deposit Insurance Corporation (FDIC) Enforcement Decisions and Orders database, Stanford Law School Securities Class Action Clearinghouse (SCAC) Filings Database, and the Office of Thrift

Supervision (OTS) Enforcement Order Archive. The search uncovered 867 enforcement actions during 1998-2015 involving 340 of the banks, indicating that many of them were repeat offenders. Enforcements were on a rising trend throughout the period peaking sharply during 2007-2010, the height of the financial crises; they fell back thereafter but by the end of the period were still well above their levels of the late 1990s. Of course, the data relates only to enforcement actions and class action litigations by the regulatory authorities and courts and so do not tell whether the data reflect an increase in the rate of financial fraud or simply better detection of fraud by the regulatory authorities and courts or, more likely, some combinations of the two. Since undetected frauds are by their nature non-observable, changes in the regulatory framework are controlled that may have impacted on the effectiveness of bank regulation in econometric estimates of the determinants of financial fraud.

According to the information on the nature of the enforcement actions, fraud cases are grouped somewhat arbitrarily as 'technical' and 'non-technical' frauds. Under technical frauds, enforcement actions are grouped such as those caused by violations of requirements concerning capital adequacy and liquidity, asset quality, lending, provisions, and reserves; and under non-technical frauds, enforcement actions related to, for example, failures of internal control and audit systems, risk management systems, and anti-money laundering systems are grouped. On these definitions, the enforcement actions for non-technical frauds were more than twice as numerous as for technical frauds. The data also provides some information on the degree of repeat offending: of the 340 banks to have had enforcement actions brought against them, about half of them had faced more than one action and a quarter of them had faced at least two actions. The samples of repeated fraud cases, technical fraud cases, and non-technical fraud cases are employed for the robustness tests.

There are two limited binary variable models are employed to measure the effect of individual and whole CEO power proxy(-ies) (measured by CEO Tenure, CEO Ownership, CEO Duality, and CEO Network Size) on the likelihood of fraud and the likelihood of being detected by regulators by controlling CEO related variables (CEO Age, CEO Gender, Experience, Education), board related variables (Board Size and Board Independence), and bank-specific variables (Leverage, ROA, Liquidity, Loan

Provisions, Capital-Asset Ratio, Cost-to-Income, and Size). In partially-observed bivariate probit model, as variables of fraud signalling to regulators, Excessive Asset Growth, Abnormal ROA, Adverse Stock Dummy, Abnormal Stock Turnover, Abnormal Stock Volatility, and News Ratio are employed to measure the likelihood of detecting fraud.

The results from probit analyses with full, repeated, and non-technical samples suggest that the likelihood of finding that a bank had engaged in financial crime is greatest where CEOs are more powerful as measured CEO tenure and whether CEOs have an ownership stake in the bank. Additionally, older and experienced CEOs, who work with smaller boards in highly leveraged, less well-capitalized banks are more likely to involve into the fraudulent activities. The results from bivariate probit analyses that are constructed to employ variables in order to measure the likelihood of detecting fraud with these four samples suggest that the likelihood of being detected by a bank regulator in the US is greatest where CEOs are highly tenured, and their equity-based compensation is greater than their direct compensation (salary and bonus). The consistent story of the collective results points out experienced, less educated CEOs in highly leveraged, less well-capitalized, larger in size and board size banks increase the likelihood of detecting fraud.

The paper is organised as follows. Section 2 provides the literature on the definition of fraud, corporate fraud, and financial reporting fraud. Section 3 describes the main data sources, dataset selection & construction, and empirical methodology. The estimation & descriptive results and robustness tests are shown and discussed in Sections 4 and 5. Finally, Section 6 summarises the main findings and concludes the paper.

2. Literature Review

2.1. The nature of financial crime

Deciding on a common fraud definition has become one of the debates of the related literature while lawmakers and regulators have used the definitions that satisfy their needs

(Gilligan, 2012).[38,39] Fraud is "…an intentional act by one or more individuals among management, those charged with governance, employees, or third parties, involving the use of deception to obtain an unjust or illegal advantage" (ISA 240, 2009; p. 159). IMF provides a different approach to evolve the definition and uses the term "financial crime" that is non-violent and results with a financial loss (IMF, 2001; p. 5). According to Financial Services Authority (2004), financial fraud is an area in which it is difficult to determine the exact value and frequency of occurrence, as it is difficult to measure.

The definition of financial crime is differentiated by disciplines and expertise. The broad perspective of the definition takes the financial crime as an unlawful activity which has various consequences. On the other hand, the narrow perspective limits the definition with the only individual benefit (Freeman, 2010). Table 46 summarises different opinions of researchers on the definition of the financial crime. The common outcome of the studies that are mentioned in the related table is the unclear frame of the definition. In this context, the financial crime involves such as theft, tax evasion, bribery, identity theft as well as money laundering and financial reporting fraud in corporate level. Specifically, financial reporting fraud from these crimes involves transaction misrepresentation, accounting principles restatement, misapplication of accounting standards, accounting records distortion, and money laundering.

Despite the different labels such as white-collar crime, corporate illegal behaviour, management fraud, and managerial vice are used to point out the same meaning of fraud, the common point is term 'wrongdoing' in various disciplines such as criminology, psychology, economics, law, accounting, and management. Another common point of the wrongdoing is the nature of non-violence; the reason of white-collar crime is the strong financial motivation against the organisation or society.

Clinard and Quinney (1973) classify the white-collar crime in several ways. The occupational crime that includes embezzlement or padding expense reports is the wrongdoing of individuals against a firm for the benefit of himself/herself. The corporate crime that includes bribery or manipulation of environmental reports is the wrongdoing

[38] The theoretical background and detailed discussion are provided in Appendix B.
[39] Legal framework of fraud in the US is discussed in Appendix C.

of individuals on behalf of a firm. The main purpose of an individual is to help a firm, and the potential motivation of corporate crime of an individual is to gain from the indirect benefits of the wrongdoing.

Table 46: Definitions of financial fraud.

Author(s)	Definition
Alexander and Cohen (1996)	Corporate fraud is related to firms that perform worse than competitors and are more likely to initiate criminal conduct when an employee or manager decides to use an unlawful practice.
Pickett and Pickett (2002)	Financial fraud term is much likely associated with the concept of crime, and there is no common definition.
Pusey (2007)	Financial fraud term often refers to money laundering, financing of terrorist activities, tax evasion, and serious crimes with elements of fraud, dishonesty, corruption from persons who drive unlawful financial benefits.
Fletcher (2007)	Financial fraud is a very broad subject and includes unlawful activities such as money laundering, terrorist activity financing and financial fraud.
Henning (2009)	Financial fraud is a broad term that includes money laundering, corruption, bribery, embezzlement, insider trading, tax violations, cyber-attacks, etc.
Hansen (2009)	Financial fraud has been referred to as a crime without victims and sometimes it is impossible to identify who has suffered from a financial loss.
Gottschalk (2010)	Financial fraud is to involve into the unlawful activities and often defined as crime against property rights.
Gillian (2012)	Financial crime definition suffers from uncertainty. It is used as a category of crime.
Davidson (2015)	Financial crime is defined as a crime, which has potential unfairness against the defendant, potentially simplified complex issues, and delayed court decisions.

Source: Author's own

White-collar crime is also classified according to the attendance of individuals. Daboub et al. (1995) use the terms 'active participation' that denotes the active participations of the individual into the illegal activities and 'passive acquiescence' that refer to the managers, who are aware of the wrongdoing but do not take corrective actions. In addition to these two different form of participations, Lee Hamilton and Sanders (1999) provide two more dimensions that indicate a dilemma of a wrongdoing participant: 'crimes of obedience' and 'second face of evil'. Crimes of obedience refer to the dilemma of an individual who can follow the order that causes a wrongdoing or disobey the rules. Moreover, the second face of evil refers to an individual who only follows the firm routine and causes a wrongdoing.

2.2. Corporate fraud and detection process

The large fraud cases from all over the world in the early 2000s have increased the concerns on corporate governance mechanisms and their effectiveness. The emerging literature on corporate fraud discusses the factors that increase the likelihood of fraud, the detection of fraud, and the consequences of fraud such as increased financial market instability, misallocation of capital, decreased shareholder value and damaged investor confidence (Yu, 2013).

Karpoff and Lott (1993) advocate that the formal court imposed sanctions are only small parts of the damage that is caused by fraud committing. The effect of committing fraud is not limited to the firm-specific cases; it has a significant effect on public. They also mention that the severe damage of corporate fraud is not related to fines. The reputational effect of corporate fraud is greater and more severe. In order to find out the reputational losses of corporate fraud, they employ Wall Street Journal Index for the period of 1981 and 1987. By estimation the abnormal stock market returns and dollar amount of losses, they show the wealth loss, which is related to reputational loss and greater than the dollar amount of fines.

In a similar vein, Beatty et al. (1998) investigate the indirect effect of SEC investigations on initial public offering (IPO) underwriters and their past clients. They mention that the economic effect of the SEC investigation is not limited to the case of underwriter's IPO. The effect is broadened by economic losses of clients, who face the indirect penalties in the markets. By employing the dataset that covers 29 SEC investigation cases between 1980 and 1993, they focus on the mean and median differences in IPO pricing before and after the investigation. The results show that the underwriter's loss is at least 50 percent of IPO market shares. In addition to the decline in market share, the underwriters also face with increased regulatory scrutiny that reduces the opportunity for market timing. Moreover, the investigation also increases the uncertainty of management's proposed disclosures. In the market, the SEC investigation increases perceived information asymmetry, and past clients of the investigated IPO suffer from the more volatile daily stock after the announcement of SEC investigation.

By focusing on the lawsuits, Bhagat et al. (1998) investigate the effect of a corporate lawsuit against a firm and measure the wealth loss of the defendant. They use a sample of corporate lawsuits for more than 200 cases between 1981 and 1983. Without differentiating the identity of the plaintiff, they document a 0.97 percent market value loss of the defendant firm. The market value loss increases to 1.73 percent if the plaintiff is a government organisation. They mention that the possible explanation of this increase is related to the lawsuit-related experience of a government organisation, which has relatively more resources and leverage to a lawsuit battle. The results also mention that government organisations pay much more attention of the environmental lawsuits; the market value loss of the defendant increases to 3.08 percent while the loss is 2.71 percent and 0.81 percent at security law violation lawsuits and antitrust lawsuits, respectively. Another important finding is related to the size of the defendant; relatively larger defendant firms face less market value losses in which they may have more resources and incentive to defend themselves.

In a specific industry example, Karpoff et al. (1999) point out the effect of firm size on the negative stock return after the investigation of fraud, indictments, and suspensions of firms. By analysing cumulative abnormal returns of a sample that consist of 249 separate fraud cases from Department of Defence's Inspector General's Office between 1983 to 1995, they detect that the negative abnormal stock return for top 100 defence firms is less than for the unranked contractors in defence industry; the measured negative abnormal stock return of the top 100 defence firms is 0.4 percent while it is 6.31 percent for the unranked contractors. This result is consistent with the influential contractor hypothesis that advocates the transfer of wealth to top defence contractors by imposing primarily large penalties on unranked contractors.

In a theoretical study, by covering all potential legal and illegal actions of managers, Bar-Gill and Bebchuk (2002) model the misreporting of corporate performance. The main purpose of this modelling is to detect misreporting that allow low-value firm managers to mimic the reports made by high-value firm managers. They point out that the managers who are not able to sell their firm's shares in the short run are eager to misreport to provide enough time to raise capital. This behaviour creates negative externality and increases the

economic cost of investments. The illegal actions that are subject to the investigations of corporate fraud increase in the lack of regulatory environment.

In the second half of the 2000s, Karpoff et al. (2008a, 2008b) extended the literature by investigating the effect of corporate fraud on firms and individuals and provided support for Karpoff and Lott's (1993) empirical findings by employing a large and up-to-date sample. In Karpoff et al.'s (2008a) study, 585 SEC enforcement actions that cover administrative, civil, and criminal penalties against all SEC-regulated firms between 1978 and 2002 are employed to measure the wealth losses of firms. The assumption they use is the large effect of corporate fraud on public policy if financial misconduct is punished lightly without considering the effects on the market. 231 of these 585 SEC enforcement actions results with fines and civil settlement; some of these 231 cases also relatively large dollar fines. On the other hand, the market reaction to these enforcement actions is immense compared to dollar amounts of fines and civil settlements. In given period, the average loss of firm value, which denotes the decline in the present value of cash flows, is 38 percent after the announcement of misconduct. 24.5 percent of this loss is the market reaction to the need of accurate representation of the financial situations of the investigated firms. 8.8 percent of the loss is the result of the expectation of the penalties that include the fines and civil settlements. The majority of the loss (66 percent) is the result of reputational problems of the firms, and this is in line with Karpoff and Lott's (1993) findings.

In addition to the study that shows the reputational effect of corporate fraud on firms, by employing a sample that covers a similar period, Karpoff et al. (2008b) investigate the reputational effect of corporate fraud on individuals. For the period of 1978 and 2006, there are 788 SEC and Department of Justice (DOJ) enforcement actions against individuals identified in the sample. The empirical results point out that 93 percent of the individuals who are the subject of the enforcement actions lose their jobs at the end of the period of regulatory enforcement investigations. The common reason of the job loss is being fired and the likelihood of being fired increases according to the severity of the corporate fraud. The relatively small fraction of these individuals faces a criminal charge.

By focusing on the lawsuits rather than enforcement actions, Gande and Lewis (2009) provide the evidence of the negative stock price reactions to shareholder related class action litigations. In the US, one of the most important reasons of the corporate scandals is the fraudulent activities related to alleged securities that represent any wrongdoings of material misstatement. In order to detect alleged securities-related frauds, regulatory enforcement actions or private litigation actions are needed. As a special form of private litigation action, class action litigations are essential factors on corporate governance and shareholder rights. In this study, Gande and Lewis (2009) employ a sample of 1915 class action litigations between 1996 and 2003 from Securities Class Action Clearinghouse (SCAC) database. One of the findings of this study is the pre-litigation wealth losses of shareholders; at least one of the plaintiffs who represent the shareholders has a capital loss before the litigation. In addition to the pre-litigation wealth losses, shareholders face up to 35 percent loss in the value of their shares. Moreover, the results also point out that the wealth loss of shareholders of firms with a higher likelihood of being sued is significantly higher.

Rather than enforcement actions or class action litigations, Murphy et al. (2009) employ a sample of an allegation of corporate fraud and measure the effect of these allegations on offender firm profitability and risk. The reported earnings and analyst's earnings forecasts are the profitability measures; stock return volatility and concordance among analyst's forecasts are the risk measures used in the study. The sample is constructed by searching keywords such as antitrust, bribery, business ethics, securities fraud, and white-collar crime in Wall Street Journal Index for the period of 1982 and 1996; there are 392 cases (175 related party cases and 217 third party cases) in the sample. The results indicate that average abnormal stock price return is negative after the announcement of the allegation of a corporate fraud case in a four-year window. The magnitude of the negative average abnormal stock return increases if the allegation is related to the related parties of the offender compared to cases of third party allegation corporate fraud cases. The results for the risk measures are in the similar vein; the significance level of the change in risk measures after the announcement is changed according to the nature of the variable.

By focusing on the belief in the market, Wang et al. (2010) conduct the research to explore the factors that affect the committing fraud. The sample consists of 423 from SEC's Accounting and Auditing Enforcement Releases dataset and 1,085 private class action litigation cases from SCAC in which 212 of them are in both datasets for the period of 1995 and 2005. The empirical results show that the likelihood of fraud in firms increases when the belief level of investors is moderate in the market. On the other hand, the likelihood of fraud declines if the investors have a strong belief in the market. In this condition, monitoring by investors and short-term executive compensation transmit the belief in the market into the likelihood of fraud within the firm. By setting up a similar methodology of Wang et al.'s (2010) work, Khanna et al. (2015) explore the effect of CEO networking on the risk of corporate fraud by employing a sample of 371 fraud cases from FSR database between 1996 and 2006. They point out that the CEO connection that is originated from the appointment of the CEO declines the likelihood of committing fraud. By concealing the effects of corporate fraud, the CEO connection declines the potential costs of fraud. Moreover, it declines the probability of CEO dismissal upon detecting corporate fraud. On the other hand, the CEO connection that is originated from the previous appointments, social ties at any capacity, and same educational institutions has an insignificant effect on the likelihood of fraud.

By collecting regulatory enforcement actions in the US banking system, Nguyen et al. (2016) conduct the research that aims to decide whether the board functions can prevent misconduct in banks and find out the effect of monitoring and advising quality of bank boards on the likelihood of fraud. By covering a sample of 244 enforcement actions against banks from 2000 to 2013, they employ similar methodology with Wang et al. (2010) and Khanna et al. (2015) to differentiate the likelihood of fraud and likelihood of committing fraud. They also differentiate their sample by using the nature of the enforcement actions. They find out that board monitoring helps to detect bank fraud by regulators and increases the penalties of the CEO, who is one of the subjects of the enforcement action. They assess the positive effect of board advising on preventing bank fraud in technical cases that are mentioned as cases related to manipulation of financial reports.

One of the measures of corporate governance effectiveness is detecting fraud in time. Following the red flags and other clues are the common methods to detect the fraud. With this purpose, there are some red flags defined in the accounting literature (Beneish, 1999; Dechow et al., 2011). Beneish lists that the accounting variables such as asset quality, gross margin, leverage, sales growth, and depreciation may be the indicators of fraud detection. On the other hand, merger & acquisition transactions that restricted by the regulators in order to create fair market environment for the entities in the market, capital and R&D expenditures that signal the structural change of the enterprises, and fluctuations in stock market and operating performance are other red flags and clues that may be used in order to detect fraud (Wang, 2013). On the other hand, the findings of Dimmock and Gerken's (2012) work point out that the past regulatory violations and conflicts of interest are the factors that affect the predictability of fraud. Disclosed business practices of investment firms are the red flags of fraud that is needed to be investigated. Bollen and Pool (2012) argue that the suspicious return patterns of mutual, pension and hedge funds can be employed as fraud indicators. By using the SEC administrative proceeding and litigation releases of investment firms between 2001 and 2010, they empirically provide evidence on the performance flags of hedge funds as indicators of fraudulent activities.

In addition to the indicators that are used as red flags of fraudulent activities, the literature discusses that of who responsible for detecting fraud. The classical view takes the legal, regulatory organisations in charge (Yu and Yu, 2011). Francis (2004) points out the role of auditors' role in deterring and detecting fraudulent activities. In addition to the auditors, institutional investors, who have a higher incentive to gather accurate information (Chung et al., 2002) and financial analysts (Yu, 2008) are essential in detecting fraudulent activities. Nevertheless other components of the business are also essential in detecting fraud. Dyck et al. (2010) show that employees, media, and non-financial industry regulators are more essential in fraud detection rather than financial market regulators, investors, auditors, and lawyers.

2.3. Financial Reporting Fraud as a special form of corporate fraud

Accounting irregularities and their reporting are special forms of corporate crime. The literature that investigates financial reporting fraud lies on the similar theoretical background as other forms of the corporate crime.[40]

Due to the developments in the internet and communication technologies, there has been a dramatic increase in fraudulent schemes link with all sides in the business (Bolton and Hand, 2002) and evolved (Green and Reinstein, 2004). Furthermore, the dramatic collapses of huge corporations such as WorldCom, Enron, and Global Crossing were due to incidences of financial reporting fraud. These fraud cases had eroded confidence towards the financial markets (Law, 2011). Thus, financial reporting fraud can lead not only to significant risks for shareholders and other financial information users but also to financial crises for the financial markets.

Prior research shows that allegations of financial fraud result in significant penalties in the form of loss in the value of the firm's equity (Murphy et al., 2009). Broadly, directors of firms who are the subject of fraudulent activities pose an essential issue in the global financial markets; such behaviour misleads the financial information users. Fraud by executives has a devastating effect on a firm's shareholders and employees; it can ruin a firm's reputation and credibility. Thus, they do so to prevent a decrease in share price (Pai et al., 2011; Rezaee, 2005). Moreover, if the public loses trust in the firm and its management, firm's continuity for financial information user can become doubtful. As a consequence manipulated financial statements can damage corporate legality at a certain level in which illegal corporate activities take place not only because of the board of director characteristics but also individual misconduct in the context of corporate governance (Daboub et al., 1995).

Prior studies examine the relationship between corporate governance mechanisms and either earning management or enforcement actions of regulators for the violation of accounting regulations such as Generally Accepted Accounting Principles (GAAP).

[40] Appendix A, Table 56 provides summaries of the examples of the research that studies accounting irregularities as corporate crime and financial fraud.

Agrawal and Chadha (2005) extend the literature on the relationship between corporate governance and Securities Exchange Commission (SEC) enforcement actions and GAAP violations. Specifically, Dechow et al. (1996), for example, examine firms subject to accounting enforcement actions by SEC for GAAP and finding no evidence executives manipulate earnings for personal gain. Beasley (1996) investigates the link between the board of director composition and financial reporting fraud by examining the effect of misreporting on outside board member appointment. On the other hand, Burns and Kedia (2008) examine the executive exercises and financial misreporting. Also, Bolton et al. (2006) show that not only executives but also shareholders can even benefit from misreporting.

Several prior studies that examine the importance of auditing to prevent financial crime are explained in the accounting literature (Abbott et al., 2010; Caplan, 1999; Messier, Jr. et al., 2011; Norman et al., 2010). In addition to the theoretical framework that discusses the potential benefits of preventing financial crime function of auditing, recent accounting scandals have increased the role of external and internal auditing on financial reporting. Specifically, the internal audit function is defined as a critical tool to deliver the reliability of the financial reporting process and the prevention of fraud (Glover et al., 2008; Harshbarger and Jois, 2007; Prawitt et al., 2009). Consistent with some prior research, Law (2011) finds that audit committee effectiveness is positively associated with the absence of fraud in business. Similarly, Salterio (2008) find that integrated audits are effective at decreasing management fraud. Likewise, Jans et al. (2010) discuss that the use of a descriptive data mining approach rather than a predictive data mining approach to reduce the risk of internal fraud in a firm. On the other hand, other research suggests that no evidence find even though the presence of an audit committee reduce financial reporting fraud (Beasley, 1996). Similarly, by using a sample 409 firms that are subjects to SEC lawsuits in the period of 1997 and 2001, Srinivasan (2005) finds no evidence of a penalty for board directors or audit committee members after the detection of the financial fraud.

Following prior research, Zhou and Kapoor (2011) argue the definition of the financial reporting fraud that includes manipulation of financial records, transactions, and accounts, significant information change in financial statements, and misapplication of

accounting principles, policies, and procedures used to measure, recognize, and report the financial structures and conditions of firms. Black (2005) suggests that because of misleading fraudulent activities have potential to produce real profits for schemer. Thus, misleading financial reporting can result in over-priced securities and over-borrowing by a firm. For this reason, enforcing accounting rules and preventing fraud are critically important in sustaining a viable financial system (Sadka, 2006). This evidence suggests that misleading financial statements can damage firms and its stockholders. In the case of misleading financial statements, falsifications and manipulations of balance sheets, may lead the loss of trust in capital markets that must be restored through criminal law (Hefendehl, 2004).

The results of empirical studies are mixed; some studies examine the role of costly performance manipulation (e.g., Crocker and Slemrod, 2007; Dutta and Gigler, 2002; Liang, 2004; Maggi and Rodríguez-Clare, 1995). Whereas some studies examine that holdings can provide incentives for managers in order to misstate accounting numbers and evidence a statistically significant connection (Bergstresser and Philippon, 2006; Efendi et al., 2007; Harris and Bromiley, 2007), and find negative and significant relationship (Armstrong et al., 2010; Baber et al., 2006; Erickson et al., 2006). On the contrary, few studies show that equity incentives can instead lessen management's desire to manipulate accounting numbers (Burns and Kedia, 2006; O'Connor et al., 2006).

In the literature, studies provide mixed results on manipulative accounting information and equity incentives of executives. By using the income restatement cases, Core (2010) finds no relationship between incentives and accounting irregularities. Harris and Bromiley (2007) find a positive association between the incidences of restatements and the ratio of a stock option to total compensation, while O'Connor et al. (2006), Baber et al. (2009), and Jayaraman and Milbourn (2014) do not find a similar statistical association. Similarly, Warren et al. (2011) find that CEO's stock option compensation motivates the CEO to commit corporate earning fraud. Also, Johnson et al. (2009) find that governance and CEO characteristics and the likelihood of corporate fraud are positively related to incentives from unrestricted stockholdings. Therefore, Efendi et al. (2007) discuss the value of the CEO's option holdings affect not only the likelihood of a misstatement but also the likelihood of a severe accounting irregularity.

3. Methodology and Data

3.1. Data selection process

In order to construct a panel dataset, enforcement action and class action litigation databases, BoardEx, Bloomberg, FED call reports and SNL Financial databases are used. Enforcement action and class action litigation databases are employed to pull out the dataset of fraud cases. The detailed corporate governance-related information such as CEO tenure, CEO duality, CEO network size, board size, and board independence are gathered from BoardEx. The market information of listed banks that consists of daily stock price and number of shares outstanding is collected from Bloomberg. FED call reports and SNL Financial that is constructed by using the required company filings are employed to provide bank level information such as leverage, liquidity, capital structure, and size.

First of all, raw data of fraud cases that consist of documents of enforcement action and class action litigation (from now on referred to as fraud cases) is compiled from the related web-based data sources. These data sources are the Board of Governors of the Federal Reserve System (FED) Enforcement Action database, the Office of the Comptroller of the Currency (OCC) Enforcement Actions database, the Federal Deposit Insurance Corporation (FDIC) Enforcement Decisions and Orders database, Stanford Law School Securities Class Action Clearinghouse (SCAC) Filings Database, the Office of Thrift Supervision (OTS) Enforcement Order Archive.[41] OTS Enforcement Order Archive provides historical listing of OTS enforcement actions that covers firm details and related documents against federally chartered savings associations and thrift companies and is dated between 13/01/1999 and 21/07/2011.[42]

[41] The related acts of regulators, organizational structure, and enforcement action performances of FED, FDIC, and OCC are discussed in Paper 1.

[42] The OTS database is employed in order to provide consistency in the dataset. At the end of 1990s, deregulation process of the US banking system has been started by eliminating the separation of commercial and investment banks. In this year, bank holding companies were allowed to conduct in businesses in finance sector without any restrictions.

SCAC provides federal class action securities fraud litigation related information by covering prosecution, defence, and settlement. After the pass of Private Securities Litigation Reform Act of 1995, the database provides the copies of related materials of more than 4000 securities class action lawsuits. SCAC organises the database by gathering the filings from the Public Access to Court Electronic Records database. As of 1st of March 2017, the dollar amount of all settlements is more than $85 billion. Total number of defendants that consist of individuals and companies sued is more than 31,000. The number of Filings settled is 2,168; the number of Filings dismissed is 1,715; the number of Filings still ongoing is 528. The most active District Court is S.D. New York. The most frequently sued sector is Technology and exchange of most frequently sued issuers is NASDAQ ("Securities Class Action Clearinghouse: Filings Database," n.d.).

Table 47 provides the number of fraud cases between 01/01/1998 and 31/12/2015. Despite the fact that individuals who are the board members, executives, shareholders, or stakeholders of banks at any capacity can also be investigated by the regulators or may be the defendants of any class action litigations, only enforcement actions and class action litigations of institutions are taken into consideration. By following the SCAC data construction style of Brochet and Srinivasan's (2014) work, fraud cases in the banking industry are taken; class action litigations of firms from other industries are excluded from SCAC dataset.

In total, there are 11,241 fraud cases in given period. The FDIC is responsible for promoting the public confidence in the US financial system by insuring the deposits at a specified level. In order to complete this mission, the FDIC monitors the banking system by examining more 5,500 insured institutions for compliance with consumer protection laws; state nonmember banks, state savings banks, and state savings association are primarily regulated by the FDIC. This explains why the fraud cases from the FDIC is 54.9 percent of all cases. One of the main functions of the FED is to promote the safety and soundness of individual financial institutions. At the federal level, the FED is the primary regulator of state member banks, foreign bank uninsured state branches and agencies, foreign bank commercial chartered lending firms, foreign bank edge corporations, foreign bank agreement corporations, and foreign bank representative offices. 14.1 percent of all fraud cases between 1998 and 2015 is from the FED. The OCC supervises, regulates, and

charters all national banks, federal savings associations, federal savings banks and foreign bank uninsured federal branches and agencies. 14.2 percent of all fraud cases is from the OCC. In given period, 10.5 percent and 6.3 percent of fraud cases from the OTS and the SCAC, respectively.

Table 47: The number of fraud cases over the period of 1998-2015.

Year	FED	OCC	FDIC	OTS	SCAC	Total
1998	24	51	124	50	20	269
1999	43	53	151	52	24	323
2000	37	50	105	51	28	271
2001	20	59	155	41	27	302
2002	23	71	155	31	70	350
2003	54	68	182	15	64	383
2004	38	58	252	82	51	481
2005	61	74	204	66	32	437
2006	28	53	227	56	16	380
2007	34	41	219	50	42	386
2008	89	108	319	81	114	711
2009	264	190	621	223	76	1374
2010	309	236	882	224	44	1695
2011	172	138	757	159	23	1249
2012	127	133	640		17	917
2013	98	92	484		20	694
2014	75	63	386		25	549
2015	86	61	305		18	470
Total	1582	1599	6168	1181	711	11241

Sources: Board of Governors of the Federal Reserve System (FED) Enforcement Action database (https://www.federalreserve.gov/apps/enforcementactions/search.aspx), the Office of the Comptroller of the Currency (OCC) Enforcement Actions database (http://apps.occ.gov/EASearch/), the Federal Deposit Insurance Corporation (FDIC) Enforcement Decisions and Orders database (https://www5.fdic.gov/edo/DataPresentation.html), Stanford Law School Securities Class Action Clearinghouse (SCAC) Filings Database (http://securities.stanford.edu/filings.html), the Office of Thrift Supervision (OTS) Enforcement Order Archive (https://www.occ.treas.gov/static/ots/enforcement/ots-enforcement-order-listing.xlsx).

In the second step, the list publicly-listed US banks is used to exclude the banks in 11,241 cases that are not matched.[43] Increased transparency brought by being listed allows banks to penetrate capital markets easily (Flannery and Sorescu, 1996). The logic behind selecting publicly-listed US banks is related to the greater market size of listed banks, additional information disclosure regulations by Securities Exchanges Commissions (SEC), and information availability of listed banks. Banks, which are the subject of fraud are matched with the list by using unique RSSD IDs and ISINs.

[43] The list is gathered from SNL financial and contains listed banks as of 31st of December 2015. In order to provide a complete list of publicly-listed banks, delisted banks are also added.

For this sample, 867 fraud cases during 1996-2015 involving 340 of the banks, indicating that some of them were repeat offenders.[44] There is no fraud case detected for the rest of the 620 banks that is the control group of the sample.

Table 48, Panel A provides the number and time distribution of fraud cases in matched sample. Different than the percentage of the FDIC fraud cases in 11,241 cases, 15.8 percent of cases in matched sample is from the FDIC. The potential reason for this change is related to the regulatory responsibility of the FDIC that covers small and private banks. Nonetheless BoardEx collects the information of publicly-listed banks. On the other hand, the percentage of the OCC fraud cases is 29.1 percent in matched sample; it shows an increase in percentage of the OCC fraud cases in total. One of the possible reasons for this increase is the regulation of national banks by the OCC. There are also increases the percentage of the FED and SCAC fraud cases; 26.3 percent and 20.9 percent of cases in matched sample are from the FED and SCAC, respectively. 7.8 percent of the cases are from the OTS. Table 48, Panel B provides some information on the degree of repeat offending: of the 340 banks to have had fraud cases brought against them, about half of them had faced more than one action and a quarter of them had faced at least two actions.

In order to demonstrate fraud cases, the detailed enforcement action and class action litigation documents are manually reviewed. Fraud cases vary widely; the individuals who involved, the instruments and documents that are affected by the presence of the fraud, and the market-level and firm-level segments in which they are accomplished examples of the factors that affect the nature and classification of fraud. The fraud cases are classified according to the reasons of investigation and litigation. There are eight groups of investigation and litigation reasons defined. These groups are (i) false and misleading financial statement, (ii) loan loss reserve failure (e.g. practices in mortgage loan services), (iii) material omission, misstatement, misrepresentation, incompliance, and reclassification, (iv) unsafe and unsound banking practices (e.g. reduces asset quality, higher credit risk, liquidity issues, etc.), (v) information disclosure failure (fraud cases related to IPO, M&A, and hedge fund transactions), (vi) managerial misconduct (e.g.

[44] The list of fraud sample banks with the latest annual report date and total assets is provided in Table 57, Appendix D.

failure of policy implications & ordinary transactions, violation of common law, and insufficient internal control), (vii) money laundering, and (viii) related party transaction failure (e.g. customer complaints).

Table 48: The number of fraud cases and banks in the sample over the period of 1998–2015.

Panel A: Time distribution of fraud cases						
Year	FED	OCC	FDIC	OTS	SCAC	Total
1998	1				3	4
1999					2	2
2000	4	2	1	7	1	15
2001		2		3	2	7
2002	3	6	1		22	32
2003	11	5	2	3	15	36
2004	9	4	2	2	14	31
2005	9	14	2	6	5	36
2006	4	7	6	3	1	21
2007	7	7	1	3	9	27
2008	10	14	13	3	40	80
2009	39	23	18	12	23	115
2010	51	33	27	13	19	143
2011	28	23	22	13	8	94
2012	16	21	22		8	67
2013	11	32	7		5	55
2014	7	28	7		5	47
2015	18	31	6			55
Total	228	252	137	68	182	867

Panel B: Number of banks by repeated fraud					
	One fraud	More than once	More than twice	More than three	Total
Number of bank	40	166	87	47	340

Sources: Board of Governors of the Federal Reserve System (FED) Enforcement Action database (https://www.federalreserve.gov/apps/enforcementactions/search.aspx), the Office of the Comptroller of the Currency (OCC) Enforcement Actions database (http://apps.occ.gov/EASearch/), the Federal Deposit Insurance Corporation (FDIC) Enforcement Decisions and Orders database (https://www5.fdic.gov/edo/DataPresentation.html), Stanford Law School Securities Class Action Clearinghouse (SCAC) Filings Database (http://securities.stanford.edu/filings.html), the Office of Thrift Supervision (OTS) Enforcement Order Archive (https://www.occ.treas.gov/static/ots/enforcement/ots-enforcement-order-listing.xlsx) (the RSSD ID and ISIN matched sample of banks by using the list publicly-listed US banks).

Table 49 shows the fraud classification and distribution of fraud classes among regulators and class action litigations. 21.6 percent of the fraud cases are associated with the unsafe and unsound banking practices, while 19.3 percent of the fraud cases for managerial misconduct. 15.6 percent of the fraud cases are related to the false and misleading financial statement. Loan loss reserve failure and related party transaction failure are the reasons of the investigations of regulators with 10.1 percent and 10.4 percent,

respectively. 9.6 percent, 7.7 percent, and 5.8 percent of the fraud cases are linked to money laundering, information disclosure failure, and material omission, misstatement, misrepresentation, incompliance and reclassification, respectively.

Despite regulating the similar financial firms and having closer responsibilities, the distribution of fraud cases according to the fraud classification provides consistent results with the specific functions and responsibilities of the regulators on duty as of 31st of December 2015. 46.1 percent of the FED fraud cases are related to unsafe and unsound banking practice, and this result is consistent with the function of promoting safety and soundness of individual financial institutions of the Federal Reserve System. On the other hand, 36.1 percent of the OCC fraud cases are linked to managerial misconduct, which violates the chartering function of the OCC with the objective of improving efficiency and effectiveness of OCC supervision. Moreover, 42.3 percent of the FDIC fraud cases is associated with loan loss reserve failure. By insuring deposits in banks, the FDIC takes the main responsibility of investigating the loan structure of banks. In addition to the functions and responsibilities of the regulators, SCAC fraud cases also provide consistent result in terms of distribution. A class action litigation is a device that allows one or more plaintiffs to file a lawsuit on behalf of a larger group; the plaintiffs of class action litigations related to securities are shareholders (Park, 2013). The common reason for filing a lawsuit is related financial statements that are used by the shareholders to be informed about the financial condition of the firm. Under these conditions, 73.1 percent of SCAC fraud cases are related to false and misleading financial statements.

By following Nyugen et al. (2016), the fraud cases are classified according to how technical the underlying fraud is. The technical fraud cases are related to violation of regulations on capital and asset structures, defined liquidity, lending, and reserve requirements of banks. The non-technical fraud cases are linked to violation of any consumer compliance programs and regulations of bank management that cover the roles, duties, and structures of the executive team and board of directors. In this format, loans loss reserve failure and unsafe and unsound banking practice related frauds are classified as technical frauds. On the other hand, the rest of the fraud classes defined above is classified as non-technical fraud.

Table 49: Fraud classification and the number of fraud cases over the period of 1998–2015.

Fraud Classification	FED	OCC	FDIC	OTS	SCAC	Total
False and misleading financial statement	1			1	133	135
Loan loss reserve failure	21	8	58	1		88
Material omission, misstatement, misrepresentation, incompliance and reclassification	19	20	2	3	6	50
Unsafe and unsound banking practice	105	35	24	19	4	187
Information disclosure failure	8	16	1	5	37	67
Managerial misconduct	15	91	37	23	1	167
Money laundering	30	25	13	14	1	83
Related party transaction failure	29	57	2	2		90
Total	228	252	137	68	182	867

Sources: Author's calculation, Board of Governors of the Federal Reserve System (FED) Enforcement Action database (https://www.federalreserve.gov/apps/enforcementactions/search.aspx), the Office of the Comptroller of the Currency (OCC) Enforcement Actions database (http://apps.occ.gov/EASearch/), the Federal Deposit Insurance Corporation (FDIC) Enforcement Decisions and Orders database (https://www5.fdic.gov/edo/DataPresentation.html), Stanford Law School Securities Class Action Clearinghouse (SCAC) Filings Database (http://securities.stanford.edu/filings.html), the Office of Thrift Supervision (OTS) Enforcement Order Archive (https://www.occ.treas.gov/static/ots/enforcement/ots-enforcement-order-listing.xlsx) (the RSSD ID and ISIN matched sample of banks by using the list publicly-listed US banks).

Table 50 provides the number of technical and non-technical frauds and their distribution on regulators. 275 of the fraud cases are classified as technical fraud. In addition to the FDIC related 82 technical fraud cases, 126 of the technical fraud cases are the FED fraud cases. This is consistent with the regulatory functions and responsibilities of the FED and the FDIC. The total number of non-technical fraud cases is 592; 209 of them are the OCC fraud cases. Moreover, 178 of the non-technical fraud cases are SCAC fraud cases in the sample.

Table 50: Fraud type and the number of fraud cases over the period of 1998–2015.

Fraud Type	FED	OCC	FDIC	OTS	SCAC	Total
Technical fraud	126	43	82	20	4	275
Non-technical fraud	102	209	55	48	178	592
Total	228	252	137	68	182	867

Sources: Author's calculation following Nyugen et al. (2016), Board of Governors of the FED Enforcement Action database (https://www.federalreserve.gov/apps/enforcementactions/search.aspx), the Office of the Comptroller of the Currency (OCC) Enforcement Actions database (http://apps.occ.gov/EASearch/), the Federal Deposit Insurance Corporation (FDIC) Enforcement Decisions and Orders database (https://www5.fdic.gov/edo/DataPresentation.html), Stanford Law School SCAC Filings Database (http://securities.stanford.edu/filings.html), the Office of Thrift Supervision (OTS) Enforcement Order Archive (https://www.occ.treas.gov/static/ots/enforcement/ots-enforcement-order-listing.xlsx) (the RSSD ID and ISIN matched sample of banks by using the list publicly-listed US banks).

There are nine enforcement actions that are assigned by the regulators: assessment of civil money penalty, cease and desist order, written agreement, orders of removal/prohibition, consent order, prompt corrective action, supervisory agreement, notice field, and capital directive.[45] Table 51 shows the distribution of fraud cases according to enforcement action types and regulators. 255 enforcement actions are civil money penalties in 867 fraud cases. In addition to the civil money penalties, there are two more fraud cases that are greater than 100 enforcement actions of cease and desist order and written agreement.

Table 51: Enforcement action types ordered by the FED, OCC, FDIC, OTS, and class action litigations from SCAC.

Enforcement Action Type	FED	OCC	FDIC	OTS	SCAC	Total
Civil money penalty	67	83	93	12		255
Cease and desist order	26	161	18	18		223
Class action litigation					182	182
Written agreement	128					128
Orders of removal / prohibition				28		28
Consent order			25			25
Prompt corrective action	7	2	1	3		13
Supervisory agreement				7		
Notice filed		3				
Capital directive		3				
Total	228	252	137	68	182	867

Sources: Board of Governors of the FED Enforcement Action database, the Office of the Comptroller of the Currency (OCC) Enforcement Actions database, the Federal Deposit Insurance Corporation (FDIC) Enforcement Decisions and Orders database, Stanford Law School SCAC Filings Database, the Office of Thrift Supervision (OTS) Enforcement Order Archive.

3.2. Methodology and variable description

The main purpose of this study is to test the hypothesis that the likelihood of fraudulent activities of banks increases if they have powerful CEOs. According to Daboub et al. (1995), corporate level fraudulent activity is the result of the decision of the top management team in the firm; the actions of the top management team may have a function of boosting or defusing the probability of corporate level fraudulent activity. Thus examining the characteristics of the top management team is a way to enhance the knowledge on the behaviour of corporate level fraudulent activities. On the other hand, examining the characteristics of the top management team may not provide enough support to understand the behaviour (Milliken and Martins, 1996; Williams et al., 2005).

[45] Brief descriptions and examples of enforcement actions are provided in Appendix E.

Studies on corporate level fraudulent activities and the top management team characteristics provide mixed results and recommend to be specific on characteristics that provide more functional constructs (Donoher and Reed, 2007; Haleblian and Finkelstein, 1993; Priem et al., 1999).

One of the key components of the decision-making process is power. According to Pfeffer (1981), power is the ability of an individual to dictate his/her will to other individual(s) within the organisation. As Clegg et al. (2006, p. 2) put it:

> "Positive, wonderful things may be achieved with power: tyrannies defeated, democracies created, relationships forged, and freedoms established. Equally however, as we learn from the daily news, the power to achieve each of these good things may entail violence being unleashed, domination being enforced, and manipulation being employed."

In organisations, power has four different forms; the structural power that is originated from the hierarchical arrangements and mentions the power assigned to the top management team and stockholding power that comes from the rights derived from ownership in addition to the expert power and prestige power (Finkelstein, 1992). From another perspective, power grows in an individual's hands by controlling the flow of information through the organisation and allow an individual to increase the control on the decision making process. In this study, CEO power represents the centrality of structural power within the decision-making process.

Two models are employed to measure the effect of CEO power to explain the likelihood of fraud and the likelihood of detecting fraud in publicly-listed US banks after controlling the variables of CEO characteristics, the board of director characteristics, bank financial structure, and industry structure. Four proxies for CEO power are employed in corporate governance literature.

3.2.1. Model 1

For baseline results, a bank clustered probit model is employed to η_i estimate the likelihood of fraud having been committed by US publicly listed banks (conditional on detection of the fraud). The following probit regression equation is measured:

(1) $$P(Y_{it} = 1|X_{it}) = \theta(X'_{it}\beta) + \eta_{it}$$

Where: Y_{it} is a dummy variable indicating the presence of financial fraud, X_{it} is a set of explanatory variables that indicates proxies for CEO power, other CEO characteristics and several bank specific control variables, θ is the cumulative function of the standard normal distribution, η_{it} is the error term, and i and t denote bank and quarter, respectively.

More specifically, the following model is examined, the control variables serve as a baseline in each estimation for individual CEO power proxies and together. The model is estimated as follows;

$$\begin{aligned} Fraud_{\,i,t} = {} & \beta_0 + \beta_1\, CEO\ power\ proxy(-ies)_{\,i,t} + \beta_2\, CEO\ Age_{\,i,t} \\ & + \beta_3\, CEO\ Gender_{\,i,t} + \beta_4\, Experience_{\,i,t} + \beta_5\, CEO\ Education_{\,i,t} \\ & + \beta_6\, Board\ Size_{\,i,t} + \beta_7\, Board\ Independence_{\,i,t} + \beta_8\, Leverage_{\,i,t} \\ & + \beta_9\, ROA_{\,i,t} + \beta_{10}\, Liquidity_{\,i,t} + \beta_{11}\, Loan\ Provision_{\,i,t} \\ & + \beta_{12}\, Capital - Asset\ Ratio_{\,i,t} + \beta_{13}\, Cost - to - Income_{\,i,t} \\ & + \beta_{14}\, Size_{\,i,t} + \beta_{15}\, Financial\ Crisis\ Dummy_{\,i,t} \\ & + \beta_{16}\, Regulatory\ Effectiveness_{\,i,t} + \beta_{17}\, Dodd - Frank\ Dummy_{\,i,t} \end{aligned}$$

where;

- CEO power proxies: CEO Tenure, CEO Ownership, CEO Duality, and CEO Network Size
  - CEO Tenure: Number of years the CEO has served in a position at given year (natural log).
  - CEO Ownership: Binary variable that is 1 if the equity-based compensation of the CEO is greater than the direct compensation, otherwise 0 at given year.

    - CEO Duality: Binary variable that is 1 if the CEO is also chairman, otherwise 0 at given year.
    - CEO Network Size: Number of the CEO's with whom the selected CEO overlaps while in employment, other activities, or education roles at the same firm, organisation, or institution at given year (natural log).
- CEO Age: CEO age in years (natural log) at given year.
- CEO Gender: Binary variable that is 1 if the CEO is female, otherwise 0 at given year.
- Experience: Number of years the CEO has served in any capacity in the same bank at given year (natural log).
- CEO Education: Binary variable that is 1 if the CEO holds at least post-graduate level diploma, otherwise 0 at given year.
- Board Size: Number of directors sitting on the board at given year.
- Board Independence: the percentage of independent non-executive directors on the board at given year.
- Leverage: Total book value of liabilities to total assets ratio at given year.
- ROA: Return on Assets (Earnings before interest and taxes (EBIT) to book value of total assets ratio) at given year.
- Liquidity: Ratio of liquid assets to total assets ratio at given year.
- Loan Provision: Loan loss provision to total loans ratio at given year.
- Capital-Asset Ratio: Capital to risk-weighted total assets ratio at given year.
- Cost-to-Income: Operating expenses to total operating income ratio at given year.
- Size: Total assets of the banks at given year (natural log).
- Financial Crisis Dummy: Binary variable that is 1 in financial crisis years (between 2008 and 2010), otherwise 0 at given years.
- Regulatory Effectiveness: Bank regulators to a total number of employee ratio at given year.
- Dodd-Frank Dummy: Binary variable that is 1 after the pass of the Dodd-Frank Act in 2010, otherwise 0 at given year.

3.2.2. Model 2

A common objection to the standard probit model is that it fails to address the 'partial observability problem' because it treats the probability of detecting fraud as the probability of fraud taking place that creates selection-bias problem (Khanna et al., 2015). By violating the conditional probability of fraud, the standard probit model employs a single equation that estimates the propensity of fraud; this means that the fraud case is being both committed and detected simultaneously. The natures of the probabilities of committing fraud and detecting fraud are different. The probability of committing fraud is reflective a marginal cost and marginal benefit trade off (Long and Polito, 2015). On the other hand, the probability of detecting fraud is directly related to investigations of regulators. The economic interpretation of committing and detecting fraud is exemplified with the imperfect fraud detection process (i.e., not all frauds are detected), the probability of detected fraud is different from the probability of a fraud taking place.

In the literature, there are two approaches are employed to mitigate the partial observability problem. The first approach employs an assumption that undetected fraud cases are not common for the firms with the assets size exceeding $750 million (Dyck et al., 2010). According to this assumption, the overall public that includes regulators, shareholders, and lawyers has a strong incentive to uncover fraudulent activities of the larger firms. The second approach is to employ an econometric model that takes the committing and detecting fraud into consideration; the probability of committing fraud and probability of detecting fraud are latent and distinct. In order to point out the partial observability, Poirier (1980) firstly developed the bivariate probit model. In a similar vein, Feinstein (1990) introduced detection controlled estimation model (DCE). Both of them predict two-stage process that affects the propensity of fraud by measuring committed and detected frauds. The difference between these two estimation models is related to the function of the dependent variables. In DCE, the dependent variable of the fraud equation is used as an explanatory variable in the detection equation, and vice versa. On the other hand, bivariate probit model employs committing fraud and detecting fraud proxies simultaneously. Li (2013) employed the econometric approach of DCE to measure the partial observability of fraud and extended the approach by using DCE Tobit model to estimate the magnitude of the fraud.

In this study, by following Wang et al. (2010), Khanna et al. (2015), and Nguyen et al. (2016), the bivariate probit model is employed to address the partial observability problem of standard probit model. The benefit of bivariate probit model is to directly assess how CEO power affects the likelihood of committing and detecting fraud by controlling corporate governance related proxies and bank specific variables.

For each bank i, F_{it}^{*} is denoted as its incentive to commit a fraud in year t, and D_{it}^{*} as its potential for getting caught conditional on a fraud having been committed:

(2) $$F_{it}^{*} = X_{F,it}\beta + \mu_{it}$$

(3) $$D_{it}^{*} = X_{D,it}\gamma + v_{it}$$

where $X_{F,it}$ is a vector of variables that explains bank i's incentive to commit fraud in year t, and $X_{D.it}$ is a vector of variables that explains bank i's likelihood of being caught, and μ_{it} and v_{it} are zero-mean disturbances with a bivariate normal distribution. For the occurrence of fraud, F_{it}^{*} is transformed into the binary variable F_{it} where F_{it} = 1 if $F_{it}^{*} >$ 0, F_{it} = 0 otherwise. For fraud detection (conditional on a fraud having occurred), D_{it}^{*} is transformed into the binary variable D_{it} where D_{it} = 1 if $D_{it}^{*} > 0$, D_{it} = 0 otherwise. Instead of directly observing F_{it} and D_{it}, $Z_{it} = F_{it}D_{it}$ is observed, where $Z_{it} = 1$ if a bank i has committed a fraud and has been detected, and $Z_{it} = 0$ if bank i has not committed a fraud or has committed a fraud and not been detected. Let Φ denotes the bivariate standard normal cumulative distribution and ρ be the correlation between μ_{it} and v_{it}. The empirical model for Z_{it} is:

(4) $$(PZ_{it} = 1) = P(F_{it}D_{it} = 1) = \Phi(X_{F,it}\beta, X_{D,it}\gamma, \rho)$$

(5) $$(PZ_{it} = 0) = P(F_{it}D_{it} = 0) = 1 - \Phi(X_{F,it}\beta, X_{D,it}\gamma, \rho)$$

The log-likelihood function for the model is:

(6) $$L(\beta, \gamma, \rho) = \sum_{Z_{it}=1} \log(P(Z_{it} = 1) + \sum_{Z_{it}=0} \log(P(Z_{it} = 0))$$

which estimates using the maximum-likelihood method and where the conditions for the model to be identified are that $X_{F,it}$ and $X_{D,it}$ do not contain exactly the same variables and there is variation in the explanatory variable period. The model is estimated as follows;

$$
\begin{aligned}
Fraud_{\,i,t} = {} & \beta_0 + \beta_1\, CEO\ power\ proxy(-ies)_{\,i,t} + \beta_2\, CEO\ Age_{\,i,t} \\
& + \beta_3\, CEO\ Gender_{\,i,t} + \beta_4\, Experience_{\,i,t} + \beta_5\, CEO\ Education_{\,i,t} \\
& + \beta_6\, Board\ Size_{\,i,t} + \beta_7\, Board\ Independence_{\,i,t} + \beta_8\, Leverage_{\,i,t} \\
& + \beta_9\, ROA_{\,i,t} + \beta_{10}\, Liquidity_{\,i,t} + \beta_{11}\, Loan\ Provision_{\,i,t} \\
& + \beta_{12}\, Capital - Asset\ Ratio_{\,i,t} + \beta_{13}\, Cost - to - Income_{\,i,t} \\
& + \beta_{14}\, Size_{\,i,t} + \beta_{15}\, Asset\ Growth_{\,i,t} + \beta_{16}\, Abnormal\ ROA_{\,i,t} \\
& + \beta_{17}\, Adverse\ Stock\ Dummy_{\,i,t} + \beta_{18}\, Abnormal\ Stock\ Turnover_{\,i,t} \\
& + \beta_{19}\, Abnormal\ Stock\ Volatility_{\,i,t} + \beta_{20}\, News\ Ratio_{\,i,t} \\
& + \beta_{21}\, Financial\ Crisis\ Dummy_{\,i,t} \\
& + \beta_{22}\, Regulatory\ Effectiveness_{\,i,t} + \beta_{23}\, Dodd - Frank\ Dummy_{\,i,t}
\end{aligned}
$$

where;

- Dependent and explanatory variables are same as described for Model 1.
- Asset Growth: The percentage change in total assets relative to prior year in given year.
- Abnormal ROA: Residuals of the regression: $ROA_t = \alpha_0 + \alpha_1 ROA_{t-1} + \alpha_2 ROA_{t-2} + \varepsilon$
- Adverse Stock Dummy: Binary variable that is 1 if the stock return is below -20 percent, otherwise 0 in given year.
- Abnormal Stock Turnover: The demeaned average monthly stock turnover in a given year.
- Abnormal Stock Volatility: The demeaned standard deviation of monthly stock volatility in given year.
- News Ratio: Total number of shares that are sold short to average daily trading volume ratio in given year.

3.2.4. Variable descriptions

The motivation for the choice of each explanatory variable is as follows;

CEO Tenure is the number of years the CEO has served in position at given year and employed as a CEO power proxy, where a CEO's power is seen as increasing with length of tenure because it helps build decision-making autonomy and the CEO can influence the selection of other board members (Hermalin and Weisbach, 1998). This approach is also consistent with the agency theory that mentions the conditions that exacerbate the principal-agent problem (Jensen and Meckling, 1976a). The CEO's power on the board of directors comes from the CEO's influence on nominating and selecting board members (Combs et al., 2007). Also, Hermalin and Weisbach (1988) point out that an established CEO has more power than a new CEO. Despite the fact that Beasley (1996) reports the negative and insignificant relationship, by covering more the enforcement actions against banks, the findings of Nguyen et al.'s (2016) work shows that there is a positive relationship between CEO tenure and the likelihood of fraud. The predicted sign of the variable is positive in both models.

CEO Ownership is the binary variable that equals to 1 if the equity-based compensation of the CEO is greater than direct composition (salary and bonus). This variable is employed CEO power proxy, where the converging of interests hypothesis predicts that share ownership binds the CEO's economic interests with those of shareholders and provides the CEO with an incentive to maximise firm performance (Fama and Jensen, 1983). Despite the findings of no connection between insider ownership and firm performance, most of the studies indicate that there is a curvilinear relationship, which indicates the lower firm performance at the higher level of CEO ownership (e.g., Holderness and Sheehan, 1988; Morck et al., 1988). In a recent study, Lilienfeld-Toal and Ruenzi (2014) report that CEO ownership increases the stock market performance especially in firms with weak corporate governance in addition to the literature on the association between CEO ownership and operating firm performance (e.g., McConnell et al., 2008; McConnell and Servaes, 1990). As a CEO power variable, CEO ownership is the stockholding power in addition to the structural power that denotes no restriction on CEO's stock holding. The findings of Khanna et al.'s (2015) work show that there is a

positive and significant relationship between CEO ownership and the likelihood of fraud. The possible reason of this relationship is related to the increased voting right of CEO by increased CEO ownership and ownership-related power. In both models, the expected sign of the relationship is positive.

CEO Duality is the binary variable that equals to 1 if the CEO is also chairman. This variable is used as a CEO power proxy, where the same person simultaneously holding the CEO and Chair positions increase CEO power because it diminishes the role of the board of directors in the controlling CEO decisions (Hermalin and Weisbach, 1998). CEO duality is a common issue that questions the connection with the firm performance in corporate governance (Finkelstein et al., 2009). In connection with the agency theory, the independence of the board from the management of the firm is advocated. Therefore, the monitoring function that is recommended by the literature on principal-agent problem of boards is disrupted by chairman position of the CEO (Gove and Junkunc, 2013). In addition to the lack of monitoring function of the board as a result of CEO duality, flexible accounting principles allow managers to manipulate the income in reports. Regardless of the wrongdoing, influencing reported income and disrupted monitoring function may lead the earning management of CEOs who also hold chair position on the board (Davidson et al., 2004). By employing a sample of 130 publicly-listed firms, O'Connor et al. (2006) report that the likelihood of fraud increases by the indirect effect of CEO duality in some cases; CEO duality is employed in order to get the moderator effect of it in measuring the magnitude and direction of the connection between the CEO stock option and fraudulent reporting of financial statements. The predicted sign of the relationship is positive in Models 1 and 2.

CEO Network Size is the number of the CEO's with whom the selected CEO overlaps while in employment, other activities, or education roles at the same firm, organisation, or institution. This proxy is the size of a CEO's network, with networks viewed as a means for executives to protect each other on their respective boards (El-Khatib et al., 2015; Useem, 1982). In a general description, CEO network covers individuals with whom the CEO is acquainted, through current and past employment, education, and other types of social activities; there is no presumption as to relative status at the time the contact was made (i.e., the CEO may have been a simple board member when the contact was first

made), or as to the strength of the relationship. The literature provides the effect of personal connections in different settings. For example, Engelberg et al. (2012) point out the effect of personal connection between lender and borrower on the amount of loan, interest rate and restriction level of agreement; the connection results with the higher amount of loan, lower interest rate, and less restrictive agreements. Social and business ties of the CEO may affect the committing and detecting fraud in both directions; either a positive or negative relationship is predicted.

CEO Age is one of the measures of CEO characteristics in the literature. Some studies show that younger people are more overconfident (Forbes, 2005; Kovalchik et al., 2005). Besides, CEOs suffer from overconfidence (Malmendier and Tate, 2008, 2005a, 2005b). When people get older, the energy level declines (Roberts and Rosenberg, 2006) and older CEOs prefer a quiet life (Bertrand and Schoar, 2003). On the other hand, scholars find some contradictory results that mention the overconfidence of older CEOs (Billett and Qian, 2008; Doukas and Petmezas, 2007). Despite the fact that Huang et al. (2012) find the negative relationship between CEO age and financial restatement, Khanna et al. (2015) argue that older CEOs are more capable of evading fraud compared to younger CEOs. These examples of the findings indicate that both relationship outcomes are possible.

CEO Gender is a binary variable that is employed to control the effect of CEO gender of the likelihood of fraud in Models 1 and 2. Gender diversity is an essential topic that is argued in the literature. The studies that advocate the gender diversity at top management mention the psychological differences between women and men; women are more risk averse than men (Jianakoplos and Bernasek, 1998; Schubert et al., 2000). Moreover, women are more insist on ethical values (Ford and Richardson, 2013). Inversely, Radtke (2000) finds that female accountants use the similar ethical values on sensitive decisions compared to male accountants. Owhoso (2002) find no evidence from the gender diversity in fraud risk of big five auditing firms in the US. By constructing a survey data from 1585 survey responses to detect the effect gender differences on insurance fraud risk, Tennyson (1997) find little difference between the risk perceptions of consumer towards male and female executives. In a sample of 299 audits in the US, Thiruvadi and Huang (2011) show that the presence of female board member on the audit committee declines the earning

management. On the other hand, Ye et al. (2010) document that female executives have no effect on earning management in a large sample of Chinese firms for the period of 2001 and 2006. The contradictory results of the studies and the difficulties of studying on female CEOs because of the small sample increase the grey areas of this research field. Thus either a positive or negative relationship is predicted.

Experience is the number of years the CEO served in any capacity in the same bank. The purpose of this variable is to control the whole tenure of the CEO by covering the previous positions before CEO position in the bank. In both models, the expected sign of the relationship is positive.

CEO Education is a binary variable that equals to 1 if the CEO holds at least post-graduate level diploma. Malmendier and Tate (2005a) point out that the finance education of CEOs has lower investment-cash flow sensitivity and argue that not only firm level, but also individual level characteristics are important to the corporate decision-making process. The literature on the CEO education shows that type of education that the CEO holds has an effect on the firm R&D funding decision (Barker and Mueller, 2002; Tyler and Steensma, 1998). Also, CEOs who hold MBA degree tend to use capital assets pricing model in calculating the cost of capital (Graham and Harvey, 2002, 2001; Graham et al., 2005). Regarding firm performance, Frey and Detterman (2004) measure the connection between the mean entrance exam scores of the CEOs and their information process in their CEO position to determine the effect of education and show that the CEOs with higher mean entrance exam scores are more successful them the other CEOs. Also, Belliveau et al. (1996) point out that graduation of the CEOs from some distinct schools allow them to make networks with government officials in which they may use the network with government officials when they are in charge. The education may increase the likelihood of fraud regarding learning the different techniques. On the other hand, one of the main purposes of the education is to add some ethical values to students. Thus, either a positive or negative relationship is predicted.

Board Size is the number of members of bank's board. The general approach in determining the function of the board is related to monitoring (Linck et al., 2008). By the presence of the board, the quality of the decision of the top executive managers increases

(Song and Thakor, 2006). It can be concluded that larger board may improve board monitoring capability and may decline the likelihood of fraud (Conyon and Peck, 1998). The predicted sign of the relationship is negative in both models.

Board Independence is the percentage of independent non-executive directors on the board. In this study, the board composition between outside and inside directors is controlled, because the proportion of outside directors on boards and committees, might constrain the authority of CEOs (Hoitash et al., 2009). The expected sign of the relationship is positive.

Leverage is the ratio of total book value of liabilities to total assets. Leverage is related to the profitability of a bank and closely related to asset pricing (Shleifer and Vishny, 1997). Also, increased leverage is associated with more risk-taking behaviour in the financial crisis (Dell'ariccia et al., 2013). The predicted sign of the relationship is positive.

ROA (Return on Assets) is the ratio of earnings before interest and taxes (EBIT) to book value of total assets. As a profitability measure, ROA should be negatively correlated with the risk of the bank (Furfine, 2001). In this study, the profitability is controlled, because powerful CEOs of poorly performing banks could be more likely to commit fraud to inflate earnings (Nguyen et al., 2016). The expected sign of the relationship between ROA and the likelihood of fraud is positive.

Liquidity is the ratio of liquid assets to total assets. Haldane and May (2011) document that banks hold liquid assets to reduce the market liquidity risk. Higher liquidity may decline the likelihood of fraud. In this study, the predicted sign of the relationship between liquidity and the likelihood of fraud is negative.

Loan Provision that is the ratio of loan loss provision to total loans is employed to control the asset quality of banks. Loan loss provisions have a large effect on bank's earnings and regulatory capital and used to provide reserves for the future loan losses (Ahmed et al., 1999). Liu et al. (1997) point out that increased loan loss provision is positively related to the stock market return of a bank if the bank is classified as risky. Higher loan loss

provision may increases the likelihood of fraud in banks. The expected sign of the relationship is positive in both models.

Capital-Asset Ratio is risk-weighted capital to total assets ratio. Nguyen et al. (2016) document that there is a negative relationship between risk-weighted capital of a bank and the likelihood of fraud. In this study, it is expected that the incentives to increase asset risk decline as bank capital increases (Calem and Rob, 1999). The predicted sign of the relationship is negative in Models 1 and 2.

Cost-to-Income Ratio that is the ratio of operating expenses to total operating income is employed to capture bank efficiency, despite its limitations (Lin and Zhang, 2009). In the literature, the cost-to-income ratio is employed as an efficiency and benchmarking metric (e.g., Hess and Francis, 2004). In Model 1 and 2, the expected sign of the relationship is positive.

Size is the total assets of the bank. The firm size and its connection with the agency theory is a historical debate in the literature (Hill and Jones, 1992). The general tendency of literature is tied to the assumption that complexity of the firm and size are positively related (Coles et al., 2008). In related literature, the natural logarithm of total assets is employed as a common control proxy to control firm size. In a similar vein, Wang et al. (2010) employ the natural logarithm of total assets in order to control the firm size and find that there is a positive and significant relationship between the likelihood of fraud and firm size. Also, Nguyen et al. (2016) provide the positive and significant relationship between size and the likelihood of fraud in a sample of US banks. In both models, the expected sign of the relationship is positive.

Asset Growth that is the percentage change in total assets relative to the prior year is employed to detect the probability of fraud. In addition to measuring the firm growth, this variable also captures the firm's needs for external financing (Wang, 2013). The increased external financing needs of the firm might lead the managers to commit fraud to manipulate earnings. This relation allows regulators to take asset growth as a signal of fraudulent activity. The expected relation is positive.

Abnormal ROA that is employed to measure the probability of detecting fraud is the residual of the regression equation:

$$ROA_t = \alpha_0 + \alpha_1 ROA_{t-1} + \alpha_2 ROA_{t-2} + \varepsilon \quad (7)$$

where ROA_t is the return on assets ratio in year t, ROA_{t-1} is the return on assets ratio in year t-1, and ROA_{t-2} is the return on assets ratio in year t-2. ε is the regression residual term that is low if firm's operating performance in year t-1 is worse than that in year t-2 (Wang, 2013). The negative abnormal ROA shows the disappointing operating performance of firm compared to previous years. The declined operating performance in year t-1 might force managers to commit fraud in order to mislead the market (Dyck et al., 2010). An abnormal negative change of ROA in year t might increase investigation intention of regulators on bank and the the likelihood of detecting fraud (Nguyen et al., 2016). In this condition, there is negative relation is predicted.

Adverse Stock Dummy is a binary variable that equals to 1 if the annual stock return is below -20 percent or in the bottom 10 percent of stocks in publicly listed US bank sample of Bloomberg. The reason to select -20 percent of stock return is the cut-off point for the bottom 10 percent of the bank sample (Nguyen et al., 2016). The large negative stock return of a firm might trigger the likelihood of detecting fraud (Wang, 2013). The predicted sign of the relationship is positive.

Abnormal Stock Turnover is the demeaned average monthly stock turnover. The studies state that increased stock turnover increases the litigation risk (Jones and Weingram, 1996; Nguyen et al., 2016; Wang, 2013). The expected sign of the relationship is negative.

Abnormal Stock Volatility is the demeaned standard deviation of monthly stock price change of a bank. The function of this proxy is to control the effect of abnormal stock volatility on the likelihood of detecting fraud (Wang, 2013). The predicted sign of the relationship between abnormal stock volatility and the likelihood of fraud is positive.

News Ratio is the total number of shares that are sold short to the average daily trading volume of a bank. This ratio is also called 'days-to-cover' ratio that indicates the number

of days of short-sellers to cover their positions if positive news of the company lifts the price. Short sellers are experienced investors to anticipate the eventual discovery of fraud and its severity (Karpoff and Lou, 2010). The predicted sign of the relationship between news ratio and the likelihood of fraud is positive.

Financial Crisis Dummy is a binary variable that equals to 1 in financial crisis years. The purpose of employing this variable is to capture the potential impact of the 2008-2010 financial crisis on fraud.

Regulatory Effectiveness that is the bank regulators to total number of employee is employed capture the enforcement capabilities of regulatory agencies. As an increase in the number of enforcement actions against banks might reflect more effective regulatory enforcement rather than an increase in fraud.

Dodd-Frank Dummy is a binary variable that equals to 1 after the pass of the Dodd-Frank Act in 2010. The passage of the Dodd-Frack Act greatly strengthened the hand of regulators. The purpose of this variable is to control the effect of increased legal power of regulators and the effect of the Act on fraud.

4. Descriptive Statistics

In this section, the descriptive statistics of the variables that are employed in univariate and multivariate analyses are examined.

Table 52 provides the descriptive statistics of CEO power variables (CEO Tenure, CEO Ownership, CEO Duality, and CEO Network Size), CEO related variables (CEO Age, CEO Gender, Experience, and Education), board related variables (Board Size and Board Independence), bank related variables (Leverage, ROA, Liquidity, Loan Provision, Capital-Asset Ratio, and Size), and fraud detection variables (Excessive Asset Growth, Abnormal ROA, Adverse Stock Dummy, Abnormal Stock Turnover, Abnormal Stock

Volatility, and News Ratio). The dataset covers the period of 1998 and 2015; there are 18 consecutive years.[46]

The means (medians) of CEO Tenure, CEO Ownership, CEO Duality, and CEO Network Size are 1.143, 0.173, 0.570, and 5.227 (1.281, 0, 1, 5.333), respectively. The average natural logarithm of CEO Age is 4.026. The mean of CEO gender is 0.039, means that only 3.9 percent of the sample is female. The average natural logarithm of CEO experience is 1.729. The average natural logarithm of CEO experience is greater than the average natural logarithm of CEO tenure. This result is consistent with the idea that individuals hold different titles in banks before appointing as a CEO. The average mean education 0.613; more than 60 percent of the CEOs hold at least post-graduate diploma. This is consistent with the finding of Nguyen et al.'s (2016) study on CEO education; they measure the CEO education by having an MBA degree. The average board size consists of 10.77 members, and the finding is consistent with Coles et al. (2008) study that finds the average board size as 10.4. The average natural log of board independence is the ratio of independent board members in the board is 0.778 and consistent with the findings of Mishra and Nielsen's (2000) study that point out the average board independence is 66 percent in large bank holding companies.

The average leverage of the sample banks is 80.44 percent. In the literature, it is stated that bank leverage that is the percentage of total liabilities in total assets is greater than non-financial firm leverage because of the liquidity production role of banks (DeAngelo and Stulz, 2013; Saunders and Cornett, 2015). As a profitability measure, the average ROA is 0.476 and less than the average ROA (0.580) in Nguyen et al.'s (2016) study. The possible reason of the difference is to employ a greater sample of US banks in this study. The average liquidity that is measured by the ratio of liquid assets to total assets is 22.61 percent in sample banks. The mean of loan provision that indicates the ratio of loan loss provision to total loans is 0.213. In given period, the average Capital-Asset ratio and cost-to-income are 10.37 and 71.93 in sample banks, respectively. The average natural logarithm of total assets that is employed to measure the bank size is 0.644. The fraud detection variables that are employed in Model 2 are used to measure the proxies that

[46] Correlation matrix of the selected variables is provided in Appendix G, Table 64.

trigger the detection of fraud in the market (Wang, 2013). The average excessive asset growth that indicates the banks record higher asset growth compared to other banks is 9.432. The average abnormal ROA that shows the relative performance compared to previous periods, adverse stock dummy, abnormal stock turnover, and abnormal stock volatility variables are -0.06, 0.096, 0.057, and 0.005, respectively and close to the findings of Nguyen et al.'s (2016) work. The average news ratio that shows how many days it will take short sellers to cover their positions if positive news about the bank lifts the price is 7.455 days.

Table 52: Descriptive statistics of the sample.

This table provides descriptive statistics of the variables that are employed in univariate and multivariate analyses. Unless stated otherwise, descriptive statistics are derived from the average values calculated by annual data. Board related variables, and bank specific variables are calculated from the average values for each bank from 1998 to 2015. CEO power variables and CEO related variables are calculated from the average values for each CEO at banks from 1998 to 2015. Stock related variables are calculated and annualised from the average monthly values for each bank from 1998 to 2015.

Variables	N	Mean	Median	Std. dev.	p25	p75	Min	Max
CEO Tenure	5147	1.143	1.281	0.979	0.588	1.808	-1.609	3.624
CEO Ownership	5147	0.173	0	0.378	0	0	0	1
CEO Duality	5147	0.570	1	0.495	0	1	0	1
CEO Network Size	5147	5.227	5.333	1.505	4.263	6.324	2.079	9.169
CEO Age	5147	4.026	4.043	0.127	3.951	4.111	3.466	4.477
CEO Gender	5147	0.039	0	0.193	0	0	0	1
Experience	5147	1.729	1	1.154	0	2.097	0	3.932
Education	5147	0.613	1	0.487	0	1	0	1
Board Size	5147	10.77	10	3.271	8	13	4	32
Board Independence	5147	0.778	0.800	0.117	0.714	0.875	0.261	0.947
Leverage	5147	80.44	82.86	10.67	75.31	87.74	5.409	96.54
ROA	5147	0.476	0.780	1.793	0.350	1.110	-9.99	9.510
Liquidity	5147	22.61	20.90	11.94	14.30	29.02	0.330	86.52
Loan Provisions	5147	0.213	0.078	0.459	0.035	0.189	0.015	5.409
Capital-Asset Ratio	5147	10.37	9.640	4.194	8.020	11.83	0.140	65.42
Cost-to-Income	5147	71.93	67.70	23.94	59.38	78.12	6.360	210
Size	5147	0.644	0.240	1.740	-0.53	1.386	-3.216	7.846
Excessive asset growth	5147	9.432	5.802	15.74	0.763	13.88	-20.011	95.01
Abnormal ROA	5147	-0.06	0.199	1.591	-0.09	0.430	-10.013	5.043
Adverse Stock Dummy	5147	0.096	0	0.295	0	0	0	1
Abnormal Stock Turnover	5147	0.057	-0.031	1.027	-0.69	0.738	-5.760	3.660
Abnormal Stock Volatility	5147	0.005	-0.300	1.051	-0.75	0.536	-2.083	6.083
News Ratio	5147	7.455	3.794	9.764	0.923	10.77	0.002	117.4

4. Results

5.1. Univariate Analyses

Table 53 reports the univariate companions of banks that are subject to at least one enforcement action by regulators and class action litigation and banks that are not the subject of the same conditions between 1998 and 2015. For the CEO power variables, fraud sample banks have higher CEO Tenure, CEO Ownership, CEO Duality, and CEO Network Size. For CEO related variables, Compared to banks in the control sample, CEO Age and Experience in fraud sample are greater; banks in fraud sample employ older and more educated CEOs. On the other hand, compared to banks in the fraud sample, banks in control sample employ more female CEOs. Bank board size in fraud sample is significantly greater than that in the control sample. However, there are no significant differences of board independence between fraud sample and control sample banks.

Table 53: Univariate analysis of fraud sample and control sample.

This table summarises comparison of Means of banks that are in fraud sample and control sample. The period is from 1998 to 2015. Statistical significance of Mean differences is tested using t-tests. *, **, *** indicate statistical significance of t-test at the 10%, 5%, and 1% levels respectively.

	Fraud Sample		Control Sample		
Variables	N	Mean	N	Mean	t score
CEO Tenure	2559	1.377	2588	0.9121	-17.54***
CEO Ownership	2559	0.246	2588	0.1001	-14.13***
CEO Duality	2559	0.629	2588	0.512	-8.52***
CEO Network Size	2559	5.428	2588	5.0275	-9.63***
CEO Age	2559	4.037	2588	4.0165	-5.68***
CEO Gender	2559	0.038	2588	0.0402	0.50***
Experience	2559	0.873	2588	0.5873	-8.93***
Education	2559	0.667	2588	0.5599	-7.94***
Board Size	2559	11.09	2588	10.4386	-7.29***
Board Independence	2559	0.779	2588	0.776	-0.90
Leverage	2559	80.16	2588	80.7126	1.84**
ROA	2559	0.433	2588	0.5183	1.70*
Liquidity	2559	23.02	2588	22.1942	-2.48**
Loan Provisions	2559	0.248	2588	0.1789	-5.42***
Capital-Asset Ratio	2559	9.557	2588	11.1633	13.97***
Cost-to-Income	2559	71.66	2588	72.202	0.81
Size	2559	1.187	2588	0.1069	-23.40***
Excessive Asset Growth	2559	8.957	2588	9.9032	2.11**
Abnormal ROA	2559	-0.112	2588	-0.0119	2.23**
Adverse Stock Dummy	2559	0.112	2588	0.0809	-3.71***
Abnormal Stock Turnover	2559	0.218	2588	-0.0987	-10.88***
Abnormal Stock Volatility	2559	0.126	2588	-0.1119	-7.93***
News Ratio	2559	8.133	2588	6.7943	-4.79***

Compared to the banks in control sample, the banks in fraud sample are less leveraged, perform better in term of profitability, and run the business with higher liquidity. The fraud sample banks suffer from the loan returns and provide significantly higher loan loss provision. The average Capital-Asset Ratio in the control sample is significantly greater than that in the fraud sample; banks in the control sample are well-capitalized. On the other hand, in term of efficiency that is indicated by Cost-to-Income ratio, banks in both samples run the business with similar efficiency. The size of the banks in the fraud sample is significantly greater than the size of the banks in the control sample. The average excessive growth and abnormal ROA in control sample banks are greater than those in fraud sample. The return of the stock, abnormal stock turnover, and abnormal stock volatility of the banks in the fraud sample are significantly higher than those of the banks in the control sample. 8.13 days it will take short-sellers to cover their position if positive news about the banks in the fraud sample lifts the price and it is significantly higher than that in the control sample.

5.2. Multivariate Analyses

The bank-clustered marginal effects of the estimations with robust standard errors in Models 1 and 2 are provided in this section. In each model, CEO power variables are individually estimated in Column 1 through 4 to detect the single effects of CEO power variables on the likelihood of fraud. Column 5 in both models is the estimation results for all CEO power variables to measure the effects of CEO power variables collectively. Firstly, results that are shown in Column 1 through 4 are interpreted. Afterwards the interpretation of the estimation results in Column 5 is provided. Bank specific variables (Leverage, ROA, Liquidity, Loan Provisions, Capital-Asset Ratio, Cost-to-income, and Size) are employed in the estimation with their one period lagged values (Wang, 2013).[47] The natural logarithms of CEO Tenure, CEO Network Size, CEO Age, Experience, and Size are employed in models to estimate the ratios rather than differences. Fraud (dependent variable), CEO Ownership, CEO Duality, CEO Gender, Education, and Adverse Stock Dummy, Financial Crisis Dummy, and Dodd-Frank Dummy are binary variables that are set up in 1 and 0 format. In order to control financial crisis, regulatory

[47] The alternative time gaps are checked and the results are robust.

environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The year dummies are employed in all models.

Table 54, Column 1 reports the estimation results of CEO Tenure from the estimate that includes Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables. The results suggest fraud is more likely to have occurred in banks in which the CEO has greater power as measured by the length of tenure. That is, fraud is more likely to have been committed by banks where the CEO has had a relatively long tenure. The results also suggest that fraud is more likely when the CEO is older, has had previous experience in the industry, and relatively well educated. The effect of gender is positive but not significant. Fraud is less likely to have been committed by banks where board size is relatively larger. Board independence has no significant effect on the likelihood of fraud. Several of the bank-specific controls are also statistically significant and suggest that fraud is more likely to be found in banks that are highly leveraged, less well-capitalized, less efficient, and relatively larger. The profitability proxy, ROA, is positive but not statistically significant. Also, the liquidity measure has an insignificant and negative effect on the likelihood of fraud.

Table 54, Column 2 replaces CEO Tenure with CEO Ownership and provides the results of CEO Ownership. The results suggest that the likelihood of fraud increases if the CEO is also the owner of the bank and equity-based compensation of the CEO is greater than direct compensation. Also, the likelihood of fraud increases if the CEO is older, experienced, and holds at least post-graduate degree. The gender difference has no significant effect on the likelihood of fraud. Larger board declines the likelihood of fraud and board independence has no significant effect. The significant results of bank-specific variables show that the likelihood of fraud increases if the bank is highly leveraged and profitable, has greater loan loss provision, less well-capitalized, and relatively larger. The liquidity has no significant effect on the likelihood of fraud.

Table 54: Probit estimates of the likelihood of a bank fraud.

This table reports probit model estimation results in full sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.1351***				0.1359***
		(0.008)				(0.008)
	CEO Ownership		0.0588*			0.0748**
			(0.030)			(0.031)
	CEO Duality			-0.0149		0.0061
				(0.016)		(0.017)
	CEO Network Size				0.0035	0.004
					(0.006)	(0.006)
CEO related	CEO Age	0.2803***	0.4237***	0.4303***	0.4299***	0.2879***
		(0.062)	(0.060)	(0.061)	(0.062)	(0.065)
	CEO Gender	0.0001	0.0126	0.0088	0.0088	0.0032
		(0.039)	(0.038)	(0.038)	(0.038)	(0.039)
	Experience	0.0204***	0.0191***	0.0199***	0.0194***	0.0195***
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	Education	0.0543***	0.0477***	0.0483***	0.0463***	0.0507***
		(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Board related	Board Size	-0.0092***	-0.0102***	-0.0103***	-0.0104***	-0.0094***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	Board Independence	-0.006	0.0487	0.0393	0.0477	-0.0026
		(0.068)	(0.066)	(0.067)	(0.066)	(0.069)
Bank specific	Leverage	0.0056***	0.0048***	0.0049***	0.0048***	0.0056***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.0082	0.0146**	0.0153**	0.0149**	0.0071
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	Liquidity	-0.0007	-0.0008	-0.0007	-0.0007	-0.0007
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.1327***	0.1289***	0.1288***	0.1277***	0.1326***
		(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
	Capital-Asset Ratio	-0.0203***	-0.0231***	-0.0229***	-0.0229***	-0.0206***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Cost-to-Income	0.0016***	0.0012***	0.0013***	0.0012***	0.0015***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Size	0.1247***	0.1131***	0.1205***	0.1175***	0.1157***
		(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
	Financial Crisis	0.0046	0.0093	0.0099	0.0108	0.0030
		(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
	Regulatory Effectiveness	-0.0026	-0.0026	-0.0046	-0.0050	0.0001
		(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
	Dodd-Frank Dummy	-0.1050***	-0.0960***	-0.0982***	-0.0974***	-0.1044***
		(0.040)	(0.039)	(0.039)	(0.039)	(0.040)
	Observations	5144	5144	5144	5144	5144
	Log-likelihood	-2977.72	-3118.76	-3120.19	-3120.43	-2974.6
	Pruedo R2	0.1648	0.1253	0.1249	0.1248	0.1657

Table 54, Column 3 provides the estimation results for CEO Duality that indicates CEO and chairman role of individuals. The marginal effect of CEO Duality on the likelihood of fraud is negative. On the other hand, contrary to expectations, the results suggest that there is no significant relationship between CEO Duality and the likelihood of fraud. The significant results also suggest that fraud is more likely when the CEO is older, experienced, and relatively well educated. The estimation results of board related variables suggest that banks that have relatively smaller boards are more likely to 'wrongdo' while board independence has no significant effect. The estimation results of bank-specific variables suggest that banks that are highly leveraged, profitable, less well-capitalized compared to sample, face loan problems, and relatively larger in the sample are more likely to involve into the fraudulent activities.

Table 54, Column 4 reports the results of CEO Network Size that is measured by using the professional and social networks of the CEOs in the sample. The estimation results show that CEO Network Size has a positive but insignificant effect on likelihood of fraud. The banks with older, experienced, and well-educated CEOs tend to involve into the fraudulent activities. The gender of CEO has no significant effect on the likelihood of fraud. The results also suggest that board size matters but board independence does not; relatively smaller boards increase the likelihood of fraud. According to estimation results, highly leveraged, less well-capitalized, and relatively large banks with higher loan loss provisions face more likelihood of fraud. Profitability and liquidity of the banks in the sample have no significant effect on fraudulent activities.

Table 54, Column 5 provides the estimation results for CEO power variables (CEO Tenure, CEO Ownership, CEO Duality, and CEO Network Size) together. The estimation results indicate that fraud is more likely at banks, which work with the same CEO for relatively longer time and pay much of the CEO compensation with equity-based compensation. CEO Duality and CEO Network Size have positive and insignificant effects on the likelihood of fraud in the sample. CEO Age, Experience, and Education have a positive and significant effect on the likelihood of fraud in which the banks with older, experienced, and relatively well-educated CEOs tend to involve into the fraudulent activities. Board independence has a negative and insignificant effect on the likelihood of fraud. Different than the board independence, board size matters to decide the likelihood

of fraud; the banks with relatively smaller boards are more likely to commit fraud. According to the estimation results of the bank-specific variables, the marginal effects of Leverage, Loan Provisions, Capital-Asset Ratio, Cost-to-Income, and Size are statistically significant, while the marginal effects of ROA, Liquidity are not significant. Under these conditions, it can be concluded that highly leveraged, less well-capitalized, and relatively larger banks with larger loan loss provisions are more likely to be the subject of the fraudulent activities.

The estimation results of CEO Tenure, CEO Ownership, CEO Age, Experience, Education, Board Size, Leverage, Loan Provisions, Capital-Asset Ratio, Cost-to-Income, and Size in Column 1 through 5 provide similar results with the same significance level. Collectively, the results tell a consistent story: The presence of older, experienced, and well educated powerful CEOs, who hold the position longer than others and receive more of his/her compensation in equity-based format, at relatively large and less well-capitalized banks that are highly leveraged with higher loan loss provision increases the likelihood of fraud. Especially, banks with smaller board size tend to be involved in the fraudulent activities because of the lack of monitoring function of the boards (Nguyen et al., 2016).

Table 55, Column 1 provides the estimation results of CEO Tenure on the likelihood of detecting fraud. The results suggest that fraud is more likely to be detected in the sample banks in which the CEO has greater power regarding the length of tenure. That is, fraud of banks is more likely to be detected where the CEO has a relatively long tenure. The results also suggest that fraud is more likely when the CEO is older and relatively well educated. The effect of gender and experience of the CEO are negative and insignificant. Fraud is less likely to be detected where board size is relatively larger and the percentage of independent member on the board is greater. Several of the bank-specific controls are also statistically significant and suggest that detecting fraud is more likely to be in banks that are highly leveraged, illiquid, less well-capitalized, less efficient, and relatively larger. The profitability proxy, ROA, is positive but not statistically significant. In fraud detecting variables, only Excessive Asset Growth and Abnormal Stock Volatility provide significant results. The banks that record more than average asset growth increases the

likelihood of detecting fraud. Also, the more volatile stock of a bank increases the likelihood of detecting fraud.

Table 55, Column 2 replaces CEO Tenure with CEO Ownership and provides the results of CEO Ownership on the likelihood of detecting fraud. The results suggest that the likelihood of detecting fraud increases if the equity-based compensation of the CEO is greater than direct compensation. Also, the likelihood of detecting fraud increases if the CEO is older and earned a degree at least post-graduate level. The gender difference and experience have no significant effect on the likelihood detecting of fraud. Larger board declines the likelihood of detecting fraud and board independence has no significant effect. The significant results of bank-specific variables show that the likelihood of detecting fraud increases if the bank is highly leveraged and illiquid, has greater loan loss provision, less well-capitalized, and relatively larger. The lower level of abnormal stock turnover and higher abnormal stock volatility increase the likelihood of detecting fraud. Additionally, the asset growth that is higher than the average also increases the likelihood of detecting fraud.

Table 55, Column 3 provides the estimation results of CEO Duality on the likelihood of detecting fraud. The results indicate that the likelihood of detecting fraud increases if the CEO holds the chairman position as well. In this setting, younger, female, experienced, and less educated CEOs increase the likelihood of detecting fraud. Also, the likelihood of detecting fraud increases when the board is relatively larger in banks. The marginal effect of Board Independence is positive and insignificant. By evaluating the marginal effects of the bank-specific variables, it can be concluded that highly leveraged, profitable, liquid, less well-capitalized, and larger banks increase the likelihood of detecting fraud. The marginal effects of the fraud detection variables indicate that banks with higher excessive growth rate increase the likelihood of detecting fraud. Highly volatile and negative returned stock of a sample bank also increases the likelihood of detecting fraud.

Table 55: Bivariate probit estimates of the likelihood of detecting bank fraud.

This table reports bivariate probit model estimation results in full sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of detecting fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud by employing fraud detecting variables. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.1224***				0.1442***
		(0.012)				(0.010)
	CEO Ownership		0.1127***			0.0312
			(0.027)			(0.029)
	CEO Duality			0.0602***		0.0964***
				(0.020)		(0.022)
	CEO Network Size				0.0359***	0.0355***
					0.007	(0.007)
CEO related	CEO Age	0.6149***	0.5827***	-0.2003**	-0.0482	-0.2902***
		(0.184)	(0.082)	(0.082)	0.075	(0.079)
	CEO Gender	-0.0704	-0.051	0.1331***	0.2483***	0.1919***
		(0.055)	(0.056)	(0.046)	0.079	(0.052)
	Experience	-0.0064	0.0038	0.0439***	0.0777***	0.0699***
		(0.012)	(0.008)	(0.008)	(0.009)	(0.011)
	Education	0.1116***	0.0943***	-0.0379*	-0.0992***	-0.0719***
		(0.033)	(0.020)	(0.020)	(0.021)	(0.021)
Board related	Board Size	-0.0213***	-0.0185***	0.0193***	0.0118***	0.0212***
		(0.008)	(0.004)	(0.004)	(0.003)	(0.004)
	Board Independence	-0.2070**	-0.014	0.1106	0.0911	0.1435*
		(0.087)	(0.074)	(0.076)	(0.074)	(0.086)
Bank related	Leverage	0.0034**	0.0036***	0.0059***	0.0068***	0.0083***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.0035	0.0075	0.0312***	0.0183**	0.0079
		(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
	Liquidity	-0.0023*	-0.0017**	0.0033***	0.0024***	0.0024***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.1576***	0.1679***	0.0994***	0.0805***	0.0746***
		(0.043)	(0.041)	(0.022)	(0.022)	(0.022)
	Capital-Asset Ratio	-0.0216***	-0.0197***	-0.0187***	-0.0191***	-0.0148***
		(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
	Cost-to-Income	0.0003	0.0001	0.0017***	0.0004	0.0003
		(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
	Size	0.1219***	0.1150***	0.1035***	0.0976***	0.0777***
		(0.009)	(0.011)	(0.010)	(0.009)	(0.012)
Fraud detection	Excessive Asset Growth	0.0010**	0.0015***	0.0025***	0.0025***	0.0022***
		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
	Abnormal ROA	-0.0045	-0.0086	-0.008	-0.0089	-0.0118**
		(0.004)	(0.006)	(0.007)	(0.006)	(0.005)
	Adverse Stock Dummy	0.0324	0.0516	0.0677**	0.0379	0.0294
		(0.022)	(0.031)	(0.030)	(0.031)	(0.033)
	Abnormal Stock Turnover	-0.009	-0.0355***	-0.0279**	-0.0386***	-0.0279**
		(0.007)	(0.012)	(0.011)	(0.011)	(0.011)
	Abnormal Stock Volatility	0.0234***	0.0265***	0.0539***	0.0571***	0.0548***
		(0.009)	(0.010)	(0.010)	(0.010)	(0.010)
	News ratio	0.0002	0.0006	0.0012	0.0015*	0.0017*
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Financial Crisis	Yes	Yes	Yes	Yes	Yes
	Regulatory Effectiveness	Yes	Yes	Yes	Yes	Yes
	Dodd-Frank Dummy	Yes	Yes	Yes	Yes	Yes
	Observations	4622	4622	4622	4622	4622
	Log-likelihood	-2662.85	-2798.11	-2789.65	-2759.05	-2616.04
	Wald chi2	903.33	613.22	685.19	734.02	937.36

Table 55, Column 4 reports the results of CEO Network Size on the likelihood of detecting fraud. CEO Network Size is measured by using the professional and social networks of the CEOs in the sample. The estimation results indicate that CEO Network Size has a positive and significant effect on the likelihood of detecting fraud. The banks with experienced, less well-educated and female CEOs are more likely to be detected by regulators. The age of CEO has no significant effect on the likelihood of detecting fraud. The results also suggest that board size matters but board independence does not; relatively smaller boards increase the likelihood of detecting fraud. According to estimation results, highly leveraged, profitable, illiquid, less well-capitalized, and relatively large banks with higher loan loss provisions are more likely to be detected by regulators. Higher excessive asset growth in banks, highly volatile bank stocks and less abnormal stock turnover increases the likelihood of detecting fraud. Also, the higher news ratio, the number of days needed to cover the short sellers' position if positive news about the banks, is the reason of increased likelihood of detecting fraud.

Table 55, Column 5 provides the estimation results for CEO Tenure, CEO Ownership, CEO Duality, and CEO Network Size together. The estimation results assess that detection of fraud is more likely at banks, which appoint high tenured, larger network owner CEO, who holds the chairman position as well. CEO Ownership has positive and insignificant effect on the likelihood of detecting fraud in the sample. CEO Gender and Experience (CEO Age and Education) have positive (negative) and significant effect on the likelihood of detecting fraud in which the banks with younger, experienced, relatively less well-educated female CEOs are more likely to be detected by regulators. Board size and board independence matter to decide the likelihood of detecting fraud; the banks with relatively larger and independent boards are more likely to be detected. According to the estimation results of the bank-specific variables, the marginal effects of Leverage, Liquidity, Loan Provisions, Capital-Asset Ratio, and Size are statistically significant, while the marginal effects of ROA and Cost-to-Income are not significant. Under these conditions, it can be concluded that highly leveraged, illiquid, less well-capitalized, and relatively larger banks with larger loan loss provisions are more likely to be detected. Highly volatile and less abnormal stock turnover stocks with higher excessive asset growth in banks increase the likelihood of detecting fraud. Additionally, more covering

days for the short sellers that are interpreted from News Ratio increase the likelihood of detecting fraud.

The three of four CEO power variables (CEO Tenure, CEO Duality, and CEO Network Size) provide consistent and significant results in estimations of individual and whole CEO power variables. Also, some of the bank-level variables (Leverage, Loan Provisions, Capital-Asset Ratio, and Size) also provide consistent and significant results. These results tell a story: longer tenured, larger network owner CEOs, who are also the chairman, at highly leveraged, less well-capitalized, and relatively larger banks, which also hold higher loan loss provision, increase the likely of being detected by regulators. Also, partially consistent with the findings of Nguyen et al.'s (2016) work, the estimation results indicate that banks with more than average assets growth with highly volatile stock and high abnormal stock turnover increase the likelihood of detecting fraud.

5.3. Robustness Tests

A number of robustness tests are employed to verify the sustainability of the estimations in Models 1 and 2.[48] Firstly, it is examined that whether estimation results are driven by the repeated cases of fraud. The baseline of Model 1 and Model 2 captures the effect of CEO power variables in full sample. As a substitute method, repeated fraud sample is employed. The rationale behind the construction of a fraud sample with repeated cases from the full sample is to test the effect of CEO power variables on the likelihood of fraud and likelihood of detecting fraud if the tendency to fraudulent activities become continuous. Dorminey et al. (2012) point out that repeated fraud makes the offender de-sensitized. In the process, repeated fraud becomes more continuous in time. The offender, who is white-collar criminal, keeps involving into the fraudulent activities until the harm of the activities is not reversible. The expectation from the estimations with the repeated fraud sample is in a similar vein with those in full sample. In repeated sample, 300 banks involved in the fraudulent activities more than once. The number of banks with two fraudulent activities is 166. The number of banks declines to 87 when the bank has three fraudulent activity in given period. At last, 47 of the banks involved in more than three

[48] Estimation results of the robustness tests are provided in Appendix F.

fraudulent activities in the sample. According to re-estimation results of Model 1 with repeated sample, marginal effects of CEO Tenure, CEO Ownership, and CEO Network Size are positive and significant (Appendix F, Table 58). This is consistent with the estimation results of Model 1 with full sample. In addition to the similar results of the CEO power variables, eight of the control variables provide similar results at estimations of individual and whole CEO power variables. Marginal effects of CEO Age, Experience, Leverage, Loan Provisions, Capital-Asset Ratio, Cost-to-Income, and Size variables are positive and significant in estimations of Model 1 with repeated sample as in those with the full sample; Board Size provides negative and significant marginal effect on the likelihood of fraud. According to these results, the presence of highly tenured CEO, who has higher equity-based compensation than direct compensation, in relatively larger in size and smaller in board size, highly leveraged, and less well-capitalized banks with higher loan loss provision increases the likelihood of fraud. Re-estimation results of Model 2 with repeated sample show that marginal effects of CEO Tenure, CEO Duality, and CEO Network Size are positive and significant and provide similar results with the estimation results with full sample (Appendix F, Table 59). Most of the control variables (CEO Age, CEO Gender, Experience, Education, Board Size, Leverage, Liquidity, Loan Provisions, Capital-Asset Ratio, and Size) provide consistent results in estimations with repeated sample as those in estimations with full sample. Additionally, the marginal effects of two of the fraud detection variables (Excessive Asset Growth and Abnormal Stock Volatility) provide consistent results as well. Under these conditions with repeated sample, the presence of highly tenured and larger network owner CEOs, who hold the chairman position as well, increases the likelihood of detecting fraud. Younger, experienced, less educated, and female CEOs also increases the likelihood of detecting fraud of banks with smaller boards. Bank specific variables indicate that highly leveraged, liquid, less well-capitalized, and relatively larger banks with high loan loss provision face with the increased likelihood of detecting fraud. Additionally, banks with highly volatile stocks and excessive asset growth send the signal of fraud to regulators. Individual CEO power re-estimation results in Model 2 with repeated sample record less consistent results with the estimation results in Model 2 with full sample compared to whole CEO powers re-estimation results in Model 2.

It might be the case that, CEO power is more important for some frauds than for others. For example, if powerful CEOs have less margin in some areas. Nguyen et al. (2016) suggest that the advice of boards of directors might particularly relevant for technical types of fraud. To test this possibility, Model 1 and Model 2 are re-estimated separately for technical and non-technical frauds. Re-estimation results of Model 1 with technical sample show that the marginal effect of CEO Tenure is positive and significant (Appendix F, Table 60). The marginal effect of CEO Ownership that is positive and significant in Model 1 with the full sample is not significant in the technical sample. In the technical sample, the estimation results are consistent for nine control variables (CEO Age, Experience, Education, Board Size, Leverage, Loan Provisions, Capital-Asset Ratio, Cost-to-Income, and Size). The results tell a story: the presence of highly tenured, older, well-educated CEO increases the likelihood of fraud. Additionally, the larger in size, smaller in board size, highly leveraged, less well-capitalized banks with higher loan loss provisions increase the likelihood of fraud in the technical sample. The estimation results of Model 2 with technical sample show that the marginal effects of CEO Tenure and CEO Network Size are positive and significant and consistent with the results of the estimation of Model 2 with full sample (Appendix F, Table 61). In addition to the CEO power variables, CEO Gender, Experience, Education, Board Size, Board Independence, Leverage, Loan Provisions, Capital-Asset Ratio, and Size provide significant results with the same signs in estimations of Model 2 with full and technical samples. The fraud detection variables (Excessive Asset Growth and Abnormal Stock Volatility) provide significant and positive marginal effects in estimations. Thus, highly tenured, experienced, less educated CEOs with the larger network of banks increases the likelihood of detecting fraud. Additionally, board size and board independence of banks increase the likelihood of detecting fraud. Highly leveraged, less well-capitalized, and relatively larger banks with higher loan loss provisions increase the chance of being detected by regulators. Re-estimation results of Model 1 with non-technical sample indicate that marginal effects of CEO Tenure and CEO Ownership are positive and significant (Appendix F, Table 62). This is consistent with the estimation results of Model 1 with full sample. In addition to the CEO power variables, eight of the control variables (CEO Age, Experience, Education, Board Size, Leverage, Loan Provisions, Capital-Asset Ratio, Cost-to-Income, and Size) provide positive and significant marginal effects in

estimations of Model 1 with non-technical sample as in those with full sample; Board Size provides negative and significant marginal effect on likelihood of fraud. Under these conditions, it can be concluded that the presence of highly tenured CEO, who has higher equity-based compensation than bonus and salary, in relatively larger in size and smaller in board size, highly leveraged, and less well-capitalized banks with higher loan loss provision increases the likelihood of fraud. According to the re-estimation results of Model 2 with non-technical sample, marginal effects of CEO Tenure, CEO Duality, and CEO Network Size are positive and significant. They provide similar results with the estimation results with full sample (Appendix F, Table 63). Some control variables (CEO Age, Experience, Education, Board Size, Leverage, Liquidity, Capital-Asset Ratio, and Size) provide consistent results in estimations with repeated sample as those in estimations with full sample. Additionally, the marginal effect of Abnormal Stock Volatility provides the consistent result as well. Thus, the presence of highly tenured and larger network owner CEOs, who hold the chairman position as well, increases the likelihood of detecting fraud. Younger, experienced, and less educated CEOs also increase the likelihood of detecting fraud of banks with larger boards. Bank specific variables indicate that highly leveraged, liquid, less well-capitalized, and relatively larger banks face with the increased likelihood of detecting fraud. Additionally, banks with highly volatile stocks increase the likelihood of detecting fraud. To sum, despite the changes in estimations of individual CEO power variables in different samples, the estimation results for the whole CEO power variables in repeated, technical, and non-technical samples provide consistent results with the estimation results of the whole CEO power variables in full sample. Under these conditions, it can be concluded that the robustness test provides similar results to justify the baseline models and the models that are employed in this study with estimation results of CEO power variables on the likelihood of fraud (Model 1) and the likelihood of detecting fraud (Model 2) are consistent.

6. Conclusion

The main reasons of the corporate scandals have been thought as failures of corporate governance; as such scandals have raised substantial concerns regarding corporate governance effectiveness because recent governance failures that have been apparent in

numerous fraud cases lead to information asymmetry and valuation loss of financial information users such as investors. This view has encouraged certain changes, including the Sarbanes-Oxley Act, Dodd-Frank Act, new regulations, and governance requirements adopted by the US authorities. Fraud cases perpetrated by US banks increased sharply from the late 1990s, soared during the 2008-2011 financial crisis, fell back thereafter but remain well above earlier levels. On the other hand, the corporate governance and organisational behaviour literature argue that the CEO, who has a unique position in the firm, is one the reasons that determine the culture of the firm. The case that CEOs can determine a firm's culture and that culture might rise the firm towards fraudulent activity. That being the case, the greater the power of a CEO within the firm, the more likely the CEO is to influence the firm's culture and the likelihood of it engaging in fraudulent activity. Also, as a special case, the presence of a powerful CEO and spread of this information in the market, the more the likelihood of being detected by regulators. Therefore, the hypothesis that the likelihood of fraudulent activities of banks and the likelihood of detecting fraudulent activities of banks increase if they have powerful CEOs is tested.

In this paper, the purpose is to add to the empirical evidence on this issue and help to fill a still important gap in the corporate governance and bank behaviour literature and try to answer the questions: what determines the likelihood that US banks will engage in financial fraud? What determines the likelihood of being detected by regulators? The substantial corporate governance literature that assigns a central role to the power of CEOs as a determinant of many aspects of bank behaviour is investigated. By analyzing more than 10,000 fraud cases from FED Enforcement Action database, OCC Enforcement Actions database, FDIC Enforcement Decisions and Orders database, SCAC Filings Database, and OTS Enforcement Order Archive, 867 fraud cases of 340 publicly listed US banks are isolated in order to detect the effect of powerful CEO on the likelihood of fraud and the likelihood of detecting fraud. In a sample of 960 publicly listed US banks, it is found that more than one-third of them had committed fraud between 1998 and 2015, with many banks being repeat offenders.

The results from probit analyses with full, repeated, and non-technical samples suggest that the likelihood of finding that a bank had engaged in financial crime is greatest where

CEOs are more powerful as measured CEO tenure and whether CEOs have an ownership stake in the bank. In repeated, technical, and non-technical samples, the marginal effects of CEO Age, Experience, Education, Board Size, Leverage, Loan Provisions, Capital-Asset Ratio, and Cost-to-Income variables are significant. Collectively, older and experienced CEOs, who work with smaller boards in highly leveraged, less well-capitalized banks are more likely to involve into the fraudulent activities.

The results from bivariate probit analyses that are constructed to employ variables in order to measure the likelihood of detecting fraud with full, repeated, and non-technical samples suggest that the likelihood of being detected by a bank regulator in the US is greatest where CEOs are highly tenured, and their equity-based compensation is greater than their direct compensation (salary and bonus). The marginal effects of Experience, Education, Board Size, Leverage, Capital-Asset Ratio, Size, and Abnormal Stock Volatility are significant in four sets of the sample. The consistent story of the collective results points out experienced, less educated CEOs in highly leveraged, less well-capitalized, larger in size and board size banks increase the likelihood of detecting fraud.

Overall, the empirical evidence suggests that principal-agent problem becomes distinct when the CEO has enough time to get more power in the bank, and the bank has a remuneration policy that makes the equity-based payment dominant. This supports the concerns that growing financial crime has adverse implications for the stability of the banking systems and nationally and cross-border.

In recent years, US bank regulators have recorded an increase in their efficiency regarding increased number of closed consumer complaints. By considering that any policy change has potential to exacerbate the selection-bias in the industry, employing better inspection methods, which are randomized, and increasing the quality of investigations, which denotes high-skilled investigators and better information technology use, should prevent financial fraud.

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Appendix A: Selected Studies from the Literature

Table 56: Examples of the literature of corporate crime and financial fraud.

Author(s)	Data Source	Model	Variables	Findings
Alexander and Cohen (1996)	1) Wall Street Journal Index 2)Lexis/Nexis	Logit Regression	1) Earnings Growth 2) EBIT	1) Likelihood of corporate crime in larger firms is significantly greater than in smaller firms. 2) There is a weak relationship between prior earnings growth and corporate crime. 3) There is a significant and negative relationship between EBIT and corporate fraud.
Dechow et al. (1996)	SEC	1) Logit Regression 2) Wilcoxon rank-sum tests	1) Cash flow 2) Accruals 3) Cost of capital 4) Asset ratios 5) Leverage 6) Big six auditors	1) Cash from operations to assets tend to be lower for the SEC firms than the control firms. 2) The difference in accruals between the SEC and control firms is statistically significant in the first year of manipulation. 3) Manipulating earnings initially enables firms to enjoy a lower cost of capital. 4) SEC firms and control firms have similar earnings to asset ratios, earnings to price ratios and market values. 5) The median leverage of the SEC firms is significantly greater than the median leverage of the control firms. 6) There is no significant difference in the use of auditor between the SEC and control firms.
Palmrose et al. (2004)	SEC	OLS regression	1) Cumulative abnormal returns 2) Stock volatility 3) Core earnings	1) Market reaction to the irregularities should be much more than a market reaction to the errors. 2) Restatements involving core accounts have significantly lower and negative average CARs. There is a negative relationship between auditor-initiated restatements and abnormal returns. 3) Restatement announcements are linked to the increasing spreads, and this increase is correlated with more negative stock price reactions. 4) The link between materiality and earning expectations is that restatements of core earnings have more significant and negative forecast revisions.

Farber (2005)	SEC	OLS Regression	1) Audit committee 2) Board independence 3) Abnormal return	1) Fraud firms have poor governance relative to a control sample in the year before fraud detection. 2) The number of audit committee meeting appears to be relatively more important than the composition of the fraud committee for explaining the likelihood of committing fraud. 3) Fraud firms have a fewer number and percentage of independent board members and a higher percentage of CEOs who are also chairman of the board of directors. 4) Fraud firms experience negative abnormal returns over the analysis periods.
Erickson et al. (2006)	SEC	Logit regression	1) market value of equity 2) CEO tenure 3) Total assets 4) Stock volatility 4) ROA 5) Leverage-sales growth	1) There is no consistent evidence of a link between executive equity incentives and accounting fraud. 2) There is no evidence that fraud firm executives exercise stock options to a greater degree than executives at the non-fraud firms. 3) CEO tenure is positively related to the level of equity incentives. 4) Fraud firms have a lower ROA. 5) Fraud firms have fewer total assets; have lower earnings to price, and have lower book-to-market ratios.
Xu et al. (2006)	GAO	OLS Regression	1) Abnormal return 2) Leverage 3) Cash flow 4) Cost of equity capital	1) The restatement does not seem to influence all the firms in the industry that have a high probability of involving the same type of accounting irregularity as the restating firm does. 2) The findings do not detect a significant difference in the abnormal returns between different subgroups and find restating firms experience negative abnormal returns. 3) There is no significant difference between the industries with a low degree of competition and industry with a high degree of competition in both the high-leveraged subsample and low-leveraged subsample. 4) There is a significant contagion effect for rival firms whose cash flow characteristics are similar to those of the restating firm. 5) There is a significant change in the implied cost of equity capital of the rival firms.

Elayan et al. (2008)	SEC	Logit regression	1) ROE 2) Leverage 3) Stock option 4) Stock volatility 5) Information asymmetry	1) The irregularities in firms exhibit both lower transparency and visibility compared to matched sample of non-irregularity. 2) Accounting irregularities in firms are shown to be exhibiting poorer performance. 3) Long-term debt represents an average of 19.3 percent of total assets. The mean difference of the same ratios at two samples is statistically significant. 4) Executives of firms with irregularities receive both significantly higher average incentive compensation in the form of stock options compared to non-irregularity counterparts. 5) Irregularity firms are shown to exhibit greater stock price volatility in the period preceding the accounting irregularities announcements. 6) Firms characterised as having greater levels of information asymmetry are more likely to commit accounting irregularities.
Hennes et al. (2008)	GAO	Logit regression	1) CEO/CFO turnover 2) Total assets 3) Leverage	1) Market reaction to the restatement announcement for irregularities sample is significantly more negative than it is for errors sample. 2) CEO/CFO turnover rates are higher for restatements due to irregularities than those due to errors. 3) Total assets are weakly and significantly higher for the irregularities group at the mean but are insignificantly different at the median. 4) The coefficient on leverage is weakly and significantly positive in the CFO estimation and turnover is more likely for more distressed firms.
Johnson et al. (2009)	SEC	Logit regression	1) Sales growth 2) Audit committee	1) Fraud firms have significantly greater incentives from unrestricted stockholdings than control firms do. 2) Fraud firms have significantly greater pre-fraud sales growth. 3) There is positively related to firm's sales growth and the fraction of insiders on the audit committee, both of which should reduce the likelihood of getting caught committing fraud.

Armstrong et al. (2010)	SEC	Logit regression	Equity incentives	1) Accounting irregularities occur less frequently at firms where CEOs have relatively higher levels of equity incentives. 2) Equity incentives show a positive association with the percentage of the independent directors appointed by the CEO, the percentage of founders on the board, the percentage of shares held by the independent directors, and the degree to which equity incentives are used to compensate independent directors. 3) There is a little statistically significant evidence of an association between accounting irregularities and equity incentives.
Khanna et al. (2015)	1) SEC 2) FSR	Probit regression	1) Stock option 2) Tobin's Q 3) EBITDA 4) Leverage 5) Stock volatility 6) Sales growth	1) Connections of CEOs that are developed with top executives and directors through their appointment decisions increase the risk of corporate fraud. 2) There is a positive and significant relationship between connections and likelihood of wrongdoing. 3) There is a negative relationship between connections and incidence of fraud. 4) Firms with higher leverage and greater stock price volatility are more likely to be linked to fraud. 5) Faster sales growth is related to a higher incidence of fraud, perhaps due to misleading sales figures inflating past sales growth.
Smaili and Labelle (2016)	OSC	Logit regression	1) Board of director characteristics 2) Audit committee	1) The governance mechanisms of firms found in default of financial reporting regulations during the first five years of presence of the Canadian system are weak compared to a sample of no-default firms. 2) There is a significant difference exist between fraudulent firms and matched control firms as far as the board of director characteristics are concerned.

SEC, GAO, and OSC denote the enforcement actions of the US Securities and Exchange Commission, the US Government Accountability Office, and the Ontario Securities Commission, respectively. FSR denotes the Federal Securities Regulation database. Source: Author's own

Appendix B: Theoretical Framework

In this section, we aim to investigate the reasons of fraud by applying a series of theoretical frameworks that have been put forward to investigate why managers engage in unethical behaviour. There are two clear perspectives that might be helpful to understand the backgrounds of fraud: an individual level conceptual framework of fraud and organisational level conceptual framework of fraud. At the individual level, different antecedents of fraud are briefly discussed. Additionally, the fraud triangle theory and the theory of planned behaviour concepts are explored. Firm-level antecedents of fraud, the agency theory that is linked to fraud are shown to provide a better understanding of the presence of the organisational level fraud.

1. Individuals' background of fraud

It is clear that the decision of fraud is affected by the different factors mutually. In addition to the organizational level factors, individual level factors have potential to lead individuals to commit fraud. This is exemplified in the work undertaken by Howell et al. (1986) in which the individual level factors that enhance or neutralize the organizational level factors are listed. Education, age, experience, and gender as demographic factors and self-control as individual trait are discussed in the literature.

1.1. Education

The level of education as one of the individual level factors that might affect the incidence of fraud is positively connected to the level of moral development (Rest, 1986). In contrast to this, Frank et al. (1993) believe that business education might be the reason of declined level of moral development. They use the normative expected utility (Neumann and Morgenstern, 1953), which claims that the business education increases the self-esteem behaviour of individuals. Consistent with this argument, Ghoshal (2005) discusses the teaching ideologically inspired moral theories and finds that business education might lead students to be away from any sense of moral responsibility. In order to support their argument, Williams et al. (2000) find that the relationship between the criminal activity and organisation size becomes stronger if the individuals hold postgraduate education.

Kelley et al. (1990) show that marketing researchers who hold postgraduate business degree provide the least ethical self-ratings. Additionally, Ferraro et al. (2005) point out that economic education helps the rise of morally questionable behaviour among students (e.g. free-riding, defection, selfishness).

1.2. Age

The research on managers' age provides contradictory results in the literature. Shover and Hochstetler (2002) show that age has impact on not only street crime but also white-collar crime. Child (1974) suggests that managers' increasing age increases their risk aversion behaviour in their decisions. These managers seek more information and diagnose more on information before they decide. There are two main bodies of results that try to explain the connection between age and likelihood of fraud. On one side, Gottfredson and Hirschi (1990) point out that youngers are more risk takers and do not take into the consideration of long-term effects of their decisions. Thus, the likelihood of fraud of younger managers are highest than the likelihood of fraud of older managers. On the other side, Kelley et al. (1990) hold the view that the age is inversely related to unethical decisions in which the older managers are relatively close to the fraudulent activities.

1.3. Experience

Experience as an individual level factor is studied in the literature with its mixed results. The effect of experience (especially for senior managers) on the likelihood of illegal actions is associated with the short tenure (Clinard, 1983). On the contrary, other studies on experience show that the positive connection between the long tenure of senior managers and the likelihood of illegal actions. Daboub et al. (1995) use the term "stale in the saddle" to consider the long tenure senior managers within the organisation. These managers are completely close to any change that includes fraud, or even they are passively acquiescing to fraud. From a different point of view, Simpson and Koper (1997) argue that the CEOs with finance background in the manufacturing industry are more likely to attend fraudulent activities than the CEOs from other backgrounds. In addition to tenure and professional background, military experience is also discussed in the literature. Daboub et al. (1995) point out the high resistance of senior managers with the

military background against fraudulent activities. In general, experience related to tenure, professional background, and military experience actively or passively affect the choice of individuals within the organisation.

1.4. Gender

The gender might influence strength and behaviour of managerial fraud. This influence depends on the other individual level factors as well. The results of the limited number of researches in the literature do not undoubtedly shed light on the connection between gender and likelihood of fraud. Betz et al. (1989) find that male business students are more willing to accept fraudulent activities in order to achieve their goals than female counterparts. In another research about the effect of gender on professionals' risk-taking behaviour, Whan (2003) shows that male librarians are more willing to behave unethically than female librarian in order to response the organizational pressure.

1.5. Self-Control

The self-control theory is developed by Hirschi and Gottfredson (1987) in order explain white collar crime as well as street crime. In this theory, crime is related to one common trait named self-control. Individual with low self-control are potential risk takers when they have the opportunity to commit fraud and it is highly related to the instant satisfaction associated with criminal behaviour. According to this view, the firm characteristic is not the major driven of crime; managers' propensity to commit in fraudulent activities is the main reason of crime. Following the self-control theory, Reed and Yeager (1996) offer a mechanism of restricting the low self-control of senior managers in order to limit the fraudulent activities of top management.

2. Theories at individual level

Several conceptual frameworks are used in order to understand the nature of fraud in the literature. The main purpose of these works is to investigate why individuals engage in unethical activities that lead fraud at corporate level.

2.1. Fraud triangle theory

The attribution theory that is employed to explain why people usually predict more negative behaviours regarding individuals' attitudes rather than pressures of the events or opportunities (Jones, 1990; Ybarra and Stephan, 1999). Within the same context, the term 'fraud' denotes negative behaviour in regulations and studies of the related fields. Ammenberg et al. (2001) and Shelton et al. (2001) point out that the auditors' misleading perceptions on management's attitudes might negatively affect the decisions in investigations. AICPA SAS No. 99 (2002, para. 24) states:

> "… The auditor should inquire of others within the entity about the existence or suspicion of fraud. The auditor should use professional judgment to determine those others within the entity to whom inquiries should be directed and the extent of such inquiries. In making this determination, the auditor should consider whether others within the entity may be able to provide information that will be helpful to the auditor in identifying risks of material misstatement due to fraud."

In pertinent part, AICPA SAS No. 99 (2002, para. 27) provides:

> "The auditor should be aware when evaluating management's responses to the inquiries that management is often in the best position to perpetrate fraud. The auditor should use professional judgment in deciding when it is necessary to corroborate responses to inquiries with other information. However, when responses are inconsistent among inquiries, the auditor should obtain additional audit evidence to resolve the inconsistencies."

As it is discussed above, trusting only the management's attitudes might mislead the auditor; the auditor should use other resources to investigate the entity about the existence or suspicion of fraud. Assessing the management's attitudes is especially difficult if the manager tries to deceive the auditor. On the other hand, change in the management's attitude might occur in a short period, even if there is no purpose of deceiving auditors. In both cases, trusting management's attitudes might produce false outcomes for the auditors.

The regulations outline numerous indicators of fraud; these indicators are the potential symptoms in company's business environment that would produce a higher risk of fraud. In related part, AICPA SAS No. 99 (2002, para. 7) provides:

> "Three conditions generally are present when fraud occurs. First, management or other employees have an incentive or are under pressure, which provides a reason to commit fraud. Second, circumstances exit – for example, the absence of controls, ineffective controls, or the ability of management to override controls – that provide an opportunity for a fraud to be perpetrated. Third, those involved are able to rationalize committing a fraudulent act. Some individuals possess an attitude, character, or set of ethical values that allow them to knowingly and intentionally commit a dishonest act. However, even otherwise honest individuals can commit fraud in an environment that imposes sufficient pressure on them. The greater the incentive or pressure, the more likely an individual will be able to rationalize the acceptability of committing fraud."

The three conditions that are mentioned above are the components of the fraud triangle theory. These components are management's 'incentives/pressures' (moral reason to commit fraud), 'opportunities' (the ineffective controls, absence of controls, or the management's ability to override controls), and 'attitudes/rationalization' (some set of ethical values that allow management to commit fraud) (Wilks and Zimbelman, 2004).

2.1.1. Incentives/pressures

As a corner of the fraud triangle, 'incentives/pressures' is the moral reason, such as aggressive earning targets (Albrecht et al., 1986; Bell and Carcello, 2000; Loebbecke et al., 1989) or earning manipulation (Dechow et al., 1996; Johnson et al., 2009) to commit fraud. In this context, the non-financial pressure is related to human needs and work-related pressure. The human needs might lead management to involve into the fraudulent activities. Dellaportas (2013) documents that work-related pressure is associated with professional links to management with other employees; if the management does not trust the other employees, management might defraud in such a working environment. Skousen et al. (2009) point out that financial pressure on management is related

managers' financial conditions and the expectations and requirements of the external third parties such as stock market participants and financial analysts. The pressure originated from the stakeholders of the company is also associated with the management compensation policy. Under the pressure of equity-based compensation, management might defraud to release good news to the market.

2.1.2. Opportunities

One of the main driven by the fraudulent activity of management is the belief of being not caught. This belief is fed by the ineffective corporate governance environment within the company. The opportunities may erase because of the lack of board independence (Beasley, 1996) and ineffective internal auditing mechanisms (Beasley et al., 2000). On the other hand, the ineffective regulations also provide opportunities for management to involve into the fraudulent activities (Uzun et al., 2004).

2.1.3. Rationalization

Incentives and opportunities in fraud triangle theory are arguably easy to detect. Hence, regulators can establish regulations to prevent the reasons of incentives, pressures, and opportunities to create a fraud-free environment. On the other hand, rationalisation is relatively cognitive, internal by nature, and hidden. Assessing rationalisation of the fraudulent activities is difficult in cases and need more attention in the process of establishing regulations. Understanding this corner of the fraud triangle can provide better insights that auditors improve their investigation abilities and understand the threat from the rationalisation of the fraudulent activities. Previous cases and the list of rationalisation of the previous fraudulent activities might be used as guidelines to detect the fraud within the firm.

2.2. Theory of planned behaviour

There is a general agreement among social psychologists in which most human behaviour is goal-directed (Heider, 1958; Lewin, 1951). In the routine, a certain sequence of actions is habitual and performed automatically. Hence, some actions controlled by intensions

are revised to fit changing conditions. Fishbein and Ajzen (1975) examine the relations between intensions and actions and point out the changes in intensions and how changed intentions affect the actions. In this procedure, goals and plans of individuals' affect behaviour, and then people change their intensions.

The theory of reasoned action which is the pillar of the theory of planned behaviour is designed to predict volitional behaviours to understand the psychological determinants of individuals (Ajzen and Fishbein, 1980). In the theory of reasoned actions, it is documented that most of the behaviours of daily life may be considered under volitional control to perform these behaviours easily if individuals are apt to do so. The theory assumes that individuals implicitly or explicitly consider the implications of their actions and behave sensibly. The mechanism predicts that an individual's intention to act (or not to act) behaviour is the determinant of that action.

As it is mentioned above, intentions are closely tied to actions. Ajzen (2001, 1991) points out the role of intentions to explain the behaviours. The theory of planned behaviour, which is rooted from the theory of reasoned actions, has three components: attitudes toward the behaviour, subjective norms, and perceived behavioural control. According to Ajzen (1991), the attitudes toward the behaviour refers to the degree to which an individual produces a positive or negative evaluation in question. The beliefs that the behaviour leads to certain outcomes and the evaluations of these outcomes are positive or negative.

The social norm is the perception of individuals who should or should not perform the behaviour to complete the action (Fishbein and Ajzen, 1975). In other research, Ajzen and Driver (1992) define the social norms as "perceived influence of significant others". In this study, they measure the social norms with two questions: "most people who are important to me approve/disapprove of my engaging in this activity" and "most people who are important in my life think I should engage in this activity". On the other hand, Beck and Ajzen (1991) ask the following questions in order to point out the prediction of dishonest actions: (1) "if I cheated on a test or exam, most of the people who are important to me would not: care-disapprove", (2) "no one who is important to me think it is OK to cheat on a test or exam: agree-disagree", and (3) "most people who are important to me

will look down on me if I cheat on a test or exam: likely-unlikely". It is stated from these definitions and questions that subjective norms are not related to any economic or social incentives, the only driven by the individual's perceptions is the opinion of a few others who are important for the individual.

Perceived behavioural control as "the perceived ease or difficulty of performing the behaviour and it is assumed to reflect experience as well as anticipated impediments and obstacles" (Ajzen, 1988). Similarly, Ajzen and Driver (1992) document the concept as the "perceived facilitation or constraints on the performance of the behaviour". In order to measure the perceived behavioural control, the following questions are asked: "for me to engage in this activity is difficult/easy" and "I believe I have the resources required to perform this activity". Additionally, Beck and Ajzen (1991) design the following questions: "for me to cheat on a test or exam is: easy-difficult", "if I want to, I can cheat on a test or exam: true-false", "I can imagine times when I might cheat on a test or exam even if I hadn't planned to: likely-unlikely" and "even if I had a good reason, I could not bring myself to cheat on a test or exam: likely-unlikely". Briefly, based on previous experiences and any expected obstacles they may face, perceived behavioural control is the individual's ability to perform the behaviour (Hess, 2007).

Both the theory of planned behaviour and the theory of reasoned action are already used to explain fraudulent activities. Hess (2007) points out that the theory of planned behaviour is "parsimonious model but also has significant power in explaining variations in intensions. The simplicity of the model also makes it useful for understanding and explaining the various studies that have been conducted on ethical behaviour in organisations". In an experiment and survey analysis, Carpenter and Reimers (2005) show that the theory of planned behaviour helps to explain the fraudulent activity. Additionally, Gillett and Uddin (2005) construct a structural model based on the theory of reasoned action, including company size and compensation structure. They document that the structural model explains the fraudulent activities and that attitude and size are the main drivers of fraud.

2.3. Combining the theory of planned behaviour and the fraud triangle theory

The theory of planned behaviour and the fraud triangle theory are already used in empirical studies separately to detect the nature of fraud and the connection between the unethical behaviour and fraud. Following Cohen et al. (2008), the components of these two theories are combined to increase the accuracy and explanatory power of fraud behaviour.

The theories that are mentioned above do not share the common 'attitude/rationalisation' component. In the fraud triangle theory, 'attitudes/rationalisation' refers to a broad concept as some set of ethical values that aloe management to commit fraud. With this form, 'attitudes/rationalisation' component of the fraud triangle theory covered attitude, subjective norms and perceived behavioural control components of the theory of planned behaviour.

'incentives/pressures' and 'opportunities' components of the fraud triangle theory show the external stimuli of the fraud behaviour and are not covered in the theory of planned behaviour. This difference is acceptable because opportunities are easy to measure and can be defined as certain behavioural control. On the other hand, perceived behaviour of control depends on individuals' perception in which engaging in the particular behaviour changes according to choices. Despite the differences between the two theories, Beck and Ajzen (1991, p. 286) point out that "the degree of success will depend not only on one's desire or intention but also on such partly non-motivational factors as availability of requisite opportunities and resources (i.e., time, money, skills, cooperation of others)". This argument states that perceived behavioural control depends on intentions as well as opportunities which are defined as non-motivational factors.

As a conclusion, 'attitudes/rationalisation' component of the fraud triangle theory is broad and includes grey areas in the definition. The theory of planned behaviour provides the details of this component. In the combined form, these two theories are complementary. Hence, the intention to act of fraudulent activity is the completed form of the theory of planned behaviour (replaced with 'attitudes/rationalization'),

‘incentives/pressures’ and ‘opportunities’. If the specific motivation of individuals, who are in charge, is consistent, a company may engage in a fraudulent activity (Sauer, 2002).

3. Organisational background of fraud

In order to promote effective corporate governance, Jensen (1993) defines organizational-level factors. The internal organizational-level factors are organisational culture, board structure and senior leadership.

3.1. Organisational culture

Some organisations produce deviant culture; in this cultural form, wrongdoing is rationalised and institutionalised. This process starts with an injection of law-breakings, which suggest the normative ethical status of ‘business as usual’. Then, fraudulent activities are produced in white-collar setting (Reed and Yeager, 1996).

In the literature, Trice and Beyer (1993) identify characteristics in which subcultures get stronger within the organisations. These characteristics are group-based versus individual-based rewards, member stability and cohesion, peer-based socialisation, physical proximity, high within-group task interdependence, low between-group task interdependence and accountability for performance goals but not means. Additionally, Ashforth and Meal (1989) define the incidence of negative subcultures as the result of the separation of identities into categories. These subcultures hold the values that are apart from the overall social norms and individual ethical norms trigger deviant cultures in organisations. In contrast, McKendall and Wagner (1997) detect positive ethical climate which reduces the likelihood of fraud in organisations. They point out that strong ethical culture neutralises the relationships between the illegal behaviour of fraudulent activities and organisational factors.

3.2. Board structure

In modern corporate governance, ownership and control are separated (Fama, 1980). The separation of ownership and control creates a free-rider problem, where no individual

stockholder has large enough power to devote the resources necessary to monitor senior management. The free-rider problem increases the probability of opportunistic behaviour of managers to enrich themselves (Grossman and Hart, 1980).

In public corporations, the device that is created to monitor top management is board of directors. The functionality of board of directors evolve in time; board of directors is more active monitors today. Additionally, the increasing number of outside directors, who act independently from management, on boards strength the monitoring function (Fama and Jensen, 1983; Zahra and Pearce, 1989).

Beasley (1996) shows that the likelihood of fraudulent activity increases if the company has fewer outside board members, although Kesner et al. (1986) find no evidence of that outside board members change the likelihood of fraud. In another study, Beasley et al. (2000) document that weaker governance mechanisms (fewer audit committees, less independent audit committees and boards, and fewer audit committee meetings) lead committing fraud. Additionally, Summers and Sweeney (1998) find that not only corporate governance mechanism but also company specific conditions (rapid company growth, setting unrealistic financial targets in the projected future) are potential predictors to detect the committing fraud. In detail, Loebbecke et al. (1989) use rapid company growth as 'red flag' indicator of fraud.

In the literature, defining 'red flags' indicators that are signals of fraudulent activity, rather than the direct indicators and causes, become a trend. Compensation is used as a red flag. For example, Guidry et al. (1999) show that CEO bonuses are associated with earning management, whereas Barton (2001) points out that management of a sample of Fortune 500 firms involves the earning management to increase cash compensation.

To better understand the mechanism of corporate governance, Fama and Jensen (1983) detail the relations between managerial ownership and agency problem. They find that stock ownership by managers reduces the agency problems. Directors' stock ownership decreases the likelihood of fraud (Beasley, 1996). In contrast, Loebbecke et al. (1989) point out that the ownership by senior managers leads them to manipulate stock prices by fraudulent activities.

3.3. Senior leadership

Top management, especially the CEO, has a significant effect on the ethical climate of the organisation. The leadership of top management leads all components of the organisation to analyse and criticise the ethical evaluation. Additionally, top management sets the norms and code of ethics of the organisation. In contrast, top managers, who do not pay attention to the norms of ethics, widespread the fraud within the organisation. Baucus (1994) observes that the CEO, even the CEO does not engage in fraud, can encourage the individuals by rewarding, ignoring, and condoning their fraudulent activities.

3.4. Agency theory linked to fraud

According to a definition provided by OECD (2014), corporate governance is a set of policies, regulations and processes to manage and administer the organisations. Bradley et al. (1999, p. 11) state: "Corporate governance also implicates how the various constituencies that define the business enterprise serve, and are served by, the corporation. Implicit and explicit relationships between the corporation and its employees, creditors, suppliers, customers, host communities-and relationships among these constituencies themselves-fall within the ambit of a relevant definition of corporate governance." In a similar manner, Solomon (2007, p. 14) provides the definition of corporate governance as "the system of checks and balances, both internal and external to companies, which ensures that companies discharge their accountability to all their stakeholders and act in a socially responsible way in all areas of their business activity".

Broadly, corporate governance covers the relationships, rights and responsibilities of stakeholders (Rezaee, 2005). Internal corporate governance consists of the mechanisms that employ boards to assure stakeholder interests, whereas external corporate governance has mechanisms to perform monitoring activities, which are required by related laws (Baber et al., 2006). Effective internal and external corporate governance mechanisms, which mitigate the agency problems, promote the integrity of the financial reporting process and control information asymmetry (McKnight and Weir, 2009; Skaife et al., 2004).

Agency problems arise when principals have a lack of enough power to discipline the agent. On the other hand, the same problems arise when agents prioritise their interests against principals. The economic approach to crime and punishment is also essential to understand the agency problem. Becker (1968) states the mechanisms of crime and punishment with optimality. According to him, the optimal decision of individuals is associated with the minimization of social loss. The broad definition of loss covers the sum of damages, costs of apprehension and conviction and costs of carrying out the punishment imposed. In the case of agency problem, shareholder wealth may be declined (Arnold and de Lange, 2004; McMenamin, 2002). In a pioneering study, Jensen and Meckling (1976) document that agency theory proposes the mechanisms to solve agency problem.

Agency problems and information asymmetry promote the demand for proper financial reporting and information disclosure (Healy and Palepu, 2001). From the point of view of principals, who have rights to observe the true economic performance of a company, information asymmetry that is exploited by the management declines the reliability of corporate information (Healy and Wahlen, 1999).

Empirical studies show that fraud and inappropriate financial reporting practices, such as misstatements, are associated with poor corporate governance practices (Dechow et al., 1996; He et al., 2009; Jiang et al., 2008; Klein, 2002). Managers (agents) are employed to improve the quality and effectiveness of financial reporting to decline the information asymmetry (Barth et al., 2001). However, fraud might occur when managers are highly motivated to manipulate financial reporting to mislead the other stakeholders (Li, 2011).

Appendix C: Legal Framework

Historically, bank fraud in the United States took marginal interests of bank regulators and lawyers that targeted to limit the embezzlement and theft. The internationalisation process of the financial markets and the technological jump in the last decades differentiated the type and impact of bank fraud. In addition to these improvements in local and global markets, the financial crises have also affected the frequency and nature of bank fraud. With a broad collection of acts, it is clear that federal authorities are eager to be proactive to attack bank fraud. This section discusses the application of the main criminal acts available.

1. Bank fraud

The section 1344 of Title 18 (as amended in 1989 and 1990) explains the prohibition of any attempt to defraud a federally insured financial institution. The section is the main bank fraud act and is not limited to common law concepts of fraud. The term "bank" covers bank, saving associations, credit unions, and related holding companies.

Section 1344 (Mail Fraud Act, 1994a) states:

> "Whoever knowingly executes, or attempts to execute, a scheme or artifice (1) to defraud a financial institution; or (2) to obtain any of the moneys, funds, credits, assets, securities, or other property owned by, or under the custody or control of, a financial institution, by means of false or fraudulent pretences, representations, or promises; shall be fined not more than $1,000,000 or imprisoned not more than 30 years, or both."

In order to protect federally chartered, controlled or insured financial institution from material fraud, the section was enacted. The defendant knowingly and wilfully engaged in defrauding a federally insured financial institution, or the defendant participated in obtaining gain or control the financial institution using false statements and representations.

2. Bank larceny

The section 2113(b) of Title 18 (as amended in 1996 and 2002) addresses larceny in which the prohibition of intentionally stealing or purloining any property in the custody of a financial institution.

In pertinent part of Section 2113(b) (Mail Fraud Act, 1994b), it states:

> "Whoever takes and carries away, with intent to steal or purloin, any property or money or any other thing of value exceeding $1,000 belonging to, or in the care, custody, control, management, or possession of any bank, credit union, or any savings and loan association, shall be fined under this title or imprisoned not more than ten years, or both."

It is clear that the defendant intentionally took or carried away money more than $1,000 which is in the control, management, or possession of the bank.

3. Money laundering

Both civil and criminal penalties for money laundering is provided in Section 1956 of Title 18 (as recently amended in 2006, 2008, 2009, 2012 and 2016).

Section 1956 (Mail Fraud Act, 1994c) states:

> "(1) Whoever, knowing that the property involved in a financial transaction represents the proceeds of some form of unlawful activity, conducts or attempts to conduct such a financial transaction which in fact involves the proceeds of specified unlawful activity— (A) (i) with the intent to promote the carrying on of specified unlawful activity; or (ii) with intent to engage in conduct constituting a violation of section 7201 or 7206 of the Internal Revenue Code of 1986; or (B) knowing that the transaction is designed in whole or in part— (i) to conceal or disguise the nature, the location, the source, the ownership, or the control of the proceeds of specified unlawful activity; or (ii) to avoid a transaction reporting

> requirement under State or Federal law, shall be sentenced to a fine of not more than $500,000 or twice the value of the property involved in the transaction, whichever is greater, or imprisonment for not more than twenty years, or both. For purposes of this paragraph, a financial transaction shall be considered to be one involving the proceeds of specified unlawful activity if it is part of a set of parallel or dependent transactions, any one of which involves the proceeds of specified unlawful activity, and all of which are part of a single plan or arrangement."

The stated parts define that the defendant who conducted or attempted to conduct a transaction with the property, had enough information about the property represented proceeds from some illegal activity. Especially, the defendant intentionally continued an illegal act against specified sections of Title 18.

In pertinent part, Section 1956 (Mail Fraud Act, 1994c) states:

> "(2) Whoever transports, transmits, or transfers, or attempts to transport, transmit, or transfer a monetary instrument or funds from a place in the United States to or through a place outside the United States or to a place in the United States from or through a place outside the United States— (A) with the intent to promote the carrying on of specified unlawful activity; or (B) knowing that the monetary instrument or funds involved in the transportation, transmission, or transfer represent the proceeds of some form of unlawful activity and knowing that such transportation, transmission, or transfer is designed in whole or in part— (i) to conceal or disguise the nature, the location, the source, the ownership, or the control of the proceeds of specified unlawful activity; or (ii) to avoid a transaction reporting requirement under State or Federal law, shall be sentenced to a fine of not more than $500,000 or twice the value of the monetary instrument or funds involved in the transportation, transmission, or transfer, whichever is greater, or imprisonment for not more than twenty years, or both. For the purpose of the offense described in subparagraph (B), the defendant's knowledge may be established by proof that a law enforcement officer represented the matter

> specified in subparagraph (B) as true, and the defendant's subsequent statements or actions indicate that the defendant believed such representations to be true."

The section prohibits any illegal fund movements, which are materially fraud, from the United States, or through the United States.

In another pertinent part, Section 1956 (Mail Fraud Act, 1994c) provides:

> "(2) Whoever, with the intent— (A) to promote the carrying on of specified unlawful activity; (B) to conceal or disguise the nature, location, source, ownership, or control of property believed to be the proceeds of specified unlawful activity; or (C) to avoid a transaction reporting requirement under State or Federal law, conducts or attempts to conduct a financial transaction involving property represented to be the proceeds of specified unlawful activity, or property used to conduct or facilitate specified unlawful activity, shall be fined under this title or imprisoned for not more than 20 years, or both. For purposes of this paragraph and paragraph (2), the term "represented" means any representation made by a law enforcement officer or by another person at the direction of, or with the approval of, a Federal official authorized to investigate or prosecute violations of this section."

In this section, the act defines the nature of the transaction and the violation against the nature of the transaction specified in the body of the text.

4. Failure to comply with reporting requirements

Transactions of domestic financial institutions for the amount of cash over the limit that is specified by the Secretary of the Treasury must be reported to the Federal Government. The related federal laws specify the limit of these transactions and the penalties for the violation of reporting. The section 5313 of Title 31 (as amended in 1994) addresses the failure to comply with reporting requirements.

In pertinent part, Section 5313 (Monetary Transactions Act, 1994a) states:

> "(a) When a domestic financial institution is involved in a transaction for the payment, receipt, or transfer of United States coins or currency (or other monetary instruments the Secretary of the Treasury prescribes), in an amount, denomination, or amount and denomination, or under circumstances the Secretary prescribes by regulation, the institution and any other participant in the transaction the Secretary may prescribe shall file a report on the transaction at the time and in the way the Secretary prescribes. A participant acting for another person shall make the report as the agent or bailee of the person and identify the person for whom the transaction is being made. (B) The Secretary may designate a domestic financial institution as an agent of the United States Government to receive a report under this section. However, the Secretary may designate a domestic financial institution that is not insured, chartered, examined, or registered as a domestic financial institution only if the institution consents. The Secretary may suspend or revoke a designation for a violation of this subchapter or a regulation under this subchapter (except a violation of section 5315 of this title or a regulation prescribed under section 5315), section 411 of the National Housing Act (12 U.S.C. 1730d), or section 21 of the Federal Deposit Insurance Act (12 U.S.C. 1829b). (C) (1) A person (except a domestic financial institution designated under subsection (b) of this section) required to file a report under this section shall file the report— (A) with the institution involved in the transaction if the institution was designated; (B) in the way the Secretary prescribes when the institution was not designated; or (C) with the Secretary. (2) The Secretary shall prescribe— (A) the filing procedure for a domestic financial institution designated under subsection (b) of this section; and (B) the way the institution shall submit reports filed with it."

Section 5313 violation penalties are set by Section 5322 of Title 31 (Monetary Transactions Act, 1994b).

> "(a) A person wilfully violating this subchapter or a regulation prescribed under this subchapter … shall be fined not more than $250,000, or imprisoned for not more than five years, or both. (b) A person wilfully violating this subchapter or a regulation prescribed under this chapter …, while violating another law of the

United States or as part of a pattern of any illegal activity involving more than $100,000 in a 12-month period, shall be fined not more than $500,000, or imprisoned for not more than ten years, or both."

5. False entries

Sections 1001 (as amended in 1996), 1005 (as amended in 1990 and 2002) and 1006 (amended in 1999, 2008 and 2010) of Title 18 cover the federal criminal acts of false entries, false entries in reports and transactions of banks and thrift institutions.

Section 1001 (Mail Fraud Act, 1994d) provides:

"(a) Except as otherwise provided in this section, whoever, in any matter within the jurisdiction of the executive, legislative, or judicial branch of the Government of the United States, knowingly and wilfully (1) falsifies, conceals, or covers up by any trick, scheme, or device a material fact; (2) makes any materially false, fictitious, or fraudulent statement or representation; or (3) makes or uses any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement or entry; shall be fined under this title, imprisoned not more than 5 years or, if the offense involves international or domestic terrorism (as defined in section 2331), imprisoned not more than 8 years, or both. If the matter relates to an offense under chapter 109A, 109B, 110, or 117, or section 1591, then the term of imprisonment imposed under this section shall be not more than 8 years. (b) Subsection (a) does not apply to a party to a judicial proceeding, or that party's counsel, for statements, representations, writings or documents submitted by such party or counsel to a judge or magistrate in that proceeding. (c) With respect to any matter within the jurisdiction of the legislative branch, subsection (a) shall apply only to (1) administrative matters, including a claim for payment, a matter related to the procurement of property or services, personnel or employment practices, or support services, or a document required by law, rule, or regulation to be submitted to the Congress or any office or officer within the legislative branch; or (2) any investigation or review, conducted pursuant to the

authority of any committee, subcommittee, commission or office of the Congress, consistent with applicable rules of the House or Senate."

Section 1005 (Mail Fraud Act, 1994e) provides:

> "Whoever, being an officer, director, agent or employee of any Federal Reserve bank, member bank, depository institution holding company, national bank, insured bank, branch or agency of a foreign bank, or organization operating under section 25 or section 25(a) of the Federal Reserve Act, without authority from the directors of such bank, branch, agency, or organization or company, issues or puts in circulation any notes of such bank, branch, agency, or organization or company; or whoever, without such authority, makes, draws, issues, puts forth, or assigns any certificate of deposit, draft, order, bill of exchange, acceptance, note, debenture, bond, or other obligation, or mortgage, judgment or decree; or whoever makes any false entry in any book, report, or statement of such bank, company, branch, agency, or organization with intent to injure or defraud such bank, company, branch, agency, or organization, or any other company, body politic or corporate, or any individual person, or to deceive any officer of such bank, company, branch, agency, or organization, or the Comptroller of the Currency, or the Federal Deposit Insurance Corporation, or any agent or examiner appointed to examine the affairs of such bank, company, branch, agency, or organization, or the Board of Governors of the Federal Reserve System; or whoever with intent to defraud the United States or any agency thereof, or any financial institution referred to in this section, participates or shares in or receives (directly or indirectly) any money, profit, property, or benefits through any transaction, loan, commission, contract, or any other act of any such financial institution shall be fined not more than $1,000,000 or imprisoned not more than 30 years, or both."

The term "such bank" in section 1005 (Mail Fraud Act, 1994e) is defined in the rest of the section:

> "As used in this section, the term "national bank" is synonymous with "national banking association"; "member bank" means and includes any national bank, state

bank, or bank or trust company, which has become a member of one of the Federal Reserve banks; "insured bank" includes any state bank, banking association, trust company, savings bank, or other banking institution, the deposits of which are insured by the Federal Deposit Insurance Corporation; and the term "branch or agency of a foreign bank" means a branch or agency described in section 20(9) of this title. For purposes of this section, the term "depository institution holding company" has the meaning given such term in section 3(w)(1) of the Federal Deposit Insurance Act."

Section 1006 (Mail Fraud Act, 1994f) also provides:

"Whoever, being an officer, agent or employee of or connected in any capacity with the Federal Deposit Insurance Corporation, National Credit Union Administration, any Federal home loan bank, the Federal Housing Finance Agency, Farm Credit Administration, Department of Housing and Urban Development, Federal Crop Insurance Corporation, the Secretary of Agriculture acting through the Farmers Home Administration or successor agency, the Rural Development Administration or successor agency, or the Farm Credit System Insurance Corporation, a Farm Credit Bank, a bank for cooperatives or any lending, mortgage, insurance, credit or savings and loan corporation or association authorized or acting under the laws of the United States or any institution, other than an insured bank (as defined in section 656), the accounts of which are insured by the Federal Deposit Insurance Corporation, or by the National Credit Union Administration Board or any small business investment company, with intent to defraud any such institution or any other company, body politic or corporate, or any individual, or to deceive any officer, auditor, examiner or agent of any such institution or of department or agency of the United States, makes any false entry in any book, report or statement of or to any such institution, or without being duly authorized, draws any order or bill of exchange, makes any acceptance, or issues, puts forth or assigns any note, debenture, bond or other obligation, or draft, bill of exchange, mortgage, judgment, or decree, or, with intent to defraud the United States or any agency thereof, or any corporation, institution, or association referred to in this section, participates or shares in or receives directly or indirectly

> any money, profit, property, or benefits through any transaction, loan, commission, contract, or any other act of any such corporation, institution, or association, shall be fined not more than $1,000,000 or imprisoned not more than 30 years, or both."

Section 1005 covers national banks and member state banking institutions (Federal Reserve member banks) and banks, savings associations, certain foreign bank branches and depository institution holding companies (FDIC-insured banking institutions). On the other hand, Section 1006 of Title 18 covers federal credit institutions.

The section 1001 that are mentioned above clearly states that the defendant who concealed a fact by trick acted knowingly and wilfully. The fact that is concealed by the defendant was material. The Section 1005 points out that the defendant made a false entry, organised a false report or statement to defraud a bank. The section 1006 shows that the individual who was an officer, agent, or employee of the institution and made the entry, knowingly and wilfully made, or caused to be made, the false entry and targeted the institution or any of its officers, auditors, examiners or agents to defraud the institution.

6. Misapplication of funds; embezzlement

Sections 656 and 657 of Title 18 cover misapplication of individuals who represent federal lending institutions. The sections amended in 1989, 1990, 1994, and 1996.

Section 656 (Mail Fraud Act, 1994g) provides:

> "Whoever, being an officer, director, agent, or employee of, or connected in any capacity with any Federal Reserve bank, member bank, depository institution holding company, national bank, insured bank … embezzles, abstracts, purloins or wilfully misapplies any of the moneys, funds, credits of such bank, branch, agency, or organization or holding company or any moneys, funds, assets or securities intrusted to the custody or care of such bank, branch, agency, or organization, or holding company or to the custody or care of such agent, officer, director, employee, or receiver, shall be fined not more than $1,000,000 or

imprisoned not more than 30 years, or both: but if the amount embezzled, abstracted, purloined or misapplied does not exceed $1,000, he shall be fined under this title or imprisoned not more than one year, or both."

Section 657 (Mail Fraud Act, 1994h) also provides:

> "Whoever, being an officer, agent or employee of or connected in any capacity with the Federal Deposit Insurance Corporation, National Credit Union Administration, any Federal home loan bank, the Federal Housing Finance Agency, Farm Credit Administration, Department of Housing and Urban Development, Federal Crop Insurance Corporation, the Secretary of Agriculture acting through the Farmers Home Administration or successor agency, the Rural Development Administration or successor agency, or the Farm Credit System Insurance Corporation, a Farm Credit Bank, a bank for cooperatives or any lending, mortgage, insurance, credit or savings and loan corporation or association authorised or acting under the laws of the United States or any institution, other than an insured bank (as defined in Section 656), the accounts of which are insured by the Federal Deposit Insurance Corporation, or by the National Credit Union Administration Board or any small assistance under the Riegle Community Development and Regulatory Improvement Act of 1994, and whoever, being a receiver of any such institution, or agent or employee of the receiver, embezzles, abstracts, purloins or wilfully misapplies any moneys, funds, credits, securities or other things of value belonging to such institution, or pledged or otherwise intrusted to its care, shall be fined not more than $1,000,000 or imprisoned not more than 30 years, or both; but if the amount or value embezzled, abstracted, purloined or misapplied does not exceed $1,000, he shall be fined under this title or imprisoned not more than one year, or both."

The sections 656 and 657 state that the defendant is an officer, director, agent or employee of or connected with a banking institution that is linked to the Federal Reserve System or covered by the federal insurance system. The money and funds of the banking institution are wilfully misapplied by the accused; the purpose of the defendant is to injure or defraud the banking system. With the term "connected in any capacity with", the lawmaker wants

to keep federal banks and insured lenders free from fraud. Another point is the coverage of the language; the sections point out “any capacity” within the institution.

7. Overvaluation

The section 1014 of Title 18 (as amended in 1996, 1999, 2001, 2008, 2009 and 2010) (Mail Fraud Act, 1994i) explains the overvaluation of any property of the insured financial institution with the purpose of influence and defraud.

> “Whoever knowingly makes any false statement or report, or wilfully overvalues any land, property or security, for the purpose of influencing in any way the action of the Federal Housing Administration, the Farm Credit Administration, Federal Crop Insurance Corporation or a company the Corporation reinsures, the Secretary of Agriculture acting through the Farmers Home Administration or successor agency, the Rural Development Administration or successor agency, any Farm Credit Bank, production credit association, agricultural credit association, bank for cooperatives, or any division, officer, or employee thereof, or of any regional agricultural credit corporation established pursuant to law, or a Federal land bank, a Federal land bank association, a Federal Reserve bank, a small business investment company, as defined in section 103 of the Small Business Investment Act of 1958 (15 U.S.C. 662), or the Small Business Administration in connection with any provision of that Act, a Federal credit union, an insured State-chartered credit union, any institution the accounts of which are insured by the Federal Deposit Insurance Corporation, any Federal home loan bank, the Federal Housing Finance Agency, the Federal Deposit Insurance Corporation, the Farm Credit System Insurance Corporation, or the National Credit Union Administration Board, a branch or agency of a foreign bank (as such terms are defined in paragraphs (1) and (3) of section 1(b) of the International Banking Act of 1978), an organization operating under section 25 or section 25(a) of the Federal Reserve Act, or a mortgage lending business, or any person or entity that makes in whole or in part a federally related mortgage loan as defined in section 3 of the Real Estate Settlement Procedures Act of 1974, upon any application, advance, discount, purchase, purchase agreement, repurchase

> agreement, commitment, loan, or insurance agreement or application for insurance or a guarantee, or any change or extension of any of the same, by renewal, deferment of action or otherwise, or the acceptance, release, or substitution of security therefor, shall be fined not more than $1,000,000 or imprisoned not more than 30 years, or both. The term "State-chartered credit union" includes a credit union chartered under the laws of a State of the United States, the District of Columbia, or any commonwealth, territory, or possession of the United States."

The section 1014 states that the defendant knowingly and wilfully overvalued property to influence a federally insured financial institution. The key elements of the overvaluation are the actions of defendant "with knowledge" and "material" overvaluation. The material overvaluation depends on the ownership. The intent of the defendant is used to determine whether the defendant influenced the financial institution with knowledge. The property must belong to the institution; a false claim of ownership is not an overvaluation.

8. RICO

The Racketeer Influenced and Corrupt Organizations (RICO) Act is about the prohibition of investments and operations in a bank through racketeering activity or the collection of unlawful debt. It is briefly prohibition of the collection of banking crimes that are collected by federal authorities in the recent years. The penalties linked to the provisions of RICO are ordered in section 1963 of Title 18.

Section 1963 (Mail Fraud Act, 1994j) provides:

> "Whoever violates any provision of Section 1962 of this chapter shall be fined under this title or imprisoned not more than twenty years (or for life it violation is based on a racketeering activity for which the maximum penalty includes life imprisonment), or both, and shall forfeit to the United States, irrespective of any provision of State law-

(1) any interest the person has acquired or maintained in violation of Section 1962;

(2) any-

(A) interest in;

(B) security of;

(C) claim against; or

(D) property or contractual right of any kind affording a source of influence over:

any enterprise which the person has established, operated, controlled, conducted, or participated in the conduct of in violation of Section 1962; and

(3) any property constituting, or derived from, any proceeds which the person obtained, directly or indirectly, from racketeering activity or unlawful debt collection in violation of Section 1962."

The court, in imposing sentence on such person shall order, in addition to any other sentence imposed pursuant to this section that the person forfeits to the United States all property described in this subsection. Instead of a fine otherwise authorised by this section, a defendant who derives profits or other proceeds from an offence may be fined not more than twice the gross profits or other proceeds.

The income derived from racketeering activity or collection of an unlawful debt are defined in section 1962. According to RICO act, using of such income to acquire or invest in an enterprise is prohibited.

9. Bank Bribery

Section 215 of Title 18 covers bribe takers and bribe givers in the financial institutions. The Act which was amended in 1984 to include any banks, which are insured by the FDIC, became effective in 1986 and amended in 1989, 1990, 1994, and 1996.

Section 215 (Mail Fraud Act, 1994k) provides:

> "Whoever corruptly gives, offers, or promises anything of value to any person, with intent to influence or reward an officer, director, employee, agent, or attorney of a financial institution in connection with any business or transaction of such institution; or as an officer, director, employee, agent, or attorney of a financial institution, corruptly solicits or demands for the benefit of any person, or corruptly accepts or agrees to accept, anything of value from any person, intending to be influenced or rewarded in connection with any business or transaction of such institution; shall be fined not more than $1,000,000 or three times the value of the thing given, offered, promised, solicited, demanded, accepted, or agreed to be accepted, whichever is greater, or imprisoned not more than 30 years, or both, but if the value of the thing given, offered, promise, solicited, demanded, accepted, or agreed to be accepted does not exceed $1,000, shall be fined under this title or imprisoned not more than one year, or both."

Under this condition, it is clear that an individual, who offers bribe intends to influence and rewards, makes or promises any payment to the person who is an officer, director, employee, agent or attorney of a financial institution. On the other hand, it is also evident that an officer, director, employee, agent, or attorney of a financial institution who takes bribe demands, accepts or agrees to accept the bribe for himself or another person. This section broadens the affiliates with mentioning agent and attorney at any capacity.

10. Mail fraud and wire fraud

Sections 1341 and 1343 of Title 18 cover mail and wire fraud, respectively.

Section 1341 (Mail Fraud Act, 1994l) states:

> "Whoever, having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretences, representations, or promises, or to sell, dispose of, loan, exchange, alter, give away, distribute, supply, or furnish or procure for unlawful use any counterfeit or spurious coin, obligation, security, or other article, or anything represented to be or intimated or held out to be such counterfeit or spurious article,

for the purpose of executing such scheme or artifice or attempting so to do, places in any post office or authorized depository for mail matter, any matter or thing whatever to be sent or delivered by the Postal Service, or deposits or causes to be deposited any matter or thing whatever to be sent or delivered by any private or commercial interstate carrier, or takes or receives therefrom, any such matter or thing, or knowingly causes to be delivered by mail or such carrier according to the direction thereon, or at the place at which it is directed to be delivered by the person to whom it is addressed, any such matter or thing, shall be fined under this title or imprisoned not more than 20 years, or both. If the violation occurs in relation to, or involving any benefit authorized, transported, transmitted, transferred, disbursed, or paid in connection with, a presidentially declared major disaster or emergency (as those terms are defined in section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122)), or affects a financial institution, such person shall be fined not more than $1,000,000 or imprisoned not more than 30 years, or both."

The section 1343 (as amended in 1994, 2002 and 2008) (Mail Fraud Act, 1994m) addresses wire fraud:

"Whoever, having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretences, representations, or promises, transmits or causes to be transmitted by means of wire, radio, or television communication in interstate or foreign commerce, any writings, signs, signals, pictures, or sounds for the purpose of executing such scheme or artifice, shall be fined under this title or imprisoned not more than 20 years, or both. If the violation occurs in relation to, or involving any benefit authorized, transported, transmitted, transferred, disbursed, or paid in connection with, a presidentially declared major disaster or emergency (as those terms are defined in section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122)), or affects a financial institution, such person shall be fined not more than $1,000,000 or imprisoned not more than 30 years, or both."

The definition of violation is similar in both of these sections. The defendant intended to defraud with the use or mails or wires, which are the maintenance of a fraudulent scheme. The point of this is not related to the success of the scheme and the suffer from the victims; the attempt is accepted as the fraud by common law concepts and as the violation of federal law when the fraud is material.

Appendix D: List of Fraud Sample Banks

Table 57: List of fraud sample banks.

Name	Latest Annual Report Date	Total Assets ($000) (as of 31/12/2015)
ABN AMRO GROUP NV	November 2015	423,935,049
ABSECON BANCORP	December 2015	151,778
AGEAS	December 2015	113,485,174
ALLIED IRISH BANKS PLC	December 2015	115,241,930
ALLY FINANCIAL INC	December 2014	158,581,000
AMCORE FINANCIAL INC*	May 2010	
AMERICAN EXPRESS CO	December 2014	161,184,000
AMERICAN INTERNATIONAL GROUP (AIG) INC	December 2014	496,842,000
AMERICAN RIVER BANKSHARES	December 2014	634,640
AMERICANWEST BANCORP*	March 2010	
AMES NATIONAL CORP	December 2014	1,326,747
AMSOUTH BANCORP*	November 2006	
ANCHOR BANCORP WISCONSIN INC	November 2011	2,248,498
APPALACHIAN BANCSHARES INC*	October 2009	
ASSOCIATED BANC-CORP	December 2015	27,711,835
ATLANTIC BANCGROUP INC*	November 2010	
ATLANTIC SOUTHERN FINANCIAL GROUP INC*	January 2011	
BANCO ESPIRITO SANTO SA*	February 2014	
BANCO SANTANDER SA	December 2014	1,455,698,637
BANCORP INC	December 2014	4,765,823
BANCORPSOUTH INC	December 2015	13,798,662
BANK OF AMERICA CORP	December 2015	2,144,316,000
BANK OF MONTREAL (BMO)	October 2015	490,884,827
BANK OF NEW YORK MELLON CORP	December 2015	393,780,000
BANK OF NOVA SCOTIA	October 2015	655,014,530
BANK OF THE OZARKS INC	December 2014	9,879,459
BANK ONE CORP*	July 2004	
BANKUNITED FINANCIAL CORP*	June 2009	
BANNER CORP	December 2015	9,796,298
BARCLAYS PLC	December 2015	1,650,717,760
BAY NATIONAL CORP*	June 2010	
BAYLAKE CORP	November 2013	1,093,917
BBCN BANCORP INC	December 2014	7,912,648
BBVA - BANCO BILBAO VIZCAYA ARGENTARIA SA	December 2015	838,259,253
BBX CAPITAL CORP	December 2014	393,505
BCSB BANCORP INC*	February 2014	
BEACH FIRST NATIONAL BANCSHARES INC*	April 2010	
BERKSHIRE HILLS BANCORP INC	December 2014	7,831,086
BEVERLY HILLS BANCORP INC*	February 2009	
BLUE VALLEY BAN CORP	December 2014	638,245
BNC BANCORP	December 2014	5,666,956
BNP PARIBAS	December 2014	2,165,953,079
BOK FINANCIAL CORP	December 2014	31,476,128
BROOKLINE BANCORP INC	December 2015	6,042,338
BSB BANCORP INC	December 2014	1,812,916
CANADIAN IMPERIAL BANK OF COMMERCE (CIBC)	October 2015	354,320,128
CAPE BANCORP INC	December 2014	1,601,985
CAPE FEAR BANK CORP*	April 2009	
CAPITAL CITY BANK GROUP INC	December 2014	2,797,860

CAPITAL CORP OF THE WEST*	February 2009	
CAPITAL ONE FINANCIAL CORP	December 2014	334,048,000
CAPITALSOUTH BANCORP*	March 2009	
CAPITOL BANCORP LTD*	January 2011	
CARLILE BANCSHARES INC	December 2015	2,270,108
CASCADE BANCORP	December 2014	2,468,029
CASCADE FINANCIAL CORP*	June 2011	
CATHAY GENERAL BANCORP	December 2014	13,254,126
CCF HOLDING CO	March 2009	393,497
CECIL BANCORP INC	December 2012	271,197
CENTRAL PACIFIC FINANCIAL CORP	December 2015	5,131,288
CENTRAL VALLEY COMMUNITY BANCORP	December 2014	1,276,736
CFS BANCORP INC*	November 2013	
CHEMICAL FINANCIAL CORP	December 2014	9,188,797
CHINO COMMERCIAL BANCORP	December 2014	161,384
CHOICE BANCORP INC	December 2011	277,767
CIT GROUP INC	December 2014	67,401,500
CITIGROUP INC	December 2015	1,731,210,000
CITIZENS COMMUNITY BANCORP INC	September 2015	581,770
CITIZENS FINANCIAL GROUP INC	December 2015	138,208,000
CITIZENS HOLDING CO (MS)	December 2015	973,505
CITIZENS REPUBLIC BANCORP INC*	April 2013	
CITY HOLDING CO	December 2015	3,714,059
CITY NATIONAL CORP*	November 2015	
CIVITAS BANKGROUP INC*	May 2007	
COAST FINANCIAL HOLDINGS INC*	December 2007	
COASTAL BANKING COMPANY INC	December 2014	464,667
COLONIAL BANCGROUP INC*	August 2009	
COMERICA INC	December 2014	71,877,000
COMMERCE BANCORP INC*	March 2008	
COMMERZBANK AG	December 2014	578,517,432
COMMONWEALTH BANKSHARES INC (VIRGINIA)*	October 2011	
COMMUNITY CAPITAL BANCSHARES INC	December 2006	144,934
COMMUNITY CAPITAL CORP*	October 2011	
COMMUNITY FINANCIAL SHARES INC*	July 2015	
COMMUNITY SHORES BANK CORP	December 2010	181,021
COMMUNITY VALLEY BANCORP*	September 2009	
COMMUNITY WEST BANCSHARES	December 2014	621,213
COMMUNITYONE BANCORP	December 2014	2,397,265
COOPERATIVE BANKSHARES INC*	July 2009	
CORDIA BANCORP INC	December 2014	348,490
CORNERSTONE BANCORP*	December 2011	
CORUS BANKSHARES INC*	September 2009	
COUNTY BANCORP INC	January 2015	884,889
CREDIT AGRICOLE SA	December 2014	1,661,012,273
CREDIT SUISSE GROUP AG	December 2014	819,739,339
CSB BANCORP INC (OH)	December 2015	650,314
CVB FINANCIAL CORP	December 2014	7,671,200
DCB FINANCIAL CORP	December 2014	541,264
DEARBORN BANCORP INC*	November 2011	
DEUTSCHE BANK AG	December 2014	1,769,447,160
DEXIA SA	December 2014	250,115,130
DIMECO INC	December 2014	613,352
DISCOVER FINANCIAL SERVICES INC	December 2014	86,799,000
DOWNEY FINANCIAL CORP*	November 2008	
DRESDNER KLEINWORT*	September 2009	
E*TRADE FINANCIAL CORP	December 2014	45,427,000
EAST WEST BANCORP INC	December 2014	32,350,922

EASTERN VIRGINIA BANKSHARES INC	December 2014	1,270,384
ENTERPRISE BANCORP INC	December 2014	2,285,531
ENTERPRISE FINANCIAL SERVICES CORP	December 2014	3,608,483
ESB FINANCIAL CORP*	February 2015	
EVERBANK FINANCIAL CORP	December 2014	26,601,026
F&M BANK CORP	December 2014	665,357
FARMERS CAPITAL BANK CORP	December 2014	1,775,950
FENTURA FINANCIAL INC	December 2014	446,402
FFD FINANCIAL CORP	June 2012	278,109
FIFTH THIRD BANCORP	December 2015	141,048,000
FINANCIAL INSTITUTIONS INC	December 2014	3,381,024
FIRST BANKS INC*	December 2014	
FIRST BUSEY CORP	December 2014	3,998,976
FIRST BUSINESS FINANCIAL SERVICES INC	December 2014	1,782,081
FIRST CITIZENS BANCSHARES INC (NC)	December 2014	31,475,934
FIRST CLOVER LEAF FINANCIAL CORP	December 2014	654,874
FIRST COMMUNITY BANCSHARES INC	December 2015	2,462,276
FIRST COMMUNITY CORP	December 2014	862,734
FIRST FINANCIAL BANCORP	December 2014	8,147,411
FIRST FINANCIAL CORP IND	December 2015	2,979,585
FIRST HORIZON NATIONAL CORP	December 2014	26,192,637
FIRST INTERNET BANCORP	December 2015	1,269,870
FIRST INTERSTATE BANCSYSTEM INC	December 2014	8,728,196
FIRST M & F CORP*	September 2013	
FIRST MARINER BANCORP INC*	September 2011	
FIRST MERCHANTS CORPORATION	December 2014	6,761,003
FIRST MIDWEST BANCORP INC	December 2014	9,732,676
FIRST NATIONAL BANCSHARES INC*	July 2010	
FIRST NATIONAL COMMUNITY BANCORP INC	December 2014	1,090,618
FIRST NIAGARA FINANCIAL GROUP INC	December 2014	39,918,386
FIRST PLACE FINANCIAL CORP OHIO*	November 2011	
FIRST REGIONAL BANCORP*	February 2010	
FIRST SECURITY GROUP INC*	November 2015	
FIRST STATE BANCORP*	July 2010	
FIRST WEST VIRGINIA BANCORP INC	November 2015	345,394
FIRSTFED FINANCIAL CORP*	March 2009	
FIRSTMERIT CORP	December 2014	25,524,604
FLAGSTAR BANCORP INC	December 2014	13,715,000
FLEET BOSTON FINANCIAL CORP*	April 2004	
FNB CORPORATION	December 2015	17,557,662
FNBH BANCORP INC	December 2014	348,169
FOUR OAKS FINCORP INC	December 2014	691,387
FOX CHASE BANCORP INC	December 2014	1,125,603
FRONTIER FINANCIAL CORP*	May 2010	
FS BANCORP INC	December 2014	677,561
FULTON FINANCIAL CORPORATION	December 2014	17,914,718
GERMAN AMERICAN BANCORP INC	December 2014	2,373,701
GOLDMAN SACHS GROUP INC	December 2014	861,395,000
GREAT LAKES BANCORP INC*	February 2008	
GREAT SOUTHERN BANCORP INC	December 2014	4,104,189
GREAT WESTERN BANCORP INC	September 2015	9,957,215
GREEN BANKSHARES INC*	September 2012	
GREEN DOT CORP	December 2015	1,691,448
GREER BANCSHARES INC	December 2013	376,357
GUARANTY BANCORP	December 2015	2,368,525
HAMILTON BANCORP INC (MD)	March 2015	368,257
HAMPTON ROADS BANKSHARES INC	December 2014	2,065,940
HANMI FINANCIAL CORP	December 2014	4,234,521

HARLEYSVILLE NATIONAL CORP*	April 2010	
HARLEYSVILLE SAVINGS FINANCIAL CORP	December 2012	773,706
HAWTHORN BANCSHARES INC	December 2014	1,200,921
HEARTLAND FINANCIAL USA INC	December 2014	7,694,754
HERITAGE COMMERCE CORP	December 2014	2,361,579
HERITAGE OAKS BANCORP	December 2014	1,899,739
HF FINANCIAL CORP	June 2015	1,171,885
HIGH POINT BANK CORP	December 2014	851,024
HOPFED BANCORP INC	December 2015	903,154
HSBC HOLDINGS PLC	December 2015	2,409,656,000
HSH NORDBANK AG	December 2014	105,325,296
HUDSON VALLEY HOLDING CORP*	June 2015	
HUNTINGTON BANCSHARES INC	December 2015	71,018,301
IMPERIAL CAPITAL BANCORP INC*	December 2008	
INDEPENDENCE BANCSHARES INC	December 2015	97,467
INDEPENDENT BANK CORP	December 2014	7,209,469
INDEPENDENT BANK CORP MICHIGAN	December 2014	2,409,066
INDIANA COMMUNITY BANCORP*	September 2012	
INTEGRA BANK CORP*	May 2011	
INTERNATIONAL BANCSHARES CORP	December 2014	11,772,869
INTERVEST BANCSHARES CORP*	February 2015	
INTESA SANPAOLO SPA	December 2014	734,762,681
INVESTORS FINANCIAL SERVICES CORP*	July 2007	
IRWIN FINANCIAL CORP*	September 2009	
JEFFERSONVILLE BANCORP	June 2012	459,666
JPMORGAN CHASE & CO	December 2014	2,351,698,000
KENTUCKY BANCSHARES INC	December 2014	974,684
KEYCORP	December 2014	95,131,000
LEGACYTEXAS FINANCIAL GROUP INC	December 2014	7,691,940
LEHMAN BROTHERS HOLDINGS INC*	September 2008	
LLOYDS BANKING GROUP PLC	December 2015	1,188,928,519
M&T BANK CORP	December 2015	122,787,884
MACATAWA BANK CORP	December 2014	1,729,643
MAGYAR BANCORP INC	September 2015	571,513
MAINSOURCE FINANCIAL GROUP	December 2014	3,385,408
MALVERN BANCORP INC	September 2015	727,148
MANASOTA GROUP INC*	December 2012	
MBNA CORP*	December 2005	
MBT FINANCIAL CORP	December 2014	1,342,313
MERCANTILE BANCORP INC ILL*	December 2011	
MERIDIAN BANCORP INC	December 2014	3,524,509
META FINANCIAL GROUP INC	September 2015	2,960,234
METLIFE INC	December 2014	877,933,000
METRO BANCORP INC	February 2016	2,905,373
METROCORP BANCSHARES INC*	January 2014	
MID PENN BANCORP INC	December 2014	931,638
MIDDLEFIELD BANC CORP	December 2014	735,139
MIDWEST BANC HOLDINGS INC*	May 2010	
MILLENNIUM BANKSHARES CORP*	December 2008	
MONARCH COMMUNITY BANCORP INC*	September 2012	
MONARCH FINANCIAL HOLDINGS INC	December 2014	1,161,448
MORGAN STANLEY	December 2014	787,465,000
NATIONAL BANKSHARES INC	December 2015	1,199,739
NATIONAL CITY CORP*	December 2008	
NEW YORK COMMUNITY BANCORP INC	December 2014	50,317,796
NEXITY FINANCIAL CORP*	February 2009	
NORTH VALLEY BANCORP*	October 2014	
NORTHERN STATES FINANCIAL CORP	February 2012	485,347

NORTHERN TRUST CORP	December 2015	116,749,600
OHIO LEGACY CORP	October 2012	321,444
OHIO VALLEY BANC CORP	December 2014	796,285
OLD NATIONAL BANCORP (INDIANA)	December 2015	11,991,527
OLD SECOND BANCORP INC	December 2014	2,077,028
OMEGA FINANCIAL CORP*	April 2008	
OMNI FINANCIAL SERVICES INC*	July 2008	
OPTIMUMBANK HOLDINGS INC	December 2014	127,478
ORRSTOWN FINANCIAL SERVICES INC	December 2014	1,292,816
PAB BANKSHARES INC*	May 2011	
PACIFIC CAPITAL BANCORP*	December 2012	
PACIFIC CONTINENTAL CORP	December 2014	1,909,478
PACIFIC PREMIER BANCORP INC	December 2014	2,790,646
PACIFIC STATE BANCORP*	May 2010	
PARK NATIONAL CORP	December 2014	7,311,354
PARKE BANCORP INC	December 2014	885,124
PATRIOT NATIONAL BANCORP INC	December 2014	653,531
PELICAN FINANCIAL INC*	April 2006	
PENNS WOODS BANCORP INC	December 2014	1,320,057
PEOPLES BANCORP OF NORTH CAROLINA INC	December 2015	1,038,481
PEOPLES BANCORPORATION INC*	April 2012	
PEOPLES COMMUNITY BANCORP INC*	August 2009	
PEOPLE'S UNITED FINANCIAL INC	December 2015	38,946,700
PLUMAS BANCORP	December 2014	599,286
PNC FINANCIAL SERVICES GROUP INC	December 2015	358,493,000
PORTER BANCORP INC	December 2014	948,722
PORTIGON AG*	December 2014	
PREMIER FINANCIAL BANCORP INC	December 2014	1,244,693
PREMIERWEST BANCORP INC*	April 2013	
PRINCETON NATIONAL BANCORP INC*	June 2012	
PRIVATEBANCORP INC	December 2014	17,252,848
PROVIDENT COMMUNITY BANCSHARES INC*	November 2011	
PROVIDENT FINANCIAL SERVICES INC	December 2015	8,911,657
PRUDENTIAL FINANCIAL INC	December 2014	757,255,000
PSB HOLDINGS INC (WIS)	December 2014	784,410
PVF CAPITAL CORP*	October 2013	
RABOBANK NEDERLAND*	December 2014	
RAYMOND JAMES FINANCIAL INC	September 2015	26,907,327
REGIONS FINANCIAL CORP	December 2015	126,050,000
REPUBLIC BANCORP INC (KY)	December 2015	4,230,289
RIVERVIEW BANCORP INC	March 2015	886,152
ROYAL BANCSHARES OF PENNSYLVANIA INC	December 2015	788,283
ROYAL BANK OF SCOTLAND GROUP PLC	December 2015	1,201,780,398
SANTA LUCIA BANCORP*	October 2011	
SB FINANCIAL GROUP INC	December 2015	733,071
SEACOAST BANKING CORP OF FLORIDA	December 2014	3,534,780
SHORE BANCSHARES INC	December 2014	1,135,143
SIMMONS FIRST NATIONAL CORP	December 2015	7,559,658
SKANDINAVISKA ENSKILDA BANKEN (SEB) AB	December 2014	295,933,699
SMITHTOWN BANCORP INC*	December 2010	
SOCIETE GENERALE SA	December 2015	1,449,322,255
SOLERA NATIONAL BANCORP INC	December 2013	146,073
SOUTHERN COMMUNITY FINANCIAL CORP*	October 2012	
SOUTHERN FIRST BANCSHARES INC	December 2014	1,217,293
SOUTHWEST BANCORP INC	December 2014	2,357,022
STANDARD CHARTERED PLC	December 2015	694,960,000
STATE STREET CORP	December 2014	245,155,000
STELLARONE CORP*	January 2014	

STERLING BANKS INC*	July 2010	
STERLING FINANCIAL CORP (WASH)*	April 2014	
STIFEL FINANCIAL CORP	December 2014	13,326,051
STOCK YARDS BANCORP INC	December 2014	2,816,801
SUFFOLK BANCORP	December 2014	2,168,592
SUN AMERICAN BANCORP*	December 2009	
SUN BANCORP INC NEW JERSEY	December 2014	2,210,584
SUNTRUST BANKS INC	December 2015	190,817,000
SYNOVUS FINANCIAL CORP	December 2015	28,792,653
T BANCSHARES INC	December 2014	176,929
TAMALPAIS BANCORP*	April 2010	
TAYLOR CAPITAL GROUP INC*	August 2014	
TCF FINANCIAL CORP	December 2014	20,689,609
TEAM FINANCIAL INC*	March 2009	
TEMECULA VALLEY BANCORP INC*	July 2009	
TENNESSEE COMMERCE BANCORP INC*	February 2012	
TIB FINANCIAL CORP*	September 2012	
TIDELANDS BANCSHARES INC	June 2011	466,235
TIERONE CORP*	May 2010	
TOMPKINS FINANCIAL CORP	December 2014	5,689,995
TORONTO-DOMINION BANK	October 2015	844,580,147
TOWER FINANCIAL CORP*	April 2014	
TRUSTCO BANK CORP NY	December 2014	4,734,992
TRUSTMARK CORP	December 2015	12,678,896
UBS GROUP AG	December 2014	941,594,927
UCBH HOLDINGS INC*	November 2009	
UMPQUA HOLDINGS CORP	December 2015	23,406,381
UNION BANKSHARES CORP	December 2014	7,693,291
UNION NATIONAL FINANCIAL CORP (PA)*	May 2011	
UNITED BANCORP INC OHIO	December 2015	405,124
UNITED BANCSHARES INC (PENNSYLVANIA)	December 2014	608,665
UNITED BANKSHARES INC	December 2014	12,577,944
UNITED COMMUNITY FINANCIAL CORP	December 2015	1,987,989
UNITED SECURITY BANCSHARES	December 2014	725,644
UNITY BANCORP INC	December 2014	1,084,866
UNIVERSITY BANCORP INC	January 2009	182,459
US BANCORP	December 2015	421,853,000
VALLEY FINANCIAL CORP*	July 2015	
VILLAGE BANK AND TRUST FINANCIAL CORP	December 2014	419,941
VINEYARD NATIONAL BANCORP*	April 2009	
WACCAMAW BANKSHARES INC*	November 2011	
WACHOVIA CORP*	December 2008	
WASHINGTON FEDERAL INC	September 2015	14,684,899
WASHINGTON MUTUAL INC*	September 2008	
WEBSTER FINANCIAL CORP	December 2015	24,642,887
WELLS FARGO & CO	December 2015	1,787,632,000
WEST BANCORPORATION INC	December 2015	1,748,396
WEST COAST BANCORP OR*	April 2013	
WGNB CORP*	September 2009	
WHITNEY HOLDING CORP*	June 2011	
WILBER CORP*	April 2011	
WILMINGTON TRUST CORP*	May 2011	
WILSHIRE BANCORP INC	December 2014	4,713,468
WSB FINANCIAL GROUP INC*	May 2009	
XENITH BANKSHARES INC	December 2014	1,039,496
ZIONS BANCORP	December 2014	59,664,543

* denotes inactive banks
Source: SNL Financial

Appendix E: Enforcement Action Types

Civil money penalty refers to the dollar amount of fine that banking organisations are subject to pay in any case of violation of any law or regulation, any final or temporary order, and any written agreement with the regulator. To illustrate, in 2015, the OCC issued a civil money penalty against Wells Fargo Bank, National Association. The OCC (2015, pp. 5–7):

> "Since August 2005, the Bank has marketed and sold Credit Defense Platinum, a debt cancellation product, to Bank credit card customers. Credit Defense Platinum includes cancellation of some or all of a customer's credit card balance upon the occurrence of certain qualifying events. The Bank's debt cancellation product vendor is responsible for approving and directing payment of such benefits. When benefits are approved, credit card payments are not cancelled. Rather, the customer continues to be billed monthly, and the debt cancellation product vendor directs payment of the Credit Defense Platinum benefit to cover all or a portion of the credit card's minimum payment due. From August 2005 through November 2013, the debt cancellation product vendor directed recurring Credit Defense Platinum benefit payments to post on the same day of each month without regard to when customers' monthly payments were due. As a result, some Bank credit card customers were charged recurring late fees because the day on which the vendor directed recurring benefit payments to post was later in the billing cycle than the day on which those customers' payments were due. Pursuant to the authority vested in him by the Federal Deposit Insurance Act, 12 U.S.C. § 1818(i), the Comptroller orders, and the Bank consents to the following: (1) The Bank shall make payment of a civil money penalty in the total amount of four million dollars ($4,000,000), which shall be paid upon the execution of this Order: (a) If a check is the selected method of payment, the check shall be made payable to the Treasurer of the United States and shall be delivered to: Comptroller of the Currency, P.O. Box 979012, St. Louis, Missouri 63197-9000. (b) If a wire transfer is the selected method of payment, it shall be sent in accordance with instructions provided by the Comptroller."

Cease and Desist Order is a measure assigned by the regulator to the bank in order to repair unsafe and unsound banking practice. Cease and desist order has a unilateral characteristic that refers to the responsibility of bank. For instance, in 2009, the FDIC issued cease and desist order against the Bank of the Cascades. The FDIC states (2009, pp. 4–6):

> "(a) Within 150 days from the effective date of this ORDER, the Bank shall increase and thereafter maintain Tier 1 capital in such an amount as to equal or exceed 10 percent of the Bank's total assets ("Leverage Capital Ratio"). (b) Within 60 days from the effective date of this ORDER, the Bank shall develop and adopt a plan to meet and thereafter maintain the minimum risk-based capital requirements for a "Well Capitalized" bank as described in the FDIC's Statement of Policy on Risk-Based Capital contained in Appendix A to Part 325 of the FDIC's Rules and Regulations, 12 C.F.R. Part 325, Appendix A. The Plan shall be in a form and manner acceptable to the Regional Director and Administrator as determined at subsequent examinations and/or visitations. (c) The level of Tier 1 capital to be maintained during the life of this ORDER pursuant to Subparagraph 3(a) shall be in addition to a fully funded ALLL, the adequacy of which shall be satisfactory to the Regional Director and the Administrator as determined at subsequent examinations and/or visitations. (d) Any increase in Tier 1 capital necessary to meet the requirements of Paragraph 3(a) of this ORDER may be accomplished by the following: (i) the sale of common stock; or (ii) the sale of non-cumulative perpetual preferred stock; or (iii) the direct contribution of cash by the Bank's Board, shareholders, and/or parent holding company; or (iv) any other means acceptable to the Regional Director and the Administrator; or (v) any combination of the above means. Any increase in Tier 1 capital necessary to meet the requirements of Paragraph 3(a) of this ORDER may not be accomplished through a transfer from the Bank's ALLL, and the level of the Bank's ALLL shall be maintained at an appropriate level in accordance with Paragraph 4(a) of this ORDER."

Written agreement refers to the agreement between regulator and bank. In this agreement, the bank pledges to establish all corrective measures to adopt. In order to illustrate, in

2012, the FED reached a written agreement with North Valley Bancorp, the FED (2010, p. 2) states:

> "Within 45 days of this Agreement, the Bank shall submit to the Reserve Bank an acceptable written plan to strengthen the Bank's management of commercial real estate ("CRE") concentrations, including steps to reduce or mitigate the risk of concentrations. The plan shall be consistent with the Interagency Guidance on Concentrations in Commercial Real Estate Lending, Sound Risk Management Practices, dated December 12, 2006 (SR 07-1), and, at a minimum, address, consider, and include: (a) Continued reduction of concentration of credit risk tolerances or limits by types of loan products, geographic locations, and other common risk characteristics or sensitivities; (b) documented strategies to manage CRE concentration levels, including a contingency plan to reduce or mitigate concentrations; (c) enhanced monitoring and reporting of CRE concentrations to management and the board of directors; and (d) continued performance of strategic planning that considers CRE concentrations in relation to the Bank's planned growth, projected earnings, and capital plans and overall operations."

Orders of removal and/or prohibition refers to the regulatory power that allows to remove a present or former officer, director, manager, or employee of a bank, or prohibit a controlling shareholder from further actions. For example, in 2011, the OTS issued an order of removal against a manager of American Express Bank, FSB. The OTS (2011, pp. 2–3) states:

> "Crystal Green had been employed by the Association to work at an Association customer call center in Sunrise, Florida at all times pertinent to the events described herein. The OTS finds that in November 2009, Green fraudulently accessed customer account information and fraudulently disclosed private customer information, including customers' credit card numbers, which were used to conduct fraudulent credit card purchases totalling over twenty five thousand dollars ($25,000). Accordingly: (a) Green has, directly or indirectly, violated (as defined in 12 U.S.C. § 1813(v)) a law or regulation, and/or a final cease-and-desist order, and/or a condition imposed in writing by a Federal banking agency in

> connection with the grant of an application or other request by the Association, and/or any written agreement between the Association and the OTS; and/or engaged or participated in any unsafe or unsound practices in connection with the Association; and/or committed or engaged in any act, omission, or practice which constitutes a breach of her fiduciary duty; (b) and, by reason of such violation, practice, or breach by Green, the Association has suffered or will probably suffer financial loss or other damage; and/or the interests of the Association's depositors have been or could be prejudiced; and/or Green has received financial gain or other benefit by reason of such violation, practice, or breach; (c) and, such violation, unsafe or unsound practice, or breach by Green: involves personal dishonesty on the part of Green; and/or demonstrates wilful or continuing disregard by Green for the safety or soundness of the Association."

Consent order is a voluntary agreement among between regulator and bank and covers many fields of banking such as capital requirements, liquidity and fund management, deposits. Different than written agreement, consent order can be forced by the court. For instance, in 2010, the FDIC issued a consent order against Pilsen State Bank. The FDIC (2010, pp. 1–2) states:

> "The Bank, by and through its duly elected and acting Board of Directors ("Board"), has executed a "Stipulation to the Issuance of a Consent Order" ("Stipulation"), dated December 8, 2009, that is accepted by the FDIC and the KSBB. With the Stipulation, the Bank has consented, without admitting or denying any charges of unsafe or unsound banking practices or violations of law and/or regulation, to the issuance of this Consent Order ("Order") by the FDIC and the KSBB."

Prompt corrective action is a regulatory penalty against banks that have increasingly weakening capital ratios. To illustrate, in 2012, the FED issued a prompt corrective action against Premier Bank. The FED (2012, p. 2) states:

> "The Bank shall no later than 90 days of the date of this Directive (or such additional time as the Board of Governors may, with the concurrence of the

Federal Deposit Insurance Corporation (the "FDIC") permit), in conjunction with the Bank's parent bank holding company PB Financial Group, Inc., Denver, Colorado: (a) Increase the Bank's equity through the sale of shares or contributions to surplus in an amount sufficient to make the Bank adequately capitalized as defined in section 208.43(b)(2) of Regulation H of the Board of Governors (12 C.F.R. § 208.43(b)(2)); (b) enter into and close a contract to be acquired by a depository institution holding company or combine with another insured depository institution, closing under which contract is conditioned only on the receipt of necessary regulatory approvals, the continued accuracy of customary representations and warranties, and the performance of customary preclosing covenants; or (c) take other necessary measures to make the Bank adequately capitalized."

Appendix F: Results of Estimations for Repeated, Technical, and Non-technical Samples

Table 58: Probit estimates of the likelihood of a bank fraud in repeated sample.

This table reports probit model estimation results in repeated sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.0622***				0.0622***
		(0.007)				(0.007)
	CEO Ownership		0.0874***			0.0958***
			(0.026)			(0.026)
	CEO Duality			-0.0155		-0.0119
				(0.015)		(0.015)
	CEO Network Size				0.0262***	0.0267***
					(0.005)	(0.005)
CEO related	CEO Age	0.0524	0.1330**	0.1370**	0.1802***	0.1181**
		(0.055)	(0.054)	(0.055)	(0.055)	(0.057)
	CEO Gender	-0.0325	-0.0173	-0.0222	-0.0226	-0.0277
		(0.032)	(0.033)	(0.033)	(0.032)	(0.032)
	Experience	0.0260***	0.0251***	0.0265***	0.0268***	0.0256***
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
	Education	-0.0228	-0.0271*	-0.0246*	-0.0404***	-0.0416***
		(0.014)	(0.014)	(0.014)	(0.015)	(0.015)
Board related	Board Size	-0.0078***	-0.0083***	-0.0083***	-0.0093***	-0.0091***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Board Independence	-0.0122	-0.0147	-0.0212	-0.0203	-0.0237
		(0.057)	(0.058)	(0.058)	(0.058)	(0.058)
Bank specific	Leverage	0.0020***	0.0015**	0.0016**	0.0015**	0.0018**
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.0135**	0.0168***	0.0178***	0.0155***	0.0103*
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
	Liquidity	-0.0004	-0.0006	-0.0006	-0.0006	-0.0005
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.0743***	0.0726***	0.0727***	0.0666***	0.0702***
		(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
	Capital-Asset Ratio	-0.0120***	-0.0142***	-0.0136***	-0.0141***	-0.0127***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Cost-to-Income	0.0015***	0.0013***	0.0014***	0.0012***	0.0012***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Size	0.0908***	0.0818***	0.0917***	0.0810***	0.0740***
		(0.005)	(0.006)	(0.005)	(0.005)	(0.006)
	Financial Crisis	Yes	Yes	Yes	Yes	Yes
	Regulatory Effectiveness	Yes	Yes	Yes	Yes	Yes
	Dodd-Frank Dummy	Yes	Yes	Yes	Yes	Yes
	Observations	4302	4302	4302	4302	4302
	Log-likelihood	-1908.64	-1945.22	-1951.22	-1939.19	-1888.28
	Pruedo R2	0.1843	0.1686	0.1661	0.1712	0.1930

Table 59: Bivariate probit estimates of the likelihood of detecting bank fraud in repeated sample.

This table reports bivariate probit model estimation results in repeated sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of detecting fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud by employing fraud detecting variables. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.0605***				0.0533***
		(0.008)				(0.008)
	CEO Ownership		0.0517*			0.0454**
			(0.029)			(0.018)
	CEO Duality			-0.0301		0.0512*
				(0.024)		(0.027)
	CEO Network Size				0.0445***	0.0326***
					(0.008)	(0.006)
CEO related	CEO Age	-0.4082***	-0.2621**	-0.2993***	-0.1781**	-0.1637***
		(0.073)	(0.104)	(0.11)	(0.084)	(0.062)
	CEO Gender	0.1347***	0.0549	0.0431	0.2775***	0.2082***
		(0.05)	(0.063)	(0.074)	(0.062)	(0.045)
	Experience	0.0328***	0.0365***	0.0362***	0.0458***	0.0342***
		(0.006)	(0.008)	(0.008)	(0.009)	(0.006)
	Education	-0.0544***	-0.0583***	-0.0575***	-0.0969***	-0.0665***
		(0.017)	(0.019)	(0.019)	(0.021)	(0.018)
Board related	Board Size	0.0080***	0.0070*	0.0078*	0.0112***	0.0079***
		(0.003)	(0.004)	(0.004)	(0.004)	(0.003)
	Board Independence	0.0897	0.0673	0.041	0.0808	0.1102*
		(0.063)	(0.073)	(0.08)	(0.075)	(0.059)
Bank related	Leverage	0.0035***	0.0033***	0.0033***	0.0026**	0.0022***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.009	0.0119	0.0135*	0.0104	0.0036
		(0.007)	(0.007)	(0.007)	(0.008)	(0.006)
	Liquidity	0.0022***	0.0023***	0.0025***	0.0029***	0.0019***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.0389**	0.0485**	0.0412*	0.0325	0.0285*
		(0.02)	(0.022)	(0.022)	(0.023)	(0.017)
	Capital-Asset Ratio	-0.0125***	-0.0155***	-0.0152***	-0.0183***	-0.0118***
		(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
	Cost-to-Income	0.0004	0.0004	0.0003	-0.0002	0.0002
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Size	0.0872***	0.0812***	0.0908***	0.0656***	0.0509***
		(0.006)	(0.008)	(0.008)	(0.008)	(0.008)
Fraud detection	Excessive Asset Growth	0.0014***	0.0018***	0.0017***	0.0018***	0.0012***
		(0)	(0.001)	(0.001)	(0.001)	(0.000)
	Abnormal ROA	0.0028	0.0011	0.003	0.0031	0.0018
		(0.004)	(0.005)	(0.005)	(0.005)	(0.004)
	Adverse Stock Dummy	0.0843***	0.1076***	0.1019***	0.1097***	0.0755***
		(0.03)	(0.033)	(0.033)	(0.03)	(0.023)
	Abnormal Stock Turnover	-0.0096	-0.0098	-0.0104	-0.0084	-0.0055
		(0.009)	(0.01)	(0.01)	(0.01)	(0.007)
	Abnormal Stock Volatility	0.0253***	0.0179*	0.0241**	0.0216**	0.0193**
		(0.008)	(0.01)	(0.011)	(0.01)	(0.008)
	News ratio	0.0002	0.0003	0.0003	0.0003	0.0003
		(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
	Financial Crisis	Yes	Yes	Yes	Yes	Yes
	Regulatory Effectiveness	Yes	Yes	Yes	Yes	Yes
	Dodd-Frank Dummy	Yes	Yes	Yes	Yes	Yes
	Observations	4400	4400	4400	4400	4400
	Log-likelihood	-2006.28	-2024.00	-2035.12	-2005.18	-1953.27
	Wald chi2	598.17	605.30	572.29	623.89	650.93

Table 60: Probit estimates of the likelihood of a bank fraud in technical sample.

This table reports probit model estimation results in technical sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.1314***				0.1308***
		(0.009)				(0.009)
	CEO Ownership		0.0456			0.0482
			(0.036)			(0.037)
	CEO Duality			-0.0422**		-0.0203
				(0.017)		(0.018)
	CEO Network Size				0.0053	0.0075
					(0.006)	(0.006)
CEO related	CEO Age	0.2980***	0.4033***	0.4279***	0.4146***	0.3275***
		(0.064)	(0.062)	(0.063)	(0.064)	(0.067)
	CEO Gender	0.016	0.0246	0.0248	0.0216	0.016
		(0.040)	(0.041)	(0.040)	(0.042)	(0.043)
	Experience	0.0178**	0.0181**	0.0196***	0.0181**	0.0175**
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	Education	0.0367**	0.0292*	0.0299*	0.0267	0.0313*
		(0.016)	(0.016)	(0.016)	(0.017)	(0.017)
Board related	Board Size	-0.0065**	-0.0093***	-0.0093***	-0.0095***	-0.0070**
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	Board Independence	0.094	0.1547**	0.1224*	0.1523**	0.0814
		(0.071)	(0.07)	(0.071)	(0.07)	(0.072)
Bank specific	Leverage	0.0045***	0.0041***	0.0040***	0.0040***	0.0045***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.003	0.0096	0.0101	0.0097	0.0021
		(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	Liquidity	-0.0016**	-0.0017**	-0.0017**	-0.0017**	-0.0017**
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.1338***	0.1305***	0.1311***	0.1296***	0.1336***
		(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
	Capital-Asset Ratio	-0.0200***	-0.0221***	-0.0220***	-0.0220***	-0.0202**
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Cost-to-Income	0.0018***	0.0015***	0.0015***	0.0015***	0.0017***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Size	0.0926***	0.0828***	0.0919***	0.0851***	0.0885***
		(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
	Financial Crisis	Yes	Yes	Yes	Yes	Yes
	Regulatory Effectiveness	Yes	Yes	Yes	Yes	Yes
	Dodd-Frank Dummy	Yes	Yes	Yes	Yes	Yes
	Observations	4085	4085	4085	4085	4085
	Log-likelihood	-2312.55	-2427.68	-2425.55	-2428.11	-2310.36
	Pruedo R2	0.1384	0.0955	0.0963	0.0953	0.1392

Table 61: Bivariate probit estimates of the likelihood of detecting bank fraud in technical sample.

This table reports bivariate probit model estimation results in technical sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of detecting fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud by employing fraud detecting variables. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.1332***				0.1321***
		(0.011)				(0.013)
	CEO Ownership		-0.0014			0.0032
			(0.045)			(0.051)
	CEO Duality			0.0123		0.0023
				(0.022)		(0.018)
	CEO Network Size				0.0280***	0.0256***
					(0.008)	(0.007)
CEO related	CEO Age	0.4537***	-0.1201	-0.1435	-0.0006	-0.097
		(0.086)	(0.074)	(0.089)	(0.085)	(0.082)
	CEO Gender	0.088	0.1564**	0.8674***	0.2577***	0.1894***
		(0.065)	(0.068)	(0.123)	(0.053)	(0.051)
	Experience	0.0012	0.0442***	0.0553***	0.0757***	0.0538***
		(0.009)	(0.009)	(0.010)	(0.011)	(0.009)
	Education	0.0449*	-0.0254	-0.0489**	-0.0988***	-0.0668***
		(0.023)	(0.018)	(0.021)	(0.024)	(0.022)
Board related	Board Size	-0.0194***	0.0199***	0.0170***	0.0101**	0.0181***
		(0.006)	(0.004)	(0.004)	(0.004)	(0.004)
	Board Independence	0.1966*	0.1867**	0.2755***	0.3225***	0.1857**
		(0.104)	(0.082)	(0.089)	(0.085)	(0.081)
Bank related	Leverage	0.0055***	0.0069***	0.0091***	0.0080***	0.0069***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.0024	0.0156	0.0180*	0.0163*	0.007
		(0.01)	(0.01)	(0.01)	(0.008)	(0.01)
	Liquidity	-0.0027***	0.0018**	0.0011	-0.0005	-0.0003
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.2357***	0.0900***	0.1001***	0.1036***	0.0849***
		(0.045)	(0.03)	(0.025)	(0.025)	(0.029)
	Capital-Asset Ratio	-0.0183***	-0.0150***	-0.0135***	-0.0164***	-0.0147***
		(0.003)	(0.005)	(0.003)	(0.003)	(0.004)
	Cost-to-Income	0.0007	0.0016***	0.0017***	0.0008	0.0014***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Size	0.1298***	0.0640***	0.1054***	0.0981***	0.0641***
		(0.012)	(0.010)	(0.012)	(0.010)	(0.009)
Fraud detection	Excessive Asset Growth	0.0026***	0.0027***	0.0035***	0.0030***	0.0018***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Abnormal ROA	-0.0155**	-0.0049	-0.0052	-0.0098	-0.0036
		(0.007)	(0.004)	(0.006)	(0.006)	(0.006)
	Adverse Stock Dummy	0.0975**	0.0952***	0.0904***	0.0706*	0.0704***
		(0.038)	(0.034)	(0.033)	(0.036)	(0.02)
	Abnormal Stock Turnover	-0.0542***	0.0046	-0.0734***	-0.0804***	0.0124
		(0.014)	(0.015)	(0.013)	(0.013)	(0.015)
	Abnormal Stock Volatility	0.0291**	0.0532***	0.0740***	0.0669***	0.0464***
		(0.012)	(0.012)	(0.011)	(0.012)	(0.010)
	News ratio	0.0005	0.0003	0.001	0.0014	0.001
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Financial Crisis	Yes	Yes	Yes	Yes	Yes
	Regulatory Effectiveness	Yes	Yes	Yes	Yes	Yes
	Dodd-Frank Dummy	Yes	Yes	Yes	Yes	Yes
	Observations	3671	3597	3671	3671	3597
	Log-likelihood	-2039.91	-2098.17	-2131.45	-2100.64	-1979.92
	Wald chi2	555.95	407.55	454.85	498.19	508.09

Table 62: Probit estimates of the likelihood of a bank fraud in non-technical sample.

This table reports probit model estimation results in non-technical sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.1305***				0.1322***
		(0.009)				(0.009)
	CEO Ownership		0.1305***			0.0911***
			(0.009)			(0.033)
	CEO Duality			0.0094		0.0286
				(0.018)		(0.018)
	CEO Network Size				0.0087	0.0072
					(0.006)	(0.006)
CEO related	CEO Age	0.1767**	0.1767**	0.2985***	0.3244***	0.1788**
		(0.068)	(0.068)	(0.067)	(0.068)	(0.071)
	CEO Gender	-0.0121	-0.0121	0.006	0.0049	-0.0082
		(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
	Experience	0.0329***	0.0329***	0.0304***	0.0308***	0.0315***
		(0.008)	(0.008)	(0.007)	(0.007)	(0.008)
	Education	0.0419**	0.0419**	0.0385**	0.0331*	0.0358**
		(0.017)	(0.017)	(0.017)	(0.017)	(0.018)
Board related	Board Size	-0.0128***	-0.0128***	-0.0128***	-0.0132***	-0.0133***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	Board Independence	-0.1526**	-0.1526**	-0.1137	-0.1192	-0.1437*
		(0.074)	(0.074)	(0.073)	(0.073)	(0.075)
Bank specific	Leverage	0.0056***	0.0056***	0.0045***	0.0045***	0.0055***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.0144*	0.0144*	0.0227***	0.0220***	0.0125
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
	Liquidity	0.0013*	0.0013*	0.0011	0.0011	0.0013*
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.0926***	0.0926***	0.0863***	0.0849***	0.0909***
		(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
	Capital-Asset Ratio	-0.0200***	-0.0200***	-0.0229***	-0.0230***	-0.0205***
		(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
	Cost-to-Income	0.0015***	0.0015***	0.0012**	0.0012**	0.0013***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Size	0.1488***	0.1488***	0.1413***	0.1394***	0.1341***
		(0.007)	(0.007)	(0.008)	(0.008)	(0.009)
	Financial Crisis	Yes	Yes	Yes	Yes	Yes
	Regulatory Effectiveness	Yes	Yes	Yes	Yes	Yes
	Dodd-Frank Dummy	Yes	Yes	Yes	Yes	Yes
	Observations	4302	4302	4302	4302	4302
	Log-likelihood	-2264.95	-2371.99	-2374.61	-2373.79	-2259.21
	Pruedo R2	0.2170	0.1800	0.1791	0.1793	0.2189

Table 63: Bivariate probit estimates of the likelihood of detecting bank fraud in non-technical sample.

This table reports bivariate probit model estimation results in non-technical sample. Columns 1, 2, 3, and 4 report the marginal effects of the estimated relations between individual CEO power variables and the likelihood of detecting fraud, and Column 5 reports the marginal effects of the estimated relations between four CEO power variables and the likelihood of fraud by employing fraud detecting variables. By following Wang (2013), bank specific variables are employed in the estimations with their one period lagged values. In order to control financial crisis, regulatory environment, and legal effect, Financial Crisis Dummy, Regulatory Effectiveness, and Dodd-Frank Dummy variables are employed. The sample period is from 1998 to 2015. Robust standard errors are provided in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		(1)	(2)	(3)	(4)	(5)
CEO power	CEO Tenure	0.1539***				0.1554***
		(0.011)				(0.012)
	CEO Ownership		-0.0271			0.0044
			(0.038)			(0.041)
	CEO Duality			0.0331		0.1495***
				(0.021)		(0.024)
	CEO Network Size				-0.0393	0.0485***
					(0.016)	(0.009)
CEO related	CEO Age	-0.3338**	-0.5491***	-0.6445***	-0.7027***	-0.5098***
		(0.166)	(0.1)	(0.108)	(0.126)	(0.104)
	CEO Gender	-0.1667***	-0.0984*	-0.1492***	-0.2172***	0.078
		(0.056)	(0.052)	(0.05)	(0.052)	(0.05)
	Experience	0.0280***	0.0578***	0.0362***	-0.003	0.0837***
		(0.01)	(0.009)	(0.009)	(0.01)	(0.01)
	Education	0.0232	0.0561***	0.0534***	0.0398*	-0.1307***
		(0.026)	(0.021)	(0.02)	(0.024)	(0.029)
Board related	Board Size	0.0035	0.0212***	0.0264***	0.0144***	0.0181***
		(0.007)	(0.005)	(0.005)	(0.005)	(0.005)
	Board Independence	-0.1849*	0.1462*	0.0783	0.1009	0.0802
		(0.099)	(0.088)	(0.102)	(0.102)	(0.096)
Bank related	Leverage	0.0073***	0.0061***	0.0076***	0.0118***	0.0081***
		(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
	ROA	0.0281***	0.0884***	0.1002***	0.0539***	0.0420***
		(0.01)	(0.014)	(0.015)	(0.012)	(0.013)
	Liquidity	0.0040***	0.0087***	0.0082***	0.0082***	0.0083***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Loan Provisions	0.0804***	0.3087***	0.3158***	0.3135***	0.0117
		(0.028)	(0.067)	(0.045)	(0.047)	(0.027)
	Capital-Asset Ratio	-0.0161***	-0.0181***	-0.0186***	-0.0143***	-0.0224***
		(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
	Cost-to-Income	0.0013**	0.0024***	0.0026***	0.0009	0.0006
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Size	0.1553***	0.1326***	0.1211***	0.1549***	0.1021***
		(0.011)	(0.009)	(0.011)	(0.011)	(0.01)
Fraud detection	Excessive Asset Growth	0.0005	0.0013***	0.0004	0.0011*	0.0011
		(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
	Abnormal ROA	0.001	0.0098**	0.0161***	0.0118	0.0173***
		(0.007)	(0.005)	(0.005)	(0.009)	(0.005)
	Adverse Stock Dummy	0.0479	0.0239**	0.0232***	0.0325**	0.0516
		(0.03)	(0.01)	(0.007)	(0.014)	(0.041)
	Abnormal Stock Turnover	-0.0004	0.0117	0.0233*	0.0437***	0.0153
		(0.014)	(0.012)	(0.013)	(0.011)	(0.017)
	Abnormal Stock Volatility	0.0381***	0.0667***	0.0542***	0.0509***	0.0602***
		(0.012)	(0.011)	(0.009)	(0.011)	(0.013)
	News ratio	0.0001	0.0016	0.0015	0.0007	0.001
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Financial Crisis	Yes	Yes	Yes	Yes	Yes
	Regulatory Effectiveness	Yes	Yes	Yes	Yes	Yes
	Dodd-Frank Dummy	Yes	Yes	Yes	Yes	Yes
	Observations	3840	3783	3803	3374	3762
	Log-likelihood	-2037.75	-2076.32	-2082.87	-1839.18	-1917.39
	Wald chi2	888.32	720.34	741.49	712.80	787.34

Appendix G: Correlation Matrix for Selected Variables

Table 64: Correlation matrix of the variables that used in estimation models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
CEO Tenure (1)	1																						
CEO Ownership (2)	-0.01	1																					
CEO Duality (3)	-0.06	0.22	1																				
CEO Network Size (4)	-0.05	0.20	0.16	1																			
CEO Age (5)	0.15	-0.04	0.17	-0.20	1																		
CEO Gender (6)	0.01	-0.04	-0.05	0.03	-0.04	1																	
Experience (7)	-0.01	0.15	0.16	0.19	-0.04	-0.04	1																
Education (8)	0.00	0.16	0.05	0.32	-0.08	0.03	0.12	1															
Board Size (9)	-0.03	0.29	0.13	0.25	-0.03	-0.06	0.08	0.11	1														
Board Independence (10)	0.02	-0.11	-0.12	0.08	-0.03	0.07	0.10	0.06	0.02	1													
Leverage (11)	0.01	-0.28	-0.12	-0.09	0.00	-0.03	-0.11	-0.06	-0.03	0.07	1												
ROA (12)	0.07	0.11	0.04	0.04	0.03	-0.02	0.01	0.02	0.09	-0.06	-0.10	1											
Liquidity (13)	-0.03	0.10	0.01	0.08	-0.04	-0.01	0.01	0.03	0.05	0.00	-0.02	0.06	1										
Loan Provisions (14)	-0.05	0.00	0.03	0.06	-0.02	-0.02	0.05	-0.01	-0.05	0.01	-0.07	-0.37	0.01	1									
Capital-Asset Ratio (15)	-0.09	-0.05	0.03	-0.02	0.14	-0.02	0.04	-0.08	-0.07	-0.01	-0.32	0.20	0.00	0.14	1								
Cost-to-Income (16)	-0.09	-0.17	-0.07	-0.03	-0.02	0.03	-0.03	-0.03	-0.11	0.07	0.11	-0.66	0.03	0.27	-0.08	1							
Size (17)	0.00	0.57	0.39	0.40	0.07	-0.05	0.32	0.23	0.42	0.01	-0.32	0.12	0.09	0.03	-0.04	-0.25	1						
Excessive asset growth (18)	0.00	0.02	-0.05	0.03	-0.05	-0.01	0.00	0.00	0.10	-0.09	-0.02	0.16	-0.08	-0.15	0.01	-0.18	0.03	1					
Abnormal ROA (19)	0.03	0.06	0.03	0.04	0.02	-0.02	0.01	0.01	0.07	-0.03	-0.05	0.89	0.08	-0.33	0.15	-0.56	0.07	0.08	1				
Adverse Stock Dummy (20)	-0.01	-0.04	-0.04	-0.06	-0.01	0.02	-0.02	-0.03	-0.08	0.03	0.02	-0.37	-0.09	0.25	-0.13	0.30	-0.09	-0.11	-0.31	1			
Abnormal Stock Turnover (21)	-0.04	0.37	0.29	0.29	0.03	-0.02	0.30	0.16	0.17	0.05	-0.26	-0.03	-0.03	0.14	0.11	-0.09	0.64	0.06	-0.03	0.03	1		
Abnormal Stock Volatility (22)	-0.03	0.08	0.05	0.03	-0.02	0.03	0.02	0.01	0.00	0.03	0.01	-0.40	-0.04	0.40	-0.16	0.31	0.04	-0.15	-0.29	0.45	0.20	1	
News Ratio (23)	0.06	0.04	0.16	0.09	0.00	-0.01	0.08	0.01	0.09	0.02	0.02	0.01	0.00	0.06	0.00	-0.07	0.17	-0.04	0.01	0.00	0.19	0.12	1

General Conclusion

1. Summary

This PhD research is comprised of four papers, aimed to examine the effect of information advantage of bank CEOs and senior executives on bank risk and performance, and also investigate to reveal which CEO power variables that denote information advantage to the CEO, influence the likelihood of bank fraud and the likelihood of detecting fraud. Specifically, it has targeted to provide answer to following main research questions;

1. Which regulatory changes have influenced the structure of the US banking industry?

2. Do network size and tenure of the CEO affect bank risk?

3. Do institutional investor-connected executives affect the listed US bank performance and ownership structure?

4. Do powerful CEOs increase the likelihood that US banks will engage in financial fraud?

First, Paper 1 provided a fifteen-year window of the US banking industry to understand the structure, size, and performance of US banks. Second, the paper linked the evolution of the US banks with regulatory changes over a century. Third, the factors that make banking industry special in the economy were assessed by reviewing the literature on corporate governance of banking institutions, risk taking, performance, and regulation connection in this paper. At the final stage, paper reviewed current US bank regulators by providing their legal origins, performance indicators, and organisational structures.

Paper 1 has put forward that legal authority's regulatory changes in the US banking system reshaped the industry and corporate governance structure in US banks over the last century. Following the period of the great depression, the need for separation of commercial and investment banking satisfied by Glass-Steagall Act of 1933. During four decades before the 1980s, interstate banking and branching were forbidden. Technological progress in the 1980s and 1990s that diversify the structure and increase the number of the financial instruments accelerated the deregulation period. Specifically,

the Depository Institutions Deregulation and Monetary Control Act of 1980 and Garn-St. Germain Depository Institutions Act of 1982 allowed banks to gain a competitive advantage against non-bank investment institutions. At the beginning of the 2000s, the deregulation period was completed with the Gramm-Leach-Bliley Act of 1999 that repealed the restrictions on separation of commercial and investment banking. In this period, banks increased their non-financial incomes by involving into the non-traditional banking businesses. The critical era of the end of this deregulation period is the recent global financial crisis between 2008 and 2010. Then, the Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010 to set the walls to regulate the financial markets again. The aforementioned regulatory changes differentiated the corporate governance of banks in the US. In addition to these changes, financial intermediation role, risk behaviour, and opaqueness on transactions of banks made them special in corporate governance applications. Especially, the efforts that aim to increase the functionality of board of directors and restrictions of investment banks changed the ownership structure of banks and increased the importance of good corporate governance practice. Additionally, paper 1 with appendices, which consist of the investigation of main balance sheet items of banks and geographical dispersions of US bank regulators, displayed structure and performance of US banks and US bank regulators. The general review of the US banking system in Paper 1 provided a study field where the empirical papers of this PhD research placed in order investigate the information advantage of CEOs and senior executives on US bank risk and performance and the role of CEO power on the likelihood of bank fraud.

Paper 2 focused on the CEO power that is the source of information advantage of agent and its effect on bank risk. The purposes of paper 2 were to employ appropriate measures of CEO power and to investigate the effect of these measures on bank risk. Following the theories that aim to investigate the adverse selection and moral hazard problems, CEO power was represented by two determinants: CEO tenure and CEO network size. Paper 2 employed three bank risk measures: the first was the Z-score of each bank, which is a measure of distance from solvency; the second, which describes the average stock market reaction of each bank to movements on the overall stock market index, was a measure of systematic risk; the third, which captures the reaction of individual banks to systemic

events, was a measure of systemic risk. The effects of CEO power determinants on different bank risk measures are analysed. CEO characteristics (such as age, gender, experience, and education), corporate governance mechanism indicators (such as board size and board independence), bank financial characteristics (such as liquidity, leverage, loan loss provisions, capital-asset ratio, cost-to-income ratio, return on assets, and size), and ownership structure indicators (such as institutional ownership, individual ownership, and ownership concentration) were employed as control determinants of bank risk.

Paper 2 tried to mitigate endogeneity concerns on analyses. Additionally, different perspectives that might affect the results and different time periods were investigated to validate the findings. The main findings of paper 2 revealed that publicly listed US banks are more likely to take more risk when CEO has longer tenure and larger network size, which it is interpreted as CEO has more power and information advantage. For three risk measures, less leveraged larger banks, which have loan loss problems, with younger CEOs take more risk. Results also demonstrate that smaller and less independent boards and more institutional investment increase bank risk.

Paper 3 broadened the perspective of information advantage by taking the appointments of board members into consideration in addition to the appointments of professional managers, called them "executives", and investigated their previous professional connections. Specifically, paper 3 examined the networks of executives and their effect on performance and ownership structure of banks. First, the change in institutional ownership structure after the appointment of executives was analysed. The appointment of them is considered as the main determinant of bank performance. Accordingly, the appointment effect of executives on bank performance was analysed by employing three performance measures: the first measure, which denotes bank profitability, was non-interest income to total assets ratio; the second measure, which captures the market integration capacity of a bank, was market beta; and the third measure, which describes bank value, was Tobin's Q. Executive characteristics (such as age, tenure, and gender, bank financial characteristics (such as CAMELS rating indicators that cover the capital adequacy, asset quality, management capability, earnings, liquidity, and sensitivity), ownership structure indicators (such as institutional ownership, individual ownership, public ownership, and ownership concentration), and market condition determinants

(such as GDP change, interest rate change, and market concentration) are used in order to isolate the effect of appointment of the executive on bank performance.

In order to validate the results of the aforementioned analyses, Paper 3 employed a set of analyses by using matching techniques and defining additional indicators that reveal the interactions between bank specifications and ownership structure. The findings of Paper 3 on ownership structure revealed that the appointment of executive increases the institutional investment and changes the ownership concentration if the executive has previous connections with institutional investors of the bank. The findings on bank performance indicated that banks perform better regarding profitability, comply with the market regarding integration, and become undervalued regarding value.

Paper 4 narrowed the perspective of information advantage by focusing on CEO power again and shifted the attention from risk and performance to financial fraud in US banks. Specifically, paper 4 investigated the effect of CEO power on the likelihood of financial fraud in banks in which financial fraud of banks is an extreme case of using information advantage by agents. First, CEO power indicators were determined as information advantage determinants; CEO tenure, CEO ownership, CEO duality, and CEO network size. In order to detect the likelihood of fraud, CEO characteristics, board structure, and bank financial indicators and market condition determinants were controlled in analyses.

Paper 4 also investigated the different formations of the sample to validate the results from the analyses. The findings of paper 4 revealed that likelihood of finding that a bank had engaged in financial crime is greatest where CEO is more powerful as CEO is highly tenured and the equity-based compensation of the CEO is greater than direct compensation. Also, experienced and older CEOs, who work with smaller boards in highly leveraged, less well-capitalized banks are more likely to involve into the fraudulent activities. Correspondingly, the results indicated that principal-agent problem become distinct when the CEO has more power that allows the use of information advantage, even in the case of fraud.[49]

[49] Appendix A, Table 65 summarizes the empirical results of Papers 2, 3, and 4.

2. General Discussion

Unquestionably, banks are the main and unique elements of the economy. The banking system plays an essential role in its function of transferring funds from households to investment units. Also, the financial intermediation role of banks increases the volume of funds in the economy (Levine et al., 2000). Banks also change the maturity of funding by producing new types of contracts. In the US, banks that collect most of their funds from customer deposits is the largest financial institution group - banks hold more than 20 percent of the US financial intermediaries' assets – and continue to be important intermediaries of the economy (DeYoung, 2012).

The current US banking industry has evolved during the last century (Neal and White, 2012). Regulation and deregulation processes in US financial markets create a dynamic environment (Stiroh and Strahan, 2003). As the industry grows and competition increases more banks aspire to perform better to survive. As the importance of banks expands in the economy, the bank corporate governance that is different from the non-financial firms become more imperative for all participants of the industry as well as for academics. The complexity of the structure of banking institutions and opaqueness of the banking industry make the corporate governance mechanisms essential (Mehran et al., 2011). An increasing number of studies investigate the bank corporate governance structure and how it differs from that of non-financial firms (Acharya et al., 2009; Caprio and Levine, 2002; Devriese et al., 2004; Laeven, 2013; Levine, 2004; Macey and O'Hara, 2003; Mullineux, 2006). Also, US bank regulators' too commence to pay more attention towards performance and risk involved in the industry as well as their impacts on bank corporate governance.

The core theme of this work is to understand the effect of information advantage of bank CEOs and senior executives on bank risk and performance as well as the likelihood of fraud and to reveal which factors represent the information advantage. Despite its importance, the bank corporate governance literature is limited; primarily because of data unavailability. This study argues CEO power as a source of information advantage and demonstrates that information advantage of bank CEOs and senior executives on bank risk and performance. This study also shows that the information advantage is an essential

factor on the likelihood of bank fraud. The empirical studies of the thesis reveal that information advantage, which is the main component of information asymmetry, affects the corporate governance of banks in many aspects. Excessive risk-taking by banks is widely blamed as a primary factor behind the financial meltdown of 2007-2008. Between 2000 and 2006, a preliminary examination of stock price volatility does not seem to support the idea that the financial markets deemed the level of risks assumed by banks to be excessive. The performance of a bank, that is essential in the financial system, is also essential for the entire financial system and the whole economy. The close relations of bank risk-taking and performance with the corporate governance of a bank make the corporate governance structure of bank important for not only the industry, but also the whole financial system. This work attempts to answer the research questions that relates information advantage of executives and bank risk-taking and performance. The empirical evidences of the study show that information advantage of executives significantly affect bank risk-taking and bank performance. Beyond the discussed effect of information advantage above, the thesis also attempts to explore the effect of information advantage of executives on corporate fraud. The empirical evidences show that powerful CEOs, who have information advantage, increases the likelihood of fraud and likelihood of detecting fraud.

The thesis makes several contributions to the existing literature in understanding the effect of CEO power on bank risk and the likelihood of fraud and information advantage of senior executives on bank performance. In the thesis, CEO power is used the determinant of information advantage of the agent.

First, unlike any other earlier study (to author's knowledge), the thesis approached CEO power as a source of information advantage from a corporate governance perspective. In corporate governance literature very few of the studies considered CEO power as a source of information advantage of the CEO but rather regarded it as a CEO demographic indicator. The analysis provided in this work incorporates the motivations discussed by the literature on bank risk taking when powerful CEO, who has information advantage compared to other components of the business, is in charge. These motivations include information advantage of agents (Adams et al., 2008; Harris and Raviv, 2008; Miller and Rock, 1985; Myers and Majluf, 1984; Raheja, 2005), CEO characteristics on risk taking

(Acrey et al., 2011; Adhikari and Agrawal, 2016; Berger et al., 2014; Buyl et al., 2017; Cain and McKeon, 2016; Coles et al., 2006; Faccio and Lang, 2002; Gray and Cannella, 1997; Hagendorff and Vallascas, 2011; Neacsu et al., 2014; Pathan, 2009; Serfling, 2014), board structure (Ferrero-Ferrero et al., 2012; Minton et al., 2014), and ownership structure (Laeven and Levine, 2009; Saunders et al., 1990; Wright et al., 1996). Empirical evidence that is gathered from fixed effects and GMM estimators presented in this paper revealed that information advantages related to larger network sizes and longer tenures of CEOs lead banks to take more risk that measured by Z-score, systematic risk, and systemic risk, respectively. On the other hand, less leveraged larger banks, which have loan loss problems are found to be more likely to take on more risks when younger CEO's have a relatively long tenure and large network.

Secondly, several studies (Betzer and Theissen, 2009; Fidrmuc et al., 2006; Friederich et al., 2002; Jeng et al., 1999; Ravina and Sapienza, 2010) tried to uncover insider gains without using the network perspective. The literature on the network (Burt, 1992; Cohen et al., 2008; Courtney and Jubb, 2001; El-Khatib et al., 2015; Fracassi, 2016; Haunschild, 1993; Hong et al., 2005; Kuhnen, 2009; Shue, 2013; Uzzi, 1996) investigated the effect of networks (social and/or professional) on corporate governance structure and firm performance. This study is the first one (to author's knowledge) to incorporate the network and insider gain by investigating the effect of invisible networks on bank performance and ownership structure. By grouping board members and professional managers as executives and inspecting their networks, it is revealed that the appointment of institutional investor-connected executive increases the institutional investment and changes the ownership concentration if the executive has previous connections with institutional investors of the bank. Results of the pooled cross-sectional regressions at different forwarded time periods that examine the appointment of the executive, who has a previous professional connection with the institutional investor, also indicated that banks perform better regarding profitability (in terms of non-interest income to total assets), comply with the market regarding integration (in terms of market beta), and become undervalued regarding value (in terms of Tobin's Q).

Finally, turning to bank fraud, although earlier studies in definition of fraud (Armstrong et al., 2010; Burns and Kedia, 2006; Efendi et al., 2007; Goldman and Slezak, 2006;

Johnson et al., 2009; Peng and Röell, 2008) and empirical financial fraud studies in corporate governance and accountancy investigated the nature of financial fraud and whether there is connection between fraud and corporate governance and accountancy, the thesis is the first in corporate governance literature (to author's knowledge) to explore rationale behind likelihood of fraud of banks when the powerful CEOs are in charge.[50] Particularly, the thesis investigated the CEO power on the likelihood of fraud and the likelihood of detecting fraud by employing limited dependant variable models (probit model and bivariate probit model). The findings revealed that the likelihood of bank fraud increases if CEO is more powerful that reflects the information advantage. Especially, the likelihood of fraud is greatest where CEO is highly tenured and the equity-based compensation of the CEO is greater than direct compensation. Consequently, experienced and older CEOs, who work with smaller boards in highly leveraged, less well-capitalized banks are more likely to involve into the fraudulent activities.

3. Limitations, Policy Implications, and Suggestions for Further Research

3.1 Limitations of the study

Limitations of the study are mainly related to data coverage and availability. Although research conducted in this study contributes to the literature in many ways, the analysis could have been extended more if constraints about the data were not confronted. The limitations can be outlined as follows.

One of the data limitation of this study is data unavailability of unlisted US banks. Focusing on publicly-listed US banks limits the number of banks to 908 in paper 2, 820 in paper 3, and 960 in paper 4. For the period of 2010 and 2015, the number of US banks is more than 5,500. Thus unlisted banks are the majority of US banking industry although they are small in size and run their businesses in relatively small regions. Under these

[50] See also (Agrawal and Chadha, 2005; Alexander and Cohen, 1996; Beasley, 1996; Beatty et al., 1998; Bhagat et al., 1998; Dechow et al., 1996; Elayan et al., 2008; Erickson et al., 2006; Farber, 2005; Harris and Bromiley, 2007; Hennes et al., 2008; Jayaraman and Milbourn, 2014; Johnson et al., 2009; Karpoff Lee et al., 2008; Karpoff Scott Lee et al., 2008; Karpoff and Lott, 1993; Khanna et al., 2015; Murphy et al., 2009; Nguyen et al., 2016; Palmrose and Scholz, 2004; Uzun et al., 2004; Xu et al., 2006) for the recent studies in the literature.

conditions, a larger data that include unlisted banks might be more appealing. If the data were obtainable, capturing the extent of bank risk and performance, it would be more appropriate to include unlisted banks, which have different business models.

At the dataset, the unavailability of US bank specific information before 1998 is a downside for the first and second papers' analysis linking information advantage of CEOs and bank risk and of senior executives and bank performance. In addition to the unavailability of bank-specific information, the detailed demographic and network information of board members and professional managers before 2000 is limited. If the data were obtainable, rather than using the sample periods of 1998 and 2015 for the first paper and 2000 and 2013 for the second paper, a sample period that covers before 1998 would provide better understanding of the effect of information advantage of CEOs and senior executives on bank risk and performance as well as of the change of the effect in time. The extended data period would also allow the study to link the regulation and deregulation periods and the aforementioned relations by controlling economic externalities.

The data limitation for the first and second papers is also common for the third paper. In addition to the unavailability of US bank specific information before 1998, accessing to US bank regulatory enforcement actions is extremely challenging. If the data of enforcement actions before 1998 were obtainable, more fraud cases would be investigated to understand the effect of CEO power on the likelihood of bank fraud. Additionally, the coverage of enforcement action documents does not provide a clear picture on the factors and timing of committing bank fraud. A committing fraud determinant that is obtained by using detailed enforcement action information would allow bivariate probit estimations to provide interpretable results of committing bank fraud.

3.2 Policy implications

New restrictive regulations on bank safety and soundness have potential to eliminate the volatility and bring more stability in the financial markets. Also, these restrictions help to implement monetary policies of the legal authorities and protect customers from any bank specific or entire collapses in the banking industry. On the other hand, more constraints

on banking industry might decline the operating profits of banks below the benchmark. Hence, the right regulation is a target to investigate and decide fairly for each component of the industry.

The thesis illustrates empirical evidence for future policy implications. In this manner, the findings contribute to some aspects regarding bank regulations. In general, the thesis points out the information advantage of bank CEOs and senior executives against other components of the business from many aspects. This finding per se emphasises the importance of bank corporate governance on risk management, performance evaluation, and enforcements.

Results of each paper in the thesis provide evidence for the effective board of directors regarding size and independence. In addition to the regulations and recommendations of board independence, independence on committees that nominate the CEO and decide on the compensation plans of professional managers should be regulated in order to increase the efficiency of corporate governance mechanisms. The optimum size of the board of directors should also be strongly recommended.

The empirical findings derived from the bank related determinants pointed out that bank risk and the likelihood of fraud increase at less well-capitalized banks. The results also revealed that bank size that is measured by bank total assets increases bank risk and the likelihood of fraud. Consistent with "too big to fail" concept, the larger banks create negative externalities in the industry. Under these conditions, the regulators should re-evaluate the capital requirements of banks and inspect the banks, which are suitable for "too big to fail" concept, more than four times in a fiscal year.

Paper 2 reveals that publicly listed US banks are more likely to take more risk when CEO has longer tenure and larger network size. It is clear that limiting the tenure of the CEO and applying restriction on individuals' network sizes expansion are not possible. Under these conditions, market regulators should establish mechanisms to monitor the individuals to detect any negative externality on bank stability.

The findings of Paper 3 point out that the appointment of board members and professional managers increases the institutional investment, changes the ownership concentration, and affects bank performance if they have previous connections with institutional investors of the bank. For this case, US bank regulators should force senior executives to release their detailed biographies that provide previous professional activities. Also, regulators should also effectively inform the society on information transparency and the shareholder rights they have.

Finally, paper 4 reveals that likelihood of finding that a bank had engaged in financial crime is greatest where CEO is more powerful as CEO is highly tenured and the equity-based compensation of the CEO is greater than direct compensation. Compared to papers 2 and 3, paper 4 focuses on a specific subject. However, the fraudulent activities with their antecedents and consequences are essential in the stability of the entire system. As discussed in paper 1, US bank regulators have recorded an increase in their efficiency regarding increased number of closed consumer complaints in given fiscal years. On the other hand, the increasing trend in the number of inspected bank fraud cases tells that regulators should employ better inspection methods and increase the number of investigations on banks as well as individual, who have responsibility for corporate decisions of banks.

3.3 Suggestions for further research

The empirical study of the thesis provides suggestions for academics in banking and corporate governance fields. The findings offer evidence into the effect of CEO power in bank risk and fraud investigations by examining information asymmetry in the US banks. Additionally, the findings also provide evidence on bank performance and ownership structure by examining the networks of board members and professional managers.

As an avenue for future research CEO power determinants employed in this thesis could be linked to M&A in the banking industry. Information advantage of traders in M&A activities are essential. However, there is no existing work (as far as the author knows) addressing the question how information asymmetry affects the M&A deals with CEO power determinants of this thesis. Such research could be developed by linking

appropriate event studies. From a different perspective, the power of other professional managers such as chief financial officer, chief operating officers, and chief risk officer might also be employed to measure a similar connection with bank risk.

Despite the fact that corporate governance implications vary in different countries. The information advantage of agents that come from CEO power might have a similar mechanism. Correspondingly, the result of the fourth paper could be further enriched by integrating fraud cases of other developed countries as well as other emerging economies to the analysis. This will also provide an opportunity to compare CEO power in US banks with other developed markets and further emerging markets.

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Appendix A: Summary of Empirical Results

Table 65: Empirical results of papers

Table 1: Summary of papers 2, 3, and 4 with empirical results						
	Source of information asymmetry	Dependent variables	Data source	Main explanatory variables	Methodology and Models	Empirical Results
Paper 2	CEO power	Z-score Systematic risk Systemic risk	SNL Financial, FED call reports, Thomson One Analytics' Worldscope, Bloomberg, BoardEx	CEO Tenure CEO Network Size	Multivariate analyses (Fixed effects estimation, GMM estimator)	CEO power exacerbates bank risk-taking.
Paper 3	Previous appointments of executives	NIITTA Market Beta Tobin's Q	Bankscope, Thomson One Analytics' Worldscope, SNL Financial, Bloomberg	Appointment of connected executives	Univariate analysis, and multivariate analyses (pooled cross-sectional regression)	Institutional investor connected executives significantly affect bank performance and ownership structure.
Paper 4	CEO power	Fraud as limited dependent variable Fraud detection as limited dependent variable	Enforcement action and class action litigation databases, BoardEx, Bloomberg, FED call reports, SNL Financial	CEO Tenure CEO Ownership CEO Duality CEO Network Size	Univariate analysis, and multivariate analyses (probit and partially-observed bivariate probit estimations)	Powerful bank CEOs increases the likelihood of fraud and detecting fraud.

The definitions of dependent and independent variables are provided in Papers 2, 3, and 4.
Source: Author's own