TWO ESSAYS ON INFORMATION ASYMMETRY AND CORPORATE GOVERNANCE

by

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ABSTRACT

The underlying theme connecting both my essays is the issue pertaining to information asymmetry and corporate governance.

In my first essay, I analyze whether the information environment has an influence in shaping corporate governance mechanisms for large complex banking organizations. In this context, I focus on corporate board size and corporate board independence which have been identified in the literature as important corporate governance mechanisms. In addition, the role of CEO option based compensation in an informationally opaque environment is explored. The study identifies market based, quasi market based and accounting based proxies for information asymmetry in the banking industry. These proxies are used to analyze their role in shaping corporate governance mechanisms in the banking industry. The results of the study document an inverted U-shaped relationship between proxies of information asymmetry and bank board size across the banks during the sample period. An inverted U-shaped relationship is also documented between proxies of information asymmetry and bank board independence within banks for the same sample period. At the same time, there is little evidence to support the notion that opaque information environment creates a need for greater CEO option based compensation. Finally, the study documents a positive relationship between outside director ownership and board size and a positive relationship between outside director ownership and board independence. This relationship is consistent with the view that when incentive alignment between insiders and shareholders (measured in terms of ownership) is relatively weak, the need for external monitoring by means of additional board members who are independent directors increases.

In my second essay, I seek to identify corporate governance mechanisms that can potentially address the issue of informational asymmetries affecting firms early in their life cycle. Specifically, the study focuses on Real Estate Investment Trusts (REITs) at the IPO stage to empirically examine the role of corporate governance mechanisms in minimizing informational asymmetries. The study documents REIT corporate board structure in terms of board size, board independence and board financial expertise at the IPO stage. The study uses REIT IPO underpricing as a gauge of information asymmetry for REITs. This is an important contribution since very little is known about REIT governance structures at the IPO stage vis a vis the information environment. The results of the study indicate that smaller boards experience lesser degree of underpricing at the IPO stage. Study documents a positive relationship between board size and board independence, suggesting that larger boards on average have proportionately more independent directors. There is no evidence to suggest that board independence and financial expertise reduce the degree of REIT underpricing. This may be due to the unique nature of the real estate industry. REITs frequently access capital markets because they are required to payout 90 percent of their taxable income as dividends. Accessing the capital markets frequently, subjects REITs to enhanced market scrutiny compared to other industries. In this context, additional internal scrutiny by independent directors and financial experts may not play a crucial role for REITs. The study provides some evidence to show a decline in REIT underpricing after the enactment of REIT Modernization Act of 1999. However, the evidence with respect to REIT Modernization Act of 1999 is not conclusive.

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CHAPTER 1

INTRODUCTION

Informational asymmetries play a significant role in creating frictions in the financial markets. At the firm level, informational asymmetries created due to separation between lenders of finance to corporations and those who manage them creates frictions in the financial markets. Inside information that offers insights regarding the true character of the borrower is particularly valuable to the lender. However, a problem arises when the borrower is unable to credibly communicate this information to the lender. This creates an information asymmetry problem, widely recognized and discussed in the field of finance (Akerlof, 1970; Leland and Pyle, 1977).

Frictions created due to informational asymmetries are acute for firms early in their life cycle (Diamond, 1989) when they are more dependent on external financing (Rajan and Zingales, 1998). Similarly, prior studies have suggested that banks are characterized by severe informational asymmetries (for example, see, Furfine, 2001; Morgan, 2002; Levine, 2004). To a great degree, the separation between suppliers of finance and those who manage the finances creates the need for corporate governance mechanisms (Shlifer and Vishny, 1997; Gillan, 2006). In this context, it is likely that the information environment will have an influence in shaping governance mechanisms (Raheja, 2005 and Adams and Ferreira, 2007).

As part of my first essay, I analyze whether the information environment has an influence in shaping corporate governance mechanisms for large complex banking organizations. Theory suggests that the governance mechanisms are influenced by the information environment (for example, see, Raheja, 2005 and Adams and Ferreira, 2007).

At the same time, influence on governance mechanisms appears to be industry specific (for example, see Adams and Mehran, 2003) and relying on 'one size fits all' governance models might be misleading (Coles, Daniel and Naveen, 2007). In this context, it is important to understand the role of information environment in shaping governance mechanisms for large complex banking firms. Specifically, the study focuses on managerial option awards and board composition which are identified in the literature as important corporate governance mechanisms. Boards of directors are the ultimate internal monitors and play a crucial role in mitigating the agency problems (Fama, 1980). More recently, corporate boards have been the focus of shareholder advocacy groups such as Institutional Shareholder Services. In addition, Basel Committee on Banking Supervision (BCBS) has also emphasized the role of board of directors in improving monitoring efficiency in the banking industry which in turn might reduce problems due to informational asymmetries in the banking industry. In this context, the study seeks to analyze governance mechanisms in terms of board composition in the banking industry.

As part of my second essay, I analyze corporate governance mechanisms adopted by firms early in their life cycle that can potentially help mitigate problems created due to informational asymmetries. Previous studies (for example, see, Diamond, 1989) systematically document that information asymmetries are acute for firms early in their life cycle. As noted above, separation between lenders of finance and those who manage finances is at the core of market frictions created by information asymmetries. This separation necessitates a role for corporate governance mechanisms that assure suppliers of finance a return on their investment (Shlifer and Vishny, 1997; Gillan, 2006). Specifically, to analyze the role of corporate governance in minimizing the problems due

to informational asymmetries at IPO stage, the study is confined to the analysis of one industry, real estate. Because of REIT (Real Estate Investment Trusts) specific restrictions, corporate governance mechanisms are likely to be less important for REITs than for most other industries (Hartzell, Kallberg and Liu, 2008). Borrowing arguments from Hartzell, Kallberg and Liu (2008), I posit that finding evidence consistent with the role of corporate governance mechanisms in mitigating problems due to informational asymmetries for REITs would suggest that the role of corporate governance mechanisms should be at least as strong for other corporations in addressing problems due to informational asymmetries.

CHAPTER 2
INFORMATION ASYMMETRY AND CORPORATE GOVERNANCE: A STUDY OF LARGE BANKING INSTITUTIONS

2.1. Introduction

Corporate governance can be defined as "the system of laws, rules and factors that control operations at a company" (Gillan and Starks, 1998). From the investors' perspective, corporate governance mechanisms offer a framework by which the "suppliers of finance to corporations assure themselves of getting a return on their investment" (Shlifer and Vishny, 1997). Given the importance of corporate governance, it is not surprising that the topic of corporate governance has received increased attention in the wake of recent corporate scandals. Despite this increased attention, very few studies have focused on the governance of banks (some exceptions are John and Qian, 2003; Macey and O'Hara, 2003; Adams and Mehran, 2003). This is particularly surprising given that banks are not only an important source of liquidity (and finance) in the economy, but they also play an important role in the governance of other firms (Mehran, 2003; Macey and O'Hara, 2003).

Banks have access to borrower specific confidential private information. As a result, bank insiders are better informed about their borrowers than bank outsiders (Diamond, 1984). In other words, this information asymmetry creates an environment where bank insiders are better informed than outsiders. In this context, the Basel Committee on Banking Supervision (BCBS) stresses the need for effective corporate governance mechanisms for achieving and maintaining public trust and confidence in the

banking system by improving monitoring efficiency.[1] The committee argues that effective corporate governance mechanisms are essential to the proper functioning of the banking sector and economy as a whole. Specifically, the committee advocates that corporate governance mechanisms should provide proper incentives for the board and the management to pursue objectives that are in the interest of the bank and its shareholders. In this regard, the committee emphasizes the role of board of directors and senior management as the key to improving monitoring efficiency. Furthermore, associated theoretical models in the corporate governance literature posit that governance mechanisms are determined in part due to the information environment (for example, see, Raheja, 2005; Adams and Ferreira, 2007; Linck, Netter and Yang, 2008). Given this background, this study intends to analyze how governance mechanisms are shaped as a result of the information environment in the banking industry. This is an important question when we consider that governance mechanisms are industry specific (For example, see, Adams and Mehran, 2003) and relying on "one-size fits all" governance models might be misleading (Coles, Daniel and Naveen, 2007). In view of this gap in our understanding, the study seeks to analyze how corporate governance mechanisms are determined due to the information environment in the banking industry.

The rest of the paper is organized as follows: Section 2.2 provides a review of the literature. Section 2.3 describes hypotheses and provides empirical predictions. Section 2.4 describes the information asymmetry measures used in the study. Section 2.5 describes the methodology used to test the hypotheses. Section 2.6 describes the data and

[1] Enhancing Corporate Governance for Banking Organizations, February 2006

sample construction. Section 2.7 presents the results. And finally, section 2.8 discusses the contributions and limitations of the study.

2.2. Literature Review

As financial intermediaries, banks have access to borrower specific private information and are in a position to screen and monitor their borrowers. Banks typically treat borrower specific private information as confidential and do not publicly disseminate this information. Diamond (1984) elaborates on the notion that financial intermediaries such as banks are delegated the task of costly monitoring of loan contracts and are better equipped to monitor such loan contracts since they benefit from gross cost advantage. As a result bank insiders have more knowledge about their borrowers than outside bank investors. This information gap faced by bank investors creates severe informational asymmetries between bank insiders and outside investors.

In the banking literature, more often than not, the terms informational asymmetries and opacity are used interchangeably. In general, the term "opaque" is used to highlight underlying informational asymmetries existing in the banking industry. For example, Flannery, Kwan and Nimalendran (2004) use "opaque" to characterize underlying informational asymmetries within the banking industry. Specifically they define "opaque" to mean that bank investors cannot value bank assets accurately but bank insiders or specialists might be able to value bank assets accurately. Inherent to the discussion is the understanding that "opacity" is used to signify informational asymmetries existing in the banking industry. In other words, informational asymmetries existing in the banking industry will be the focus of this study.

Consistent with the notion that banks are characterized by severe informational asymmetries, Morgan (2002) argues that banks are fundamentally more "opaque" than other firms and investigates the relative opacity of banks (and insurance companies) with respect to other firms. Opacity is based on the notion that "banks are black boxes, money goes in, and money goes out, but the risks taken in the process of intermediation are hard to observe from outside the bank." In other words, bank insiders might have better knowledge of the risks taken in the process of intermediation which are hard to observe from outside the bank. Morgan (2002) argues that the financial nature of assets distinguishes banks from other firms. He argues that banking firms hold financial assets. Morgan (2002) argues that financial assets invite asset substitution problem whereby banks may exchange low risk assets for high risk investments. In addition, he argues that financial assets create collateral uncertainty for bank investors. However, Flannery, Kwan and Nimalendran (2004) do not find strong support to the notion that banks are more informationally "opaque" when compared to similarly matched non-financial firms.

In a similar vein, Levine (2004) posits that the quality of the bank loans is not readily observable to outsiders. Also, Levine (2004) argues that banks can hide problems by providing loans to clients at high interest rates who ultimately might not be in a position to service their debt obligations. Furthermore, banks can change the risk composition of their assets more readily and such changes might be hard to monitor from outside the bank. In other words, the complexity associated with banking business increases information asymmetries and hampers shareholders ability to effectively monitor decisions taken by the bank management.

Informational asymmetry characterizing banks is one of the major considerations that necessitates government supervision and regulation of banks. In this context, bank supervisors around the world are contemplating the incorporation of market discipline as part of the bank regulatory framework. However, supervisors and bank regulators must also be concerned about the effectiveness of market discipline. This is because the effectiveness of market discipline is to a large extent is dependent on making banks transparent to outside investors. In this regard, Flannery (1998) highlights that US regulators have expressed growing interest in the use of market-related oversight to augment their own methods of analysis to supervise large complex banking institutions. Flannery (1998) develops a model, and argues that systematically combining market and supervisory information will not only shorten the time lag to identify a problem bank, but also will persuade supervisors to act quickly in light of market information. Flannery (1998) argues that oversight of the banking firms can be improved if federal supervisors can systematically incorporate market information into their analysis and action plans. In this context, as emphasized by Basel Committee on Banking Supervision (BCBS), corporate governance mechanisms can help in improving monitoring efficiency.

Adams and Mehran (2003) is one of the few studies that provides a broad overview of the differences between corporate governance of bank holding companies and manufacturing firms. One of the central conclusions of their study is that corporate governance mechanisms are industry specific. Adams and Mehran (2003) document systematic differences in board size, board makeup, CEO ownership and compensation structure, and block ownership between manufacturing and banking firms. For example, Adams and Mehran (2003) document that on an average bank holding company boards

are larger than manufacturing firms. They also document that board composition is not significantly correlated with bank holding company performance. Similarly, Adams and Mehran (2003) document that CEO ownership, in terms of percentage of market value, is smaller in bank holding companies relative to manufacturing firms. This is consistent with the findings in Coles, Daniel and Naveen (2008) that corporate governance mechanisms are industry specific.

2.2.1. Corporate Governance and Information Asymmetry

Prior studies have shown that larger boards have a significantly negative impact on the firm value (For example, see, Yermack, 1996). Similarly, Eisenberg, Sundgren and Wells (1998) document a negative and significant correlation between board size and profitability in a sample of small and midsized Finnish firms. However, Adams and Mehran (2005) find no such relationship between board size and bank's performance (measured in terms of Tobin's Q for the bank sample). They attribute their findings to the complex organizational structure of large bank holding companies that necessitates larger boards. However, there is a tradeoff between the size of the bank's board and performance. Andres and Vallelado (2008) report an inverted U shaped relation between board size and bank performance. Using a sample of 69 boards of large commercial banks from Canada, France, the UK, Italy, Spain and the US for the period 1995 to 2005 Andres and Vallelado (2008) find that the upper limit of the inverted U shape is around 19 members. In other words, they show that when the number of directors reaches 19, bank performance (Tobin's Q) starts to diminish. Andres and Vallelado (2008) argue that inclusion of additional directors enhances the monitoring and advising role of the board

up to a certain level (around 19 members). However, beyond a certain level the problems due to control and coordination outweigh the benefits gained from enhanced monitoring and advising. The evidence in Adams and Mehran (2005) and Andres and Vallelado (2008) is consistent with the view that board size is a reflection of the scope and complexity of firm's operations (Fama and Jensen, 1983; Coles, Daniel and Naveen, 2008).

Jensen and Meckling (1976) develop a model to explain agency problems within the context of a firm. Their analysis provides a crucial insight on the relationship between managerial ownership and agency problems. They show that when managerial ownership is low, the agency problem is exacerbated and therefore, shareholders rely on external monitoring to mitigate agency problems. In a similar vein, DeYoung, Spong and Sullivan (2001) show that bank profitability depends on aligning the interests of hired managers with owners via managerial shareholdings.[2] In this context, Ofek and Yermack (2000) find that equity based compensation succeeds in increasing incentives of lower ownership managers. At the same time, firms characterized by severe informational asymmetries are more likely to use stock and option based compensation for CEOs (Demsetz and Lehn, 1985; Core and Guay,1999; Byran, Hwang and Lilien, 2000).

2.2.2. Financial Accounting Information, Information Asymmetry and Corporate Governance

Bushman and Smith (2003) synthesize major research findings in the accounting literature and emphasize financial accounting information as one important source of

[2] They study a sample of 266 small, closely held US commercial banks with broad range of ownership and management arrangements.

information available to outside investors and regulators. They argue that objective and verifiable accounting information not only facilitates in minimizing problems due to information asymmetries but also enables board of directors in advising, ratifying, and policing managerial decisions. Bushman and Smith (2003) argue that financial accounting information enhances financial performance of the firm by reducing the adverse selection and liquidity risk. Specifically, they argue that firm's willingness to disclose high quality financial accounting information reduces investor's risk of loss from trading with more informed investors. At the same time, prior studies have documented extensive use of accounting numbers in top executive compensation plans for publicly traded firms in the United States. For example, Murphy (1999) reports that a vast majority of firms in his sample explicitly use at least one measure of accounting profits in their annual bonus plans. Prior studies have also documented relationship between earnings performance and probability of executive turnover. These studies document an inverse relationship between accounting performance and CEO turnover (for example, see, Weisbach, 1988; DeFond and Park, 1999).

Bushman, Chen, Engel, and Smith (2000) posit that when current earnings fail to incorporate current value relevant information (i.e. when information is not timely), accounting numbers are less relevant in the governance setting. Lack of timely information might be associated with demand for firm specific information from inside directors and high-quality outside directors (Fama and Jensen, 1983). Consistent with this view, Bushman, Chen, Engel and Smith (2000) find that proportion of inside directors and high-quality outside directors are negatively related to timeliness of earnings.

Healy and Palepu (2001) provide a broad review of the voluntary disclosure literature. They enumerate potential managerial motivations behind disclosure decisions. One such motivation, the authors argue is in anticipation of capital market transactions. Since managers are likely to have superior information than investors, managers anticipating capital market transactions have an incentive to voluntarily disclose more to reduce asymmetric information and reduce cost of external financing.

Prior studies have also focused on analyzing relation between voluntary disclosure and corporate governance. For example, Eng and Mak (2003) examine the impact of ownership structure and board composition on voluntary disclosure. They find that lower managerial ownership and significant government ownership are associated with greater disclosure. They also find that increase in outside directors is associated with decrease in disclosure.

2.3. Hypotheses Development

Enhanced monitoring due to inclusion of additional board members signals the willingness of the management to subject their decisions to more scrutiny from board members. This increased scrutiny might facilitate transparency in decision making process and reduce information asymmetries. However, monitoring and advising benefits due to inclusion of additional board members might be limited by the problems due to control and coordination associated with large boards. In other words, at low levels of information asymmetries, including an additional board member might improve monitoring efficiency. However, as informational asymmetries increase benefits of

including an additional board member outweigh costs to coordination, control and communication. Preceding analysis leads to my first hypothesis.

Hypothesis 1: Ceteris paribus, there exists a nonlinear (inverted U shaped) relationship between board size and information asymmetry in banks.

The following regression model will be used to test the above hypothesis. The model predicts that the measure of information asymmetry (independent variable) is a determinant of board size (dependent variable) after controlling for other variables. Since, board size is a count data a Poisson distribution is assumed for the board size variable.[3] In Poisson regression it is assumed that the dependent variable (let's say Y) has a Poisson distribution given the independent variables (let's sayX_1, X_2... X_m).

Then, P(Y=k| X_1, X_2... X_m) = $e^{-\mu}\ \mu^k / k!$ where, k=0, 1, 2...

Since the dependent variable (Y) is $Boardsize_{i,t}$ in the model, the regression model can be written as

$$\mathrm{L}n(\mu_{i,t}) = \beta_0 + \beta_{1-5}IA_{i,t} + \beta_{6-10}IA_{i,t}^2 + \beta_{11}firmage_{i,t} + \beta_{12}\ln[totalassets_{i,t}] + \beta_{13}lagROA_{i,t} + \beta_{14}\ln[SubsidiariesAssets]_{i,t} + \beta_{15}CEOtenure_{i,t} + \beta_{16}CEOage_{i,t} + \beta_{17}Insiderownership + \beta_{18}Outsiderownership \quad (Model\ 1)$$

where,

$Boardsize_{i,t}$= Number of members on the board for i^{th} institution in year t.

[3] Poisson distribution was determined to be a better fit than Negative Binomial distribution based on AIC statistics.

$IA_{i,t}$= Five proxies of information asymmetry included in the model for i[th] institution in year t. A description about these five proxies is provided in Section 4.

Control Variables:

$firmage_{i,t}$= Number of years since i[th] institution was listed on CRSP in year t.

$totalassets_{i,t}$= Total assets for i[th] institution in year t.

$lagROA_{i,t}$=Lag of return on assets for i[th] institution in year t.

$SubsidiariesAssets_{i,t}$= Total assets of subsidiaries for i[th] institution in year t.

$CEOtenure_{i,t}$=Tenure of the CEO for i[th] institution in year t.

$CEOage_{i,t}$= Age of the CEO of i[th] institution in year t.

$Insiderownership_{i,t}$ = Average percentage of shares held by inside directors for i[th] institution in year t.

$Outsiderownership_{i,t}$ = Average percentage of shares held by outside directors for i[th] institution in year t.

Square terms of the control variables will also be included in the analysis. The effect of control variables may not be linear. For example, consider CEOtenure which is the tenure of the CEO at a particular institution. A squared term for the CEOtenure allows the effect of one-year increase in tenure to change as the tenure increases. In other words, the effect of tenure is not likely to remain same. For example, accessing the incremental impact of increase in CEO tenure from 14 years to 15 years may be very different from accessing the incremental impact of increase in CEO tenure from 1 year to 2 years.

This hypothesis predicts a nonlinear (an inverted U shaped) relationship between board size and a measure of information asymmetry. However, a significantly negative relationship need not necessarily suggest that an inverted U shaped relationship exists. This non-linear relationship is driven by the view that at high levels of informational asymmetries, benefits of monitoring due to including additional board members will be outweighed by the costs associated with coordination, control and communication of including additional board members.

2.3.1. Control Variables (Hypothesis 1)

As a measure of complexity of operations (Coles, Daniel and Naveen, 2008) total asset size is used in the model. In addition, the total asset size of the banking subsidiaries is used in the model to control for complexity of operations. Hermalin and Weisbach (1998) argue that as CEO approaches retirement, the board adds more insiders as part of succession process and this might alter board size and is likely to increase the board size holding other factors constant. Following Hermalin and Weisbach (1998) and Linck, Netter and Yang (2008), CEO tenure (proxy for perceived ability) and CEO age (proxy for length of time for retirement) are controlled for. Hermalin and Weisbach (1998) argue that board independence (and by implication board size) decrease with CEO's perceived ability (measured using CEO tenure) and imminence of CEO's retirement (measured by CEO age). Therefore, I expect a decrease in board size with an increase in CEO age and CEO tenure. Hermalin and Weisbach (1998) also posit that boards may add additional members following poor performance. In order to control for performance, lag of ROA (Return on Assets) is used in the model. I expect an increase in board size after a

poor performance keeping other factors constant. Prior studies (For example, Raheja (2005)) posit that director ownership in terms of insiders and outsiders is related to board size. In this regard, both insider (Insiderownership) and outsider (Outsiderownership) ownership are also controlled for. For example, Raheja (2005) argues that when the incentive alignment between insiders and shareholders is weak, the need for additional board members who are independent increases. Table 2.1 details the predicted signs for information asymmetry proxies and other control variables used to test the hypothesis.

Raheja (2005) models the relationship between verification costs and board composition. In Raheja's (2005) model, when verification costs are low (i.e. low levels of information asymmetry) more independent boards are shown to be optimal. However, when verification costs are high (i.e. high levels of information asymmetries), the number of outside directors optimally decreases in order to reduce coordination and higher verification costs. Similarly, prior evidence regarding corporate board structures seems to suggest that the number of outside directors decreases in the cost of monitoring. In this context, Maug (1997) shows that it is suboptimal for firms with high information asymmetry to invite monitoring from independent directors due to high costs associated with transferring firm specific information to outside directors. In such a scenario, keeping in view the relatively lower costs associated with transferring firm specific information to inside directors, inside directors might be better suited to monitor the management.

Hypothesis 2a: Ceteris paribus, there is a negative relationship between information asymmetry and board independence.

The following regression model will be used to test the above hypothesis. The model predicts that the proxies constructed to measure asymmetric information environment (independent variables) are a determinant of board independence (dependent variable) after controlling for other variables. Board independence is calculated as the ratio of independent directors to the total board size. Since, board independence is constrained between 0 and 100% the variable is transformed as follows:

$[Boardindependece_{i,t}] = [\frac{Proportion\_independent_{i,t}}{1-Proportion\_Independent_{I_{i,t}}}]$.

where $Proportion\_independent_{i,t}$ is the proportion of independent directors on the board for institution i in year t.

Logistic regression is used to test the hypothesis. The simple logistic regression predicts the value of dependent variable $Proportion\_independent_{i,t}$ for each value of the independent variables. The probability of board independence is constrained between 0 and 1. The limited range of this probability requires using a methodology such as logistic regression where natural logarithm of odds, $[\frac{Proportion\_independent_{i,t}}{1-Proportion\_Independent_{I_{i,t}}}]$, is used as the dependent variable.

The regression model is then written as:

$$\ln [Boardindependence]_{i,t}$$
$$= \beta_0 + \beta_{1-5} IA_{i,t} + \beta_6 firmage_{i,t} + \beta_7 \ln [totalassets_{i,t}] + \beta_8 lagROA_{i,t}$$
$$+ \beta_9 \ln [SubsidiariesAssets]_{i,t} + \beta_{10} CEOtenure_{i,t} + \beta_{11} CEOage_{i,t}$$
$$+ \beta_{12} Insiderownership + \beta_{13} Outsiderownership$$
$$+ \varepsilon_{i,t} \qquad (Model\ 2a)$$

The error term $\varepsilon_{i,t}$ is independent and normally distributed. Also, it is assumed that the error term is homoscedastic.

Where,

$Boardindependence_{i,t} = [\frac{Proportion\_independent_{i,t}}{1-Proportion\_Independent_{I_{i,t}}}]$.

$IA_{i,t}$= Five proxies of information asymmetry included in the model for i[th] institution in year t. A

description about these five proxies is provided in Section 4.

Control Variables:

$firmage_{i,t}$= Number of years since i[th] institution was listed on CRSP in year t.

$totalassets_{i,t}$= Total assets for i[th] institution in year t.

$lagROA_{i,t}$=Lag of return on assets for i[th] institution in year t.

$SubsidiariesAssets_{i,t}$= Total assets of subsidiaries for i[th] institution in year t.

$CEOtenure_{i,t}$=Tenure of the CEO for i[th] institution in year t.

$CEOage_{i,t}$= Age of the CEO of i[th] institution in year t.

$Insiderownership_{i,t}$ = Average percentage of shares held by inside directors for i[th] institution in year t.

$Outsiderownership_{i,t}$ = Average percentage of shares held by outside directors for i[th] institution in year t.

In terms of hypothesis 2a, I expect a linear and a negative relationship between board independence and measures of information asymmetry. This relationship is driven by the view that at high levels of information asymmetry it is difficult to transfer firm

specific information to outside (independent) directors and may prefer fewer independent directors on the board.

The relationship between information asymmetry and board independence might be non-linear. An argument can be made that some degree of board independence is desirable to effectively monitor and advise the management. At the same time, excessive board independence may impose high control and coordination costs which might hamper the functioning of board members to effectively monitor and advise the management. Preceding analysis leads to my next hypothesis.

Hypothesis 2b: Ceteris paribus, there exists a nonlinear (inverted U shaped) relationship between information asymmetry and board independence.

The following model will be used to test the above hypothesis. The model predicts that the measure of information asymmetry (dependent variable) is a determinant of board independence (dependent variable) after controlling for other variables.

Logistic regression is used to test the hypothesis. The simple logistic regression predicts the value of dependent variable $Proportion\_independent_{i,t}$ for each value of the independent variables. The probability of board independence is constrained between 0 and 1. The limited range of this probability requires using a methodology such as logistic regression where natural logarithm of odds, $[\frac{Proportion\_independent_{i,t}}{1-Proportion\_Independent_{I_{i,t}}}]$, is used as the dependent variable.

The regression model can be written as:

$$\ln [Boardindependence_{i,t}]$$

$$= \beta_0 + \beta_{1-5} IA_{i,t} + \beta_{6-10} IA_{i,t}^2 + \beta_{11} firmage_{i,t} + \beta_{12} \ln [totalassets_{i,t}]$$

$$+ \beta_{13} lagROA_{i,t} + \beta_{14} \ln [SubsidiariesAssets]_{i,t} + \beta_{15} CEOtenure_{i,t} + \beta_{16} CEOage_{i,t}$$

$$+ \beta_{17} Insiderownership + \beta_{18} Outsiderownership$$

$$+ \varepsilon_{i,t} \qquad (Model\ 2b)$$

The error term $\varepsilon_{i,t}$ is independent and normally distributed. Also, it is assumed that the error term is homoscedastic.

where,

$Boardindependence_{i,t}$= $[\frac{Proportion\_independent_{i,t}}{1-Proportion\_Independent_{I_{i,t}}}]$.

$IA_{i,t}$= Five proxies of information asymmetry included in the model for i[th] institution in year t. A description about these five proxies is provided in Section 4.

Control Variables:

$firmage_{i,t}$= Number of years since i[th] institution was listed on CRSP in year t.

$totalassets_{i,t}$= Total assets for i[th] institution in year t.

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$CEOage_{i,t}$= Age of the CEO of i[th] institution in year t.

$Insiderownership_{i,t}$ = Average percentage of shares held by inside directors for i[th] institution in year t.

$Outsiderownership_{i,t}$ = Average percentage of shares held by outside directors for ith institution in year t.

Alternatively, hypothesis 2b predicts a non-linear (inverted U shaped) relationship between board independence and measures of information asymmetry.

2.3.2. Control Variables (Hypotheses 2a and 2b)

As with board size, as a measure of complexity of operations total asset size (Coles, Daniel and Naveen, 2008) and the asset size of non-banking subsidiaries will be used in the model. Hermalin and Weisbach (1998) argue that as CEO approaches retirement, the board adds more insiders as part of succession process and this might alter board composition and is likely to increase the board independence holding other factors constant. Following Hermalin and Weisbach (1998) and Linck, Netter and Yang (2008), CEO tenure (proxy for perceived ability) and CEO age (proxy for length of time for retirement) are controlled for. Hermalin and Weisbach (1998) argue that board independence decrease with CEO's perceived ability (measured using CEO tenure) and imminence of CEO's retirement (measured by CEO age). Therefore, I expect a decrease in board independence with an increase in CEO age and CEO tenure. Hermalin and Weisbach (1998) also posit that boards may add additional members following poor performance. However, it is not clear whether the additional board members will be insiders or independent directors. In order to control for performance, lag of ROA (Return on Assets) is used in the model. The board independence may increase or decrease after a poor performance keeping other factors constant. Prior studies (For

example, Raheja (2005)) posit that director ownership in terms of insiders and outsiders is related to board size. In this regard, both insider (Insiderownership) and outsider (Outsiderownership) ownership are also controlled for. For example, Raheja (2005) argues that when the incentive alignment between insiders and shareholders is weak, the need for additional board members who are independent increases. Table 2.2 and Table 2.3 details the predicted signs for information asymmetry proxies and other control variables used to test hypothesis 2a and hypothesis 2b respectively.

Theoretical models (for example, see, Holmstrom and Milgrom, 1994) posit that the difficulty associated with monitoring managerial performance has a bearing on the compensation contracts. When firms are characterized by severe informational asymmetries it is difficult for members of the board and shareholders to discern the information available to the CEOs. Since CEOs cannot diversify their human capital, they might be risk-averse and might not implement risky yet value enhancing decisions. On the other hand, it is in the interest of the shareholders that CEOs undertake such risky and value enhancing decisions. This is because shareholders can account for the risk by diversifying their investment portfolios. In this context, banks faced by severe informational asymmetries might offer CEOs with greater incentive based stock option awards. Incentive based compensation is measured as a ratio of granted options to total compensation.

Hypothesis 3: Ceteris paribus, there is a positive relationship between CEO stock option based awards and opacity in the banking industry.

The following model will be used to test the above hypothesis. The model predicts that the proxies constructed to measure asymmetric information environment (independent variables) are a determinant of CEO option awards (dependent variable) after controlling for other variables. CEO option awards are calculated as the ratio of options granted to the total compensation. Since, CEO option awards are constrained between 0 and 100% the variable is transformed as follows:

$$[CEOOptionawards_{i,t}] = [\frac{Proportion\_Options_{i,t}}{1-Proportion\_Options_{I_{i,t}}}]$$

Where, $Proportion\_Options_{i,t}$ is the proportion of option awards to total CEO compensation for institution i in year t.

Logistic regression is used to test the hypothesis. The simple logistic regression predicts the value of dependent variable $Proportion\_Options_{i,t}$ for each value of the independent variables. The probability of CEO stock option based compensation is constrained between 0 and 1. The limited range of this probability requires using a methodology such as logistic regression where natural logarithm of odds, $[\frac{Proportion\_Options_{i,t}}{1-Proportion\_Options_{I_{i,t}}}]$, is used as the dependent variable.

The regression model can be written as:

$$Ln[CEOOptionawards_{i,t}]$$
$$= \beta_0 + \beta_{1-5} IA_{i,t} + \beta_6 \ln [SubsidiariesAssets_{i,t}] + \beta_7 \ln [totalassets_{i,t}]$$
$$+ \beta_8 CEOtenure_{i,t} + \beta_9 CEOage_{i,t} + \beta_{10} lagROA_{i,t}$$
$$+ \varepsilon_{i,t} \qquad (Model\ 3)$$

The error term $\varepsilon_{i,t}$ is independent and is normally distributed. Also, it is assumed that the error term is homoscedastic.

Where,

$[CEOOptionawards_{i,t}] = [\frac{Proportion\_Options_{i,t}}{1-Proportion\_Options_{I_{i,t}}}]$.

$IA_{i,t}$= Five proxies of Information asymmetry for i[th] institution in year t. A description about these five proxies is provided in Section 4.

Control Variables:

$totalassets_{i,t}$= Total assets for i[th] institution in year t.

$SubsidiariesAssets_{i,t}$= Total assets of subsidiaries for i[th] institution in year t.

$CEOtenure_{i,t}$= Tenure of the CEO for i[th] institution in year t.

$CEOage_{i,t}$= Age of the CEO of i[th] institution in year t.

Hypothesis 3 predicts a linear and positive relationship between CEOOptionawards and information asymmetry. This prediction is driven by the view that banks characterized by severe informational asymmetries will prefer stock based compensation to align the interests of managers and shareholders.

2.3.3. Control Variables (Hypothesis 3)

As a measure of complexity of operations (Coles, Daniel and Naveen, 2008) total asset size and total asset size of subsidiaries will be used in the model. More complexity may be associated with difficulty in monitoring the performance of CEO and may lead to higher CEO stock option based compensation. To control for CEO risk aversion, CEO

age and CEO tenure are controlled for. For instance, Berger et al (1997) posit that CEOs with long tenures might be more entrenched and may be more risk averse. This in turn might require more option based compensation to incentivize a risk averse CEO. On the other hand, due to long tenure (perceived ability), CEO may be in a position to influence the decision of the board and may receive proportionately lower stock option based compensation. Finally, bank performance is controlled by including lagged ROA in the model. Poor performance may lead to increase in CEO stock option based compensation so as to align the interests of CEO with that of shareholders Table 2.4 details the predicted signs for information asymmetry proxies and other control variables used to test hypothesis 3.

2.4. Measures of Information Asymmetry

2.4.1. Quasi-Market Based Measure

2.4.1.1. Credit Rating Disagreements (RatingsGap)

Morgan (2002) argues that the disagreement between bond raters proxies for uncertainty and if bank risk is harder to observe from outside the bank, the raters should disagree more when compared to other industries. Consistent with this argument, Morgan (2002) finds that bond raters disagree more often on bonds issued by banks and insurance companies than bonds issued by firms in other industries. Morgan (2002) posits that the disagreement between bank raters over bond issues is partly due to banks' underlying assets. Following Morgan (2002), relative opacity of banks is computed using disagreement between the major bond rating agencies (Moody's and Standard and Poor's) as a proxy for

uncertainty. As in Morgan (2002), the letter ratings of the two agencies will be mapped to a single numeric scale, with better letter ratings corresponding to lower numbers. For example, new bond issues with a rating of AAA (S&P) or Aaa (Moody's) will be assigned a value of 1. Similarly, new bond issues with a rating of AA+ (S&P) or Aa1 (Moody's) will be assigned a value of 2 and so on. Absolute mean difference between the ratings assigned by S&P and Moody's (0, 1, 2, 3 +) will be used as a proxy for information asymmetries (i.e. greater the difference, greater is the degree of information asymmetry).

2.4.2. Market-Based Measures

2.4.2.1. Analyst Earnings (EPS) Forecast Errors (EPSforecasterrors)

Analyst earnings forecast errors (Earnings per Share) may be less accurate and more dispersed for "opaque" firms (Flannery, Kwan and Nimalendran, 2004). Cross sectional variance of analysts' forecasts will also be used as a proxy for information asymmetry.

2.4.2.2. Bid-Ask Spread (BidAskSpreads)

The effects of information asymmetry might be reflected in the bank's equity trading features (Flannery, Kwan and Nimalendran, 2004). The underlying rationale is that due to better information bank insiders and specialists are in a better position to accurately value bank assets. On the other hand, outside investors who are not as well informed as bank insiders are unable to accurately value the bank assets. Following Flannery, Kwan and Nimalendran, 2004), the average quoted spread (AQS) in effect for transactions during the year will be

used as a proxy for information asymmetry. The spreads will be computed for last quarter of each year for all banks during the sample period.

2.4.3. Accounting Measures (ALL/Assets and PLL/Assets)

Liao, Kang, Morris and Tang (2010) find that loan loss provisions for U.S. banks is associated with information asymmetry. They show that both Allowance for Loan Loss account (ALL) and Provision for to Loan Loss (PLL) account are positively and significantly associated with measures of information asymmetry.[4] In this context, both ALL and PLL accounts (divided by total assets) are used as accounting measures of information asymmetry.

All five measures of information asymmetry mentioned in this section above will be used simultaneously at a time in the model to determine relative importance of these measures as proxies for information asymmetries. All five measures are assumed to be useful proxies for measuring information asymmetries in the banking industry and no one measure is assumed to be a better measure than others at this stage.

2.5. Methodology

The data for the analysis comprises of both time-series and cross-sectional observations (unbalanced panel data). Another feature of the data is the repeated observations in the sample over time. Panel data models are employed to examine fixed and/or random effects. Since panel data consists of repeated observation over time,

[4] ALL account appears on the balance sheet and PLL is reported in the income statement. ALL and PLL are closed related. ALL is an accumulated account for each period's PLL.

fixed/random models allow us to examine the relevant changes, if at all any, with in the bank over time. The regression models without the fixed/random effects only allow us the examine the cross sectional affects across the bank and not with the bank over time. The major difference between the fixed effects models and the random effects models lies in the way the dummy variables are treated. For fixed effects models, dummy variables are considered part of the intercept. In a fixed effects model, unobserved differences between individual banks are set as a set of fixed parameters than can either be directly estimated, or partialed out of the estimating equations. On the other hand, for random effect models, the dummy variables[5] are subsumed in the error term (Park 2009; Allison 2006).

For this study, a fixed group effects model is employed to examine the group differences in intercepts, assuming same slopes and constant variances across banks. In terms of model specification, let Y_{it} be the dependent variable. Let the vector x_{it} represent the set of variables that vary over time and another set of predictor variables z_i that do not vary over time.

The model can be written as:

$$Y_{it} = \mu_t + \beta x_{it} + \Upsilon z_i + \alpha_i + \varepsilon_{it}$$

Where, μ_t is an intercept that is allowed to be different for each point in time. In addition, β and γ are vectors of coefficients. And of the two "error" terms $\alpha_i \ and \ \varepsilon_{it}$, ε_{it} varies for each individual bank over each point in time. Whereas, α_i only varies across individual banks and not across time.

[5] SAS software is used for the analysis. GENMOD, GLIMMIX and PANEL procedures were used among other procedure for the analysis. The dummy variables for each institution and year are automatically generated by the procedures used.

In addition to further validate the fixed effects model assumption, a Hausman (1978) test was used to reject a random effects model. Since, the study has the additional time component, a two-way fixed effect model is used. The two-way model considers two components. The first component is the cross-sectional component for individual institutions. The second component is the year. The fixed effects models have the attractive feature of controlling for all stable characteristics of the banks included in the study whether measured or not. This can be accomplished by observing within bank variations over time to estimate the regression coefficients.

The first hypothesis in the study analyzes the role of the information environment on the bank's board size. Since, board size is a count variable, fixed effect model is implemented using a Poisson regression to test the hypothesis. Specifically, both Poisson regression and Negative Binomial models were considered for the analysis. Poisson model was shown to be a better fit based on AIC statistics and will be reported below.

Logistic regression is used to test the hypotheses 2a and 2b. The simple logistic regression predicts the value of dependent variable $Proportion\_independent_{i,t}$ for each value of the independent variables. The probability of board independence is constrained between 0 and 1. The limited range requires using a methodology such as logistic regression where natural logarithm of odds,$[\frac{Proportion\_independent_{i,t}}{1-Proportion\_Independent_{I_{i,t}}}]$, is used as the dependent variable.

Again, logistic regression is used to test the hypothesis 3. The simple logistic regression predicts the value of dependent variable $Proportion\_Options_{i,t}$ for each value of the independent variables. The probability of CEO stock option based

compensation is constrained between 0 and 1. The limited range requires using a methodology such as logistic regression where natural logarithm of odds, $[\frac{Proportion\_Options_{i,t}}{1-Proportion\_Options_{I_{i,t}}}]$, is used as the dependent variable.

2.6. Data and Sample Construction

The sample period spans the years from 2001 to 2005. The banks in the sample are collected from the COMPUSTAT bank database. To be part of the sample, the banks should have NAICS code 522110 (Commercial Banking) and be incorporated in the United States. For each year in the sample, top 100 largest banks or bank holding companies sorted by asset size are included in the sample. In the present study, the largest 100 banks by asset size are re-selected each year from 2001 through 2005. Very few banks in the sample do not re appear in later years mainly due to mergers and takeovers. However, overwhelming majority of the banks remain in existence throughout the sample period.

The governance data for the banking institutions is collected from Corporate Library and RiskMetrics© database. The missing data is hand collected from the proxy statements. The CEO compensation data including CEO option awards data is collected from the Executive Compensation database. The CEO compensation data is hand collected wherever the data is not available electronically. The total assets held by large banks constitute a very large fraction of the total industry assets. Effects of poor governance mechanisms for these banks could be potentially destabilizing for the entire economy. Each year during the sample period, large banks (by asset size) were resampled

based on the asset size during that particular year. Also, survivorship bias should not be a serious concern in the banking industry, as the FDIC generally does not allow large bank holding companies to fail (Boyd and Runkle, 1993). As mentioned above, the largest 100 banks by asset size are re-selected each year from 2001 through 2005. And an overwhelming majority of the banks remain in existence throughout the sample period.

The study uses five different measures of information asymmetry. Credit rating disagreements data is collected from the SDC database. Specifically, credit ratings assigned by S&P and Moody's rating agencies are used in the study. Data for analyst earnings (EPS) forecast errors is collected from IBES database. The Bid-Ask spread data for the bank's stocks is collected from NYSE TAQ database. Finally, the two accounting measures used in the analysis allowance for loan losses (ALL) and provision for loan losses (PLL) are collected from the bank call report data available on Federal Reserve Bank of Chicago's website. Specifically, variables BHCK 3123 (ALL) and BHCK 4230 (PLL) are used in the analysis.

2.7. Results

2.7.1. Descriptive Statistics

Table 2.5A and Table 2.5B provide descriptive statistics (number of observations, mean, median, minimum, maximum, standard deviation, skewness and kurtosis) for the governance variables and proxies for information asymmetry respectively used in the study. The mean (median) board size is 13.88 (13.00) directors per board. Also, the mean (median) proportion of independent directors on the board is 71% (73%). To provide a perspective, Adams and Mehran (2003) report a mean board size of 18.00 and a mean

board independence of 68.7 % for the sample banks during the sample period 1986-1999. Adams and Mehran (2003) also report a decline in average board size and an increase in average board independence for large banks during their sample period. In this context, it is important to note that the increase in the bank board independence over time appears to be taking place since the mid-1980s and is not just a consequence of external regulation such as Sarbanes-Oxley act of 2002.

In terms of information asymmetry proxies, the mean (median) maximum of the RatingsGap is 0.38 (0.00). Among very large banks considered in this study, only a selected few banks issue securities that are rated regularly by multiple credit rating agencies. Since many banks do not have multiple credit ratings for their issuances, a RatingsGap of 0.00 is assigned to such banks and explains a median RatingsGap of 0.00. This is a limitation of this study since many banks in the sample do not have credit rating disagreements data. Nonetheless, it appears to be a useful proxy for the information environment in the banking industry wherever the data is available. The mean (median) quoted bid-ask spread is $0.25 ($0.18) during the sample period. The standard deviation of mean (median) EPS forecast errors are $0.07($0.04). The mean ALL/Assets and PLL/Assets are 1% and 0.03% respectively.

Table 2.6 details the summary statistics for the control variables used in the study. The mean ownership stake of outside directors (3.83%) is a little higher than ownership stake of inside directors (3.68%). At the same time, the median insider ownership is relatively small at only 0.71%. The mean (median) CEO age and CEO tenure are 55.48 (56.00) year and 8.95 (6.00) years respectively. The mean age of the bank since incorporation is 43.91 years. In addition, the mean total asset size of the banks during the

sample period is $42.19 billion. The median total asset size is $10.18 billion during the sample period. Similarly, the mean (median) asset of the subsidiaries during the sample period is $4.03 billion ($0.12 billion). Both the asset size variables are positively skewed. In order to address the issue of non-normality, natural logarithm of these variables were used for the regression analysis.

Table 2.7 details the Pearson correlation coefficients among proxies of information asymmetry used in the study. EPSforecasterrors is positively and significantly correlated with both accounting measures (ALL/Assets and PLL/Assets) used in the study. In a similar fashion, RatingsGap (Max) is also positively and significantly correlated with ALL/Assets (10% level) and PLL/Assets (1% level). Since some of the proxies of information asymmetry are correlated to a degree, it raises concerns about multicollinearity. In order to address the issue of multicollinearity, Variance Inflation Factors (VIFs) were calculated for all the independent variables used to test the hypotheses in the study. A detailed description of the potential problems associated with multicollineartiy, and the steps taken in this study to address the potential problems associated with multicollineartiy is provided in the next section.

2.7.2. Multicollinearity

Multicollinearity exits when the independent variables included in the regression model are significantly correlated. Multicollinearity does not involve the dependent variable. More importantly, the existence of multicollinearity does not violate any regression assumptions. However, multicollinearity may cause larger variances of parameter estimates. In other words, the existence of multicollinearity implies that the

estimates of the parameters tend to be less precise and will tend to have insignificant tests and wide confidence intervals (Mansfield and Helms (1982)).

In this study, the proxies for information asymmetry are to some extent correlated. Therefore, including all the variables in one model at the same time may raise concerns about multicollinearity. In order to address this issue, Variance Inflation Factors (VIFs) were calculated for independent variables used in the model. Among the proxies used for information asymmetry, ALL/Assets and the squared term of ALL/Assets recorded VIFs of 19.67 and 22.29 respectively, well above the generally accepted limit of 10.00. In order to address this issue of multicollinearity, both ALL/Assets and the squared term of ALL/Assets were dropped from the model. These results are reported next to the full model estimates which includes ALL/Assets and its squared term. In addition to ALL/Assets and the squared term of ALL/Assets, control variables CEOage and the square of CEOage, firm age and the square of the variable firm age, Lag (ROA) and its square term recorded VIFs greater than 10.00. Therefore, the model was rerun by dropping these control variables along with ALL/Assets and its squared term. These results are reported along with the full model results in the respective tables.

2.7.3. Regression Analysis

2.7.3.1. Information Asymmetry, Corporate Governance, and Bank Board Size

Table 2.8 reports the Poisson regression results from estimating Model 1.[6] In (Model 1)[a] , ALL/Assets and the squared term of ALL/Assets are dropped from (Model 1). In (Model 1)[b] , and in addition to ALL/Assets and the squared term of ALL/Assets, control variables CEOage and the square of CEOage, firmage and the square of the variable firmage, Lag (ROA) and its square term are dropped for (Model 1). The independent variable in all the three reported models is the BoardSize. The discussion of the results will mainly focus on (Model 1)[b] where multicollinearity is not a major concern.

The primary variables of interest in the model are the information asymmetry proxies. The dependent variable BoardSize is a count variable, and Poisson regression models the log of the expected count as a function of the predictor variables. The interpretation of Poisson regression coefficients is that for a one unit change in the predictor variable, the difference in the logs of expected counts is expected to change by the respective regression coefficient, given the other predictor variables in the model are held constant. Hypothesis 1 predicts a negative and significant coefficient for square terms of all information asymmetric variables. From (Model 1), Poisson regression estimates a one unit increase in BidAskSpread Squared, the difference in the logs of expected BoardSize would be expected to decrease by 0.4917, while holding the other variables in the model constant. This result is consistent even when variables with high variance inflation factors (>10.00) are dropped from the model. For example, when all

[6] SAS software was used for the analysis. Specifically, GENMOD procedure was used for the analysis. This particular analysis does not consider bank and time fixed effects. Results using bank fixed effects and time fixed effects are reported in Table 5.

independent variables with variance inflation factors greater than 10 are dropped from the model, a one unit increase in BidAskSpread Square, the difference in the logs of expected BoardSize would be expected to decrease by 0.5507. The coefficient 0.5507 in itself is not meaningful for interpretation. In order to better interpret the parameter estimates in terms of changes to board size, board size was computed for different values of BidAskSpread and BidAskSpread squared term. The relationship between board size and BidAskSpread is depicted in Figure 2.1. Other measures of information asymmetry used in the model, RatingsGap (0.5753), EPSforecasterrors (0.3990) and PLL/Assets (0.2045) are not statistically significant in (Model 1)[b] (p-values reported in the parentheses to indicate the level of significance). These results taken together generally suggest that BidAskSpread is unambiguously the best measure of information asymmetry in the model.

Figure 2.1 confirms the non-linear nature of the relationship between BoardSize and BidAskSpread. Specifically, Figure 1 documents an inverted U shaped relationship between measure of information asymmetry (BidAskSpread) and bank board size. In order to make sense of the overall results reported in Table 2.8, log (BoardSize) was estimated for different values of BidAskSpread. Anti-log of the estimated log (BoardSize) was calculated to arrive at the estimated board size for different values of BidAskSpread. From Figure 2.1, we can see that for $0.05 BidAskSpread, the estimated board size for the bank is 12.70 members. The board size peaks at a BidAskSpread of $0.65 at 15.51 members. The board size declines from this point with an increase in BidAskSpread. For example, for a BidAskSpread of $1.5, the bank board size declines to 10.44 board members holding other factors constant at their mean values. These results

hold true over a cross section of different banks. These results cannot be generalized for within the bank over time. In order to see if such a pattern holds, fixed effects model was estimated and the results reported later.

In terms of other information asymmetry proxies, PLL/AssetsSquare is generally statistically significant at 5% level in (Model 1)[b]. However, the linear term is not significant in the model.

In addition, the results reported in Table 2.8 show that bank's board size increases for larger banks (Log (Assets)) holding other factors constant. The bank board size increases with an increase in outside director ownership holding other factors constant. For example, an increase in average outside director ownership by one percentage point from 1% to 2% increases the board size from 13.39 members to 13.56 members holding all other factors constant at their mean. Raheja (2005) argues that the boards will be smaller when insiders' and shareholders' incentives are aligned. This is because, when such alignment exists, need for external monitors declines, leading to smaller boards. In this context, keeping other factors constant, greater outsider ownership suggests a relatively weaker incentive alignment between insiders and shareholders. This suggests the need for enhanced monitoring. Therefore, a positive relationship between board size and outside director ownership is consistent with the predictions made in theoretical model proposed by Raheja (2005).

Table 2.9 reports the Poisson regression results from estimating Model 1, incorporating both bank and time fixed effects.[7] In (Model 1)[a] reported in Table 5,

[7] SAS software was used for the analysis. Both procedures GENMOD and GLIMMIX were used for this purpose. These procedures generate dummy variables for bank and

ALL/Assets and the squared term of ALL/Assets are dropped from (Model 1). In (Model 1)[b] reported in Table 2.9, in addition to ALL/Assets and the squared term of ALL/Assets, control variables CEOage and the square of CEOage, firmage and the square of the variable firmage, Lag (ROA) and its square term are dropped for (Model 1). Again, the dependent variable in all the three reported models is BoardSize. Comparing the parameter estimates reported in Table 2.9 to those of Table 2.9, none of the measures of information asymmetry are statistically significant. Even though the parameter estimates reported in Table 2.9 are not statistically significant, this is still an important result. This is because, variation in board size observed in Table 2.8 was observed across banks and not within a bank over a period of time. Based on the results reported in Table 2.8 and Table 2.9, it appears that within a bank, bank board size changes are less frequent in response to information environment.

2.7.3.2. Information Asymmetry, Corporate Governance, and Bank Board Independence

Table 2.10 reports the results from estimating the logistic regression model defined in Model 2a, testing the second hypothesis concerning board independence.[8] In (Model 2a)[a] reported in Table 6, ALL/Assets and the squared term of ALL/Assets are dropped from (Model 2a). In (Model 2a)[b] reported in Table 2.10, in addition to ALL/Assets and the squared term of ALL/Assets, control variables CEOage and the

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time fixed effects. Between Poisson regression model and Negative Binomial model, Poison regression generated a lower AIC fit statistic.

[8]SAS software was used for the analysis. Specifically, PANEL procedure with bank and time fixed effects was used for the analysis. The fit statistics (F- Values) for the model used are reported in respective tables.

square of CEOage, firmage and the square of the variable firmage, Lag (ROA) and its square term are dropped for (Model 2a). Table 2.10 reports the relationship between bank board independence and information asymmetry without the nonlinear assumption. In this analysis, BoardIndependence is the dependent variable. As is evident from the results reported in Table 2.10, none of the measures of information asymmetry are significant in the three different models estimated and reported. As stated in hypothesis 2a, a negative relationship between measures of information asymmetry and board independence was predicted. As is evident from the results reported in table 2.10, the coefficients of measures of information asymmetry are positive and not significant at conventional levels. For example, the coefficients of BidAskSpread, EPSforecasterrors, PLL/Assets reported in (Model 2a)[b] are 0.0874, 0.4013, 0.0106 and 10.659 respectively. None of the coefficients of information asymmetry used in the model are significant. Also the reported coefficients have positive sign instead of the predicted negative signs. Only the log (SubsidiariesAssets) with a negative coefficient (-0.0471) is significant at 5% level. Overall, hypothesis 2a is emphatically rejected, where no nonlinear relationship was assumed between bank board independence and measures of information asymmetry. In other words, a linear relationship between board independence and measures of information asymmetry could not be established. Therefore, including only linear terms as measures of information asymmetry in the analysis may lead us to conclude that information environment has no bearing on bank board independence. However, drawing such a conclusion may be flawed at this stage, as the relationship between measures of information asymmetry and board independence may be nonlinear, as hypothesized in hypothesis 2b.

Table 2.11 reports the results from estimating the logistic regression model defined in Model 2b allowing for non-linearity.[9] For (Model 2b)[a] reported in Table 2.11, ALL/Assets and the squared term of ALL/Assets are dropped from (Model 2b). Again for (Model 2b)[b] reported in Table 2.11, in addition to ALL/Assets and the squared term of ALL/Assets, control variables CEOage and the square of CEOage, firmage and the square of the variable firmage, Lag (ROA) and its square term are dropped for (Model 2b). Table 2.11 reports the relationship between bank board independence and measures of information asymmetry with the nonlinear assumption. In this analysis, again BoardIndependence is the dependent variable.

Table 2.11 details the logistic regression model of BoardIndependence on measures of information asymmetry and other control variables as in Table 4. The coefficient of RatingsGapSquare (-0.1147) is negative and significant at 5% level in (Model 2b). This result is robust and significant (-0.0994) to alternative specifications, when independent variables with variance inflation factors greater than 10.00 were dropped from (Model 2b)[b]. Considering the control variables, keeping other variables constant, bank board independence decreases (-0.0455) with increase in complexity of operations (Log(SubsidiariesAssets)). One other proxy of information asymmetry BidAskSpread has a positive coefficient (1.0882) and is statistically significant at 10%, but not at the conventional 5% level. In order to interpret the level of the coefficients in terms of bank board independence, ln $[Boardindependence_{i,t}]$ is calculated for

[9] SAS software was used for the analysis. Specifically, PANEL procedure with bank and time fixed effects was used for the analysis. The fit statistics (F- Values) for the model used are reported in respective tables.

different values of RatingsGap and RatingsGapSquare for (Model 2b)[b] and other parameter estimates with variables held at their mean values. The resultant relationship between bank board independence and RagingsGap is depicted in Figure 2.2.

Figure 2.2 documents a nonlinear relationship between board independence and credit rating disagreements within a bank over the sample period. Specifically, Figure 2.2 documents an inverted U shaped relationship between measure of information asymmetry (RatingsGap) and bank board independence as predicted in hypothesis 2b.[10] In order to make sense of the overall results reported in Table 2.11, bank board independence was calculated for different values of RatingsGap. From Figure 2.2, we can see that when the RatingsGap is 0.00, the estimated board independence for the bank is 66.87%. The board independence peaks with 74.03% at a RatingsGap of 1.86. The board independence declines from this point with an increase in RatingsGap. For example, for a RatingsGap of 3.00, the bank board independence declines to 71.48% holding other factors constant at their mean values. Based on these results, it appears that the changes to board independence appear to be more responsive to information environment and are frequent within a bank over the sample period.

Again from Table 2.11, Log (SubsidiariesAssets) is negative and significant at 5% level. In this study, Log (SubsidiariesAssets) is used as a proxy for complexity of bank operations. In other words, it appears that banks prefer a less independent and a more cohesive group as the complexity of operations increases. The coefficient of OutsideOwnership is 0.0329 in the model with no VIFs above the value of 10.00. Also, in

[10] Wilmington Trust Corporation was selected as the bank holding company from the sample for within the bank analysis since its median asset size was close to the sample median.

this model, the coefficient of OutsiderOwnershipSquare is -0.00045. Both these coefficients are statistically significant at 5% and 10% respectively. As calculated, an increase in OutsideOwnership from 1% to 2% increases the board independence from 66.74% to 67.46% holding other factors constant at their mean. In a similar manner, an increase in OutsideOwnership from 3% to 4% increases the board independence 68.18% to 68.89% holding other factors constant at their mean. This result is again consistent with the prediction made by Raheja (2005). In other words, keeping other factors constant, greater outsider ownership implies a relatively weaker incentive alignment between insiders and shareholders. This weakened alignment between insiders and shareholders necessitates the need for increased monitoring. Therefore, a positive relationship between board independence and outside director ownership is consistent with Raheja (2005).

2.7.3.3. Information Asymmetry, Corporate Governance, and CEO Stock Option Based Compensation

Table 2.12 reports the results from estimating the logistic regression model defined in Model 3. As before, (Model 3)[a] reported in Table 2.12, ALL/Assets and the squared term of ALL/Assets are dropped from (Model 3). In (Model 3)[b] reported in Table 2.12, in addition to ALL/Assets and the squared term of ALL/Assets, control variables CEOage and the square of CEOage, firmage and the square of the variable firmage, Lag (ROA) and its square term are dropped for (Model 3).[11]

[11] SAS software was used for the analysis. Specifically, PANEL procedure with both bank and time fixed effects was used for the analysis. The fit statistics (F- Values) for the model used are reported in respective tables.

Table 2.12 reports the relationship between CEOOptionawards and measures of information asymmetry. None of the measures of information asymmetry used in the study show up to be significant. The only variable which is significant is CEOTenure (-0.03). This suggests that CEOs with longer tenure are relatively less likely to be offered option based compensation as a proportion of total compensation keeping other factors constant. However, it appears that this result is not economically significant. For example, if a CEO with tenure of 3 years receives 75.03% of his compensation in stock option awards, then the same CEO with tenure of 4 years will receive 74.46% of compensation in stock option awards keeping all other factors constant. Even though the coefficient -0.03 is statistically significant, it does not appear to be economically significant. Taken in its entirety, the findings reported in Table 2.12 reject hypothesis 3. The findings reported in Table 2.12 offer no evidence to support the notion that propensity to offer stock option based compensation as a proportion of total compensation increases in an informationally opaque environment.

2.8. Contributions and Limitations

Conventional wisdom seems to suggest that large banking organizations are characterized by severe informational asymmetries. If some banks are indeed characterized by severe informational asymmetries, theoretical models make specific predictions regarding how governance mechanisms should manifest themselves. Findings of this study are consistent with the view that information environment has an influence in shaping certain governance mechanisms for large complex banking organizations.

First, this is one of the very few studies that documents corporate board characteristics of large banking institutions in US over a 5 year period from 2001 to 2005. Most of the data used in the study was hand collected and is not readily available. The study documents the corporate governance mechanisms in terms of bank board size, bank board independence and CEO option based compensation for large US banking firms. Second, the study considers potential proxies for measuring information asymmetry. The results of the study show that quasi-market based (RatingsGap) and market based (BidAskSpread) measures are useful proxies as they partly help explain the evolution of bank board size and bank board independence in an asymmetric information environment in the banking industry. In other words, these findings attest to the fact that the information environment has a bearing on the bank board size and bank board independence.

The study documents a non-linear relationship between BidAskSpread and RatingsGap and bank board size and bank board independence respectively. Specifically, the study documents an inverted U shaped relationship between a measure of information asymmetry (BidAskSpread) and bank board size across the banks in the sample. The board size peaks at 15.44 members. However, it is also important to stress that no such relationship was found within the bank over 5 year period. Similarly, the study also documents an inverted U shaped relationship between bank board independence and credit ratings disagreements. For example, for a sample bank, the board independence declines to around 71.48% from a peak of 74.03% for a credit rating disagreement gap of 3.00 holding other factors constant at their mean. In other words, it appears that within a bank, board size changes are less frequent in response to information environment. On

the other hand, changes to board independence appear to be more responsive to information environment and are frequent within a bank over the sample period. However, no strong connection between CEO option based compensation in an informationally opaque environment was found.

The study also documents a positive relationship between board size and outside director ownership. In a similar manner, the study also documents a positive relationship between board independence and outside director ownership. The positive relationship between outside director ownership board size and board independence is consistent with the view that when incentive alignment between insiders and shareholders is relatively weak, the need for external monitoring by means of additional board members who are independent directors increases.

Evidence regarding the existence of governance mechanisms and their relationship with information environment within the banking industry should interest policy makers and bank regulators in US who are concerned about the ability of the market to discipline large complex banking firms.

One major limitation of the study is that the analysis is confined to large complex banking organizations and the results need not necessarily be applicable for smaller community banks. This is because banks of various asset sizes conduct business in very different ways. Smaller community banks are more likely to be relationship focused and rely on “soft information”, whereas large commercial banks are likely to be more transaction oriented and take the bureaucratic route for decision making (Hein, Koch and MacDonald, 2005). This bureaucratic route may add additional layers to the decision making process that may complicate the transfer of vital information from one layer to

another in the process. Another major difference between community and commercial banks is the ownership structure of the banks. Small bank stock is typically privately held and is concentrated in the hands of fewer stock holders. Therefore, external monitoring by means of independent directors may not be as crucial for small banks. On the other hand, ownership of large banks is widely dispersed and external monitoring may be required to overcome agency problems.

CHAPTER 3

INFORMATION ASYMMETRY AND CORPORATE GOVERNANCE: THE CASE OF REIT IPOS

3.1. Introduction

A commonly accepted view in the corporate finance literature is that there is a life cycle in the pattern of corporate financing, with firms more dependent on external financing early in their life cycle and less dependent on external financing as firms age (Rajan and Zingales, 1998). Young firms also are characterized by severe informational asymmetries which limit their ability to raise external capital (Stiglitz and Weiss, 1981; Diamond, 1989). Recognition of this limitation has further motivated researchers to focus their attention on identifying mechanisms that firms can adopt to diminish the effects of information asymmetries early in their life cycle. Separation between suppliers of finance and those who manage the finances is at the root of market frictions created by information asymmetry. This separation creates the need for corporate governance mechanisms that better assure suppliers of finance a return on their investment (Shlifer and Visnhy, 1997; Gillan, 2006).

Given this background, the present study seeks to identify corporate governance mechanisms that can potentially address the issue of informational asymmetries affecting firms early in their life cycle. To analyze the role of corporate governance in minimizing the problems due to information asymmetries, the study will confine the analysis to one industry, real estate. Hartzell, Kallberg and Liu (2008) argue that because of legal and tax restrictions associated with REITs, corporate governance is likely to be less important for REITs than for other corporations. Nonetheless, any evidence with regards to governance

characteristics influencing REIT valuations and performance might suggest that the effect of corporate governance should be at least as strong for other types of corporations where no such legal or tax restrictions exist. In addition, Hartzell, Kallberg and Liu (2008) argue that at the IPO stage, governance choices are made first and the IPO offer price decision is made later. In this context, the IPO stage provides a setting to analyze the role of governance mechanisms in reducing information asymmetries affecting firms early in their life cycle.

The remainder of the paper is organized as follows: Section 3.2 provides a review of the literature. Section 3.3 establishes the relationship between IPO underpricing and information asymmetry. Section 3.4 describes hypotheses and provides empirical predictions. Section 3.5 describes the data and sample characteristics. Section 3.6 presents the results. Finally, Section 3.7 discusses the contributions and conclusions of the study.

3.2. Literature Review

Diamond (1989) develops a model to examine reputation formation and the evolution over time of the incentive effects of reputation that reduces the conflicts of interest between borrowers and lenders. He examines the joint influence of adverse selection and moral hazard on the ability of reputation to eliminate the conflict of interest between borrowers and lenders. Specifically, he argues that incentive problems are most severe for borrowers with very limited track records, but these incentive problems become less severe for borrowers who manage to acquire a good reputation over time. In Diamond's (1989) model, if initially there is no adverse selection, reputation will work

immediately. However, when there is significant adverse selection, a period of reputation acquisition is required to mitigate the conflict of interest between lenders and borrowers. Consistent with the models proposed in Diamond (1989) and Diamond (1991), several studies (for example, see, Datta, Iskandar-Datta and Patel, 1999)) find that information asymmetries are indeed acute when the firms are young and are yet to establish their reputations.

The findings in the above studies attest to the fact that young firms are characterized by more acute informational asymmetries than older, more established firms. At the same time, researchers have focused their attention on identifying mechanisms that young firms adopt to reduce information asymmetries early in their life cycle.

3.2.1. Corporate Governance and Information Asymmetry

Prior research on board independence has documented that independent boards positively contribute to decision making process. For example, Weisbach (1988) finds that boards dominated by independent directors are significantly more likely than insider dominated boards to remove a CEO based on poor performance. He also shows that boards dominated by independent directors add to firm value through their CEO changes. In a similar vein, Byrd and Hickman (1992) examine the association between characteristics of board of directors of bidding firms and the shareholder wealth effects of tender offer bids. They document that less-negative returns to shareholders are associated with boards of directors in which at least half the members are independent of firm managers. This evidence, they argue is consistent with the claim that independent boards

benefit shareholders. Fama and Jensen (1983) argue that independent outside directors of a corporation have an incentive to develop reputation as experts in decision control. Independent outside directors seek to enhance their attractiveness as candidates for board appointments at other firms by maintaining a favorable reputation as active monitors. In a similar vein, Maug (1997) argues that independent directors have an incentive to acquire a good reputation, as independent monitors in order to gain more directorships in the future. He develops a model and argues that independent directors act as an institution that regulates the relationship between shareholders and managers where contracts are incomplete. One implication of Maug's (1997) model is that increased monitoring by independent directors may be instrumental in reducing problems associated with informational asymmetries associated with firms early in their life cycle.

Previous studies have shown that larger boards have a significantly negative impact on the firm value (For example, see Yermack, 1996). Similarly, Eisenberg, Sundgren and Wells (1998) document a negative and significant correlation between board size and profitability in a sample of small and midsized Finnish firms. For corporate boards, the problems of communication and coordination increase as board size increases (Jensen, 1993; Yermack, 1996; Sundgren and Wells, 1998). Lack of communication and coordination among board members may exacerbate problems due to informational asymmetries.

Another potential governance mechanism that can mitigate the problems associated with information asymmetries is board expertise. Booth and Deli (1999) find that the presence of unaffiliated commercial bankers on the board is positively related to bank borrowing and commercial bankers on the board offer bank debt market expertise.

Agarwal and Chadha (2005) find that the probability of restating earnings is lower in companies whose boards or audit committees have an independent director with financial expertise. In a similar vein, DeFond, Hann and Hu (2005) document a positive market reaction to the appointment of a financial expert on the audit committee. Prior studies (for example, see, Agarwal and Chadha, 2005; and Anderson, Mansi and Reeb, 2004) classify directors with CFA or CPA, directors who are chief financial officers (CFO), investment bankers, investment managers, bankers, financial consultants, auditors and CEOs of financial firms as financial experts. Specifically, Anderson, Mansi and Reeb (2004) focus on audit-committee director attributes. They posit that inclusion of a financial expert leads to greater rigor in financial reporting. Holding other factors constant, they find that presence of a financial expert on the audit committee of the board reduces the cost of debt by about 9.7 basis points. However, the evidence of financial experts on the board is mixed, and the frequency of audit committee is associated with lower debt costs.

3.2.2. Variations in REIT Governance Structures

Hartzell, Kallberg and Liu (2008) show that REIT shareholder friendly governance structures defined in terms of managerial incentives alignment with shareholders, have higher IPO valuations and better long term performance than their peers. For example, they find that increases in insider ownership and increases in variable compensation are associated with significant increases in Tobin's Q. They also show that operating performance is positively influenced by shareholder friendly governance structures. Specifically, they show that REITs with strong governance structures at the

IPO stage not only benefit from higher initial IPO valuations but also outperform their peers in terms of long term operating performance. In other words, governance characteristics adopted by firms at the IPO stage seem to benefit firms with improved performance in the long run.

3.2.3 IPO Underpricing and REITs

Corporate board characteristics at the time of an IPO (i.e. early in the life cycle of the firm) might provide insights with regards to potential governance mechanisms that can minimize the problems due to informational asymmetries. Certain board characteristics at the IPO stage might have a certifying effect with regards to credibly communicating the intrinsic value of the firm to outsiders. Consistent with the view that credible certification at the IPO stage might reduce problems relating to information asymmetry, Megginson and Weiss (1991) find that venture-backed IPO firms have significantly lower underpricing than do non-venture backed firms. Megginson and Weiss (1991) attribute the difference in underpricing between venture backed and non-ventured backed IPOs to the certification role of venture capitalists. In a similar vein, Chemmanur and Paeglis (2005) empirically examine the relationship between the quality and reputation of firm's management and various aspects of its IPO and post-IPO performance. They find that IPO firms with higher management quality are characterized by lower underpricing, greater institutional interest, more reputable underwriters and smaller underwriting expenses. Chemmanur and Paeglis (2005) argue that better and more reputable managers are able to convey the intrinsic value of their firms more credibly to outsiders and therefore play a certifying role. They argue that extent of

reduction in underpricing at IPO stage could be a consequence of reduction in information asymmetry.

Numerous studies have analyzed REIT IPOs. For example, Wang, Chan and Gau (1992) find that REIT IPOs suffer a price decline on the first day of trading as opposed to the price appreciation for industrial firms, which has been widely documented in the literature. Wang, Chan and Gau (1992) argue that lack of institutional investors' interest in REIT IPOs during their sample period (1971-1988) is the primary reason for their findings. Contrary to the findings in Wang, Chan and Gau (1992), Ling and Ryngaert (1997) find that REIT IPOs are, on average, underpriced and attribute their findings to greater institutional participation in REIT IPOs during their sample period (1991-1994). Hartzell, Kallberg and Liu (2008) analyze the impact of corporate governance structures on REIT IPOs. They find that REIT firms with shareholder friendly governance mechanisms defined in terms of managerial incentives alignment with shareholders benefit from higher initial IPO valuations (measured in terms of Tobin's Q). Together these studies document the evolution of REIT IPOs and show the changing nature of REIT IPOs over time.

3.3. IPO Underpricing as a Measure of Information Asymmetry

Theoretical models in the IPO literature posit that informational asymmetries play a significant role in IPO underpricing and ex ante uncertainty is directly related to the degree of underpricing (For example, see, Beatty and Ritter, 1986; Rock, 1986; Benveniste and Spindt, 1989; Grinblatt and Hwang, 1989). The empirical implication of these theoretical models is that IPO underpricing can be viewed as a premium for the ex-

ante uncertainty about the firm market value. Beatty and Ritter (1986) argue that ex ante uncertainty regarding the firm value is the main determinant of the level of underpricing. In his highly cited paper, Rock (1986) develops a model to explain the underpricing of initial public offerings. He posits that the level of underpricing is a premium offered to uninformed investors for the "winner's curse" problem. In his model, a group of investors have superior information and are better informed than all other investors. He argues that if the new shares are offered at their expected value, informed investors crowd out the market when good issues priced below or at their expected value are offered and withdraw from the market when bad issues priced above the expected value are offered. Therefore, he argues that the discount in offer price or underpricing is a consequence of this information asymmetry between informed and uninformed investors. The issuing firm offers the issue at a discount to guarantee the participation of uninformed investors.

Chemmanur (1993) presents an information-theoretic model of IPO pricing in which insiders selling stock have private information about their firm's prospects, and outsiders may engage in costly information production about the firm going public. Chemmanur (1993) argues that firms going public induce outsiders to engage in information production by underpricing the public offering. This is because the issuing firm by underpricing the offering is compensating outsiders for the cost of information production. Chemmanur (1993) argues that the firms that are relatively obscure, or those with projects that are costlier to evaluate, will have a greater extent of underpricing. In other words, the greater the degree of information asymmetry, the greater will be the degree of underpricing at the IPO stage. Evidence to this effect is documented by Muscarella and Vetsuypens (1987) and Ritter (1991) who find a significant inverse

relationship between underpricing and the availability of information about the firm as measured by the age of the firm.

More recently, in an empirical study, Wang and Ligon (2009) show that information asymmetry is important to IPO underpricing. By comparing the degree of underpricing for insurance and noninsurance firms, they show that information asymmetry is important for IPO underpricing is important for both insurance and non insurance firms. They build their analysis on previous studies that document a lower level of underpricing in regulated industries due to low levels of information asymmetry.

In view of the above theoretical models proposed by Rock (1986) and Chemmanur (1993) and the supporting empirical findings in the IPO literature validating their model predictions, the degree of REIT IPO underpricing will be used as a measure of information asymmetry in the study. Following previous studies, REIT IPO underpricing is calculated as the percent ratio of difference between the closing price on first day of trading and offer price for the REIT IPO.

3.4. Hypotheses Development

Independent directors are integral part of the corporate boards and have an incentive to acquire a good reputation, as independent monitors. Good reputation in turn might allow them to gain more directorships in the future. In other words, independent outside directors seek to enhance their attractiveness as candidates for board appointments at other firms by maintaining a favorable reputation as active monitors. In this context, increased monitoring by independent directors may be instrumental in reducing problems associated with informational asymmetries associated with firms early

in their life cycle. The stage in the life cycle is important because firms early in their life cycle are characterized by severe informational asymmetries and may require greater monitoring from independent directors. This leads to my first hypothesis.

Hypothesis 1a: Ceteris paribus, firms with greater board independence at the time of IPO experience lower underpricing than firms with lesser board independence.

Alternatively, greater board independence may be associated with problems that may arise due to lack of coordination and communication among board members, and thus firms with greater board independence at the time of IPO may experience greater underpricing than firms with lesser board independence. In this scenario, firms with greater board independence will experience greater degree of underpricing.

Hypothesis 1b: Ceteris paribus, firms with greater board independence at the time of IPO experience greater underpricing than firms with lesser board independence.

The following ordinary least squares regression model will be used to analyze the impact of board independence (independent variable) on the level of REIT IPO underpricing (dependent variable) after controlling for relevant variables.

$$IPOUnderpricing_i$$

$$= \beta_0 + \beta_1 BoardIndependence_i + \beta_2 BoardSize_i + \beta_3 FINExperts_i + \beta_4 CEOAge_i$$

$$+ \beta_5 CEODuality_i + \beta_6 CEODuality_i * CEOAge_i + \beta_7 Maryland_i + \beta_8 Act1999_i$$

$$+ \beta_9 REITage_i + \beta_{10} UnderwriterRanking_i + \beta_{11} REIType_i + \beta_{12} GrossSpread_i$$

$$+ \beta_{13} IPOProceeds_i + \beta_{14} Log(MarketCapitalization)_i$$

$$+ \beta_{15} PropertyTypeUnclassified_i + \beta_{16} PropertyTypeOffice_i$$

$$+ \beta_{17} PropertyTypeMortgage_i$$

$$+ \beta_{18} PropertyTypeRetail_i + \varepsilon_i \qquad (Model\ Main)$$

where,

the error term ε_i is assumed to be independently and normally distributed. In addition, the error term is assumed to be homoskedastic.

$IPOUnderpricing_i$= Percent ratio of difference between the closing price on first day of trading and offer price for the i^{th} REIT IPO (i.e.$\frac{Closing\ Price - Offer\ price}{Offer\ price} X100$).

$BoardSize_i$= Total number of directors on the i^{th} REIT board at IPO.

$BoardIndependence_i$= Ratio of number of outside directors to total number of directors for ith REIT board at IPO.

$FINExperts_i$=Proportion of directors who satisfy at least one of the following listed criteria: chief financial officer (CFO), investment banker, investment manager, banker, financial consultant, auditor, CEO of financial firm, has a MBA degree, is a CFA, is a CPA.

Control Variables:

$CEOAge_i$ =Age of the CEO of REIT i[th] board at the time of IPO.

$CEODuality_i$ = A dummy variable which takes on a value of '1' if Chairman of the board and the CEO of the i[th] REIT board is the same individual; otherwise takes on a value of '0'.

$Maryland_i$ = A dummy variable that will take on a value of '1' if the REIT i is incorporated in Maryland and '0' otherwise.

$ACT1999_i$ = A dummy variable that will take on a value of '0' for REIT i if the IPO is prior to 1999 and a value of '1' otherwise.

$REITAge_i$ = The natural logarithm of one plus the number of years between the year of incorporation and the time i[th] REIT goes public.

$UnderwriterRanking_i$ = The variable ranges from '0' to'9' for i[th] REIT. More prestigious underwriters are listed higher in the underwriting section of the IPO prospectus and are assigned a higher value. These values are taken from Jay Ritter's website.

$REITType_i$ = A dummy variable that will be assigned a value of '1' if i[th] REIT is an Equity REIT at IPO and '0' otherwise.

$GrossSpread_i$ = Gross Spread realized by the underwriter at IPO for i[th] REIT.

$IPOProceeds_i$ = Size of proceeds in millions of dollars from IPO for i[th] REIT .

$Log\ (MarketCapitalization_i)$ = The natural logarithm of Market Capitalization in millions of dollars for i[th] REIT.

$PropertyTypeUnclassified_i$ = A dummy variable which takes on a value of '1' if the investment focus of i[th] REIT at IPO is unclassified and '0' otherwise.

$PropertyTypeOffice_i$ = A dummy variable which takes on a value of '1' if the investment focus of i[th] REIT at IPO is office and '0' otherwise.

$PropertyTypeMortgage_i$ = A dummy variable which takes on a value of '1' if the investment focus of i[th] REIT at IPO is Mortgage and '0' otherwise.

$PropertyTypeRetail_i$ = A dummy variable which takes on a value of '1' if the investment focus of i[th] REIT at IPO is Retail and '0' otherwise.

$PropertyTypeResidential_i$ = A dummy variable which takes on a value of '1' if the investment focus of i[th] REIT at IPO is Residential and '0' otherwise. This variable is the omitted property type category in the model.

A description of the control variables and an explanation of their relationship with REIT IPO underpricing are provided at the end of hypothesis 3. The predicted sign of all the independent variables included in the model is provided in Table 3.1.

There is a negative and a significant relationship between degree of underpricing and board independence ($\beta_1 < 0$) if Hypothesis 1a holds true and a positive relationship ($\beta_1 > 0$) if Hypothesis 1b holds true.

Conventional wisdom additionally suggests that larger boards do not favorably contribute towards enhancing firm value. In fact, large boards are generally negatively associated with firm value, as problems of communication, coordination and control are exacerbated. Such inefficiencies hamper effective monitoring by the board and may well exacerbate informational asymmetries. The preceding observation leads to my second hypothesis.

Hypothesis 2: Ceteris paribus, firms with relatively large boards at the time of IPO will experience greater underpricing than firms with smaller boards.

Again, the aforementioned empirical model will be used to analyze the impact of board size (independent variable) on the degree of underpricing (dependent variable) after controlling for relevant variables. If the above hypothesis is true, there is a positive relationship between board size and the degree of underpricing ($\beta_2 > 0$).

Board expertise can positively contribute towards mitigating problems associated with informational asymmetries. Within the context of an IPO, board expertise might play a certifying role and reduce informational asymmetries in the process. Borrowing from earlier studies, directors with professional certification (CFA or CPA), chief financial officers (CFO), investment bankers, investment managers, bankers, financial consultants, auditors and CEOs of financial firms are classified as financial experts. In addition, board members with a MBA degree can offer valuable advice and can be considered as experts. The preceding discussion leads to my third hypothesis

Hypothesis 3: Ceteris paribus, greater board expertise at the time of an IPO is associated with less underpricing.

Again, the above model will be used to analyze the impact of board expertise (independent variable) on the degree of underpricing (dependent variable) after controlling for relevant variables. If the above hypothesis is true, there is a negative relation between board expertise and the level of underpricing ($\beta_3 < 0$).

3.4.1. Control Variables (for Hypotheses 1a, 1b, 2 and 3)

Following previous IPO studies (for example, Chemmanur and Paeglis, 2005), the analysis will control for firm size and firm age at the IPO stage. As a proxy for firm size, the market capitalization (MarketCaptitalization) of the REIT based on the IPO offer price is included in the analysis. REIT firm age (REITage) is defined as the natural logarithm of one plus the number of years between the year of incorporation and the time the REIT goes public. CEOAge and CEODuality are modeled to control for CEO characteristics. CEOAge is used as a proxy for CEO experience. Hartzell, Kallberg and Liu (2008) argue that the market may know more about more experienced CEOs and may better trust their judgment. In addition, older CEOs may have more human capital at risk in their reputations. Keeping other factors constant, one can expect the degree of underpricing to decrease with CEOAge. In addition, Cachine and Tomhe (2009) show that IPO underpricing is higher for firms with CEO duality. CEODuality may lead to greater CEO entrenchment and may increase degree of underpricing at the IPO stage. In addition, an interaction term between CEOAge and CEODuality is also included in the model. Although the CEODuality may increase the degree of IPO underpricing, the effect of CEODualtity for an younger CEO may be more pronounced. The study will control for underwriter quality (UnderwriterRanking) using the measures first proposed in Carter and Manester (1990) and as updated in Carter, Dark and Singh (1998) to rank underwriter quality. Number of studies (for example, Carter, Dark and Singh (1998)) show that the certification role based on the underwriter reputation or quality can decrease the degree of underpricing. The variable UnderwriterRanking will range from zero to nine, with higher values representing higher quality lead underwriter. For example, at the IPO stage,

the IPO prospectus lists all the investment banking firms that are part of the underwriting syndicate. More prestigious underwriters are listed higher in the underwriting section and receive a higher ranking on a scale of 0 to 9. These values are taken from Jay Ritter's website.[12] The GrossSpread is the compensation received by the underwriter for bringing the security to the market and greater the gross spread, holding other factors constant, the greater will be the underpricing. This is because the underwriter a demand more compensation if there is greater uncertainty about the issue. The study will also control for the amount of proceeds from the IPO (IPOproceeds). REIT property type (Unclassified, Office, Mortgage, Retail and Residential) focus is controlled by using dummy variables. This is because certain property type such as mortgages may be harder to value than others and may lead to greater degree of underpricing. Property type Residential is excluded variable in the analysis. A dummy variable Maryland will be used for the state of incorporation. For REITs, Maryland is a common home of incorporation. REITs incorporated in Maryland can make use of relatively strong anti-takeover provisions compared to REITs incorporated in other states. Strong anti-takeover provisions may exacerbate problems due to managerial entrenchment (Hartzell, Kallberg and Liu, 2008) and as a result may be underpriced more. REIT modernization act of 1999 introduced some key provisions that affect the REIT industry. For example, REIT modernization act allows a REIT to setup a taxable subsidiary with 100 percent ownership that allows REIT to provide ancillary services to its tenants and others. The REIT modernization act reduces the mandatory payment of earnings from 95 percent to 90 percent. In view of these key changes, Howe and Jain (2004) examine the passage of

[12] http://bear.warrington.ufl.edu/ritter/

the REIT modernization act of 1999 and document a significant decline in the systematic risk of REITs subsequent to the passage of the act. They document a positive effect of the REIT modernization act on the wealth of the REIT shareholders. Given these findings on REIT shareholder wealth, keeping other factors constant, one can expect a decrease in underpricing after the passage of the act. In order to account for the REIT modernization act of 1999, a dummy variable (ACT1999) will be employed which takes on a value of '0' prior to 1999 and a value of '1' otherwise during the sample period.

3.5. Data and Sample Characteristics

The dataset consists of REITs that went public between 1996 and 2007 as listed in the Securities Data Corporation (SDC) database. Additionally, sample firms are required to have CRSP data in order to compute initial day returns.

The governance variables, BoardSize, BoardIndependence, FINexperts, CEOAge, CEODuality and REITage are hand collected from Securities and Exchange Commissions' Form S-11 registration statements filed by the REITs. Data pertaining to state of incorporation, GrossSpread, IPOProceeds and offer price are collected from the SDC database. Data concerning MarketCapitalization and PropertyType focus are collected from the CRSP-Ziman database. Initial closing day prices to compute underpricing are collected from the CRSP database. Only REITs that have both IPO offer price and initial closing day prices are included in the study.

This study uses 105 REITs that went public between the years of 1996 and 2007. A list of 105 REITs along with the IPO date is provided in the Appendix. Table 3.2 presents the number of REITs that went public during each year of the sample. Table

3.3 offers summary statistics for the variables used in the study. The mean (median) underpricing is 4.77% (0.95%) for the whole sample. This number compares well with the mean underpricing of 3.65% between the period of 1990 and 1994 reported by Ling and Ryngaert (1997). The average (median) board size of REITs at IPO during the sample period is 6.7 (7.0) members. In terms of board independence on an average, 60% of the members on the board are independent. On average (median), there are 1.76 (2.00) financial experts on the board at the time of IPO. The mean (median) age of the CEO at the time of IPO is 48.15 (47.00) years. For comparison purposes, Boon, Fields, Karpoff and Rajeha (2007) analyze all industrial firms in US that went public from 1988 to 1992 and report an average board size of 6.21 directors. In terms of board independence, on an average 56% of the board members are independent. They report an average CEO age of 48 years at the time of the IPO.

Table 3.4 presents the REIT characteristics at the time of IPO. 80.95% of the sample REITs are Equity REITs. 78.10% of REITs in the sample are incorporated in the state of Maryland. 53.33% of REITs in the sample went public after the REIT modernization act of 1999. More than 55% of REITs at the IPO stage have a single individual as both the Chairman and the CEO of the board. Again to compare, Boon, Fields, Karpoff and Raheja (2007) show that 60% of their sample firms have a single individual who is both the CEO and Chairman of the board at the IPO stage. REIT classification by property type shows that Unclassified (33.33%), Office (22.86%) and Mortgage (29.52%) constitute significant proportions of the sample.

Table 3.5 reports the Pearson correlation coefficients among the key governance variables used in the study. BoardSize and BoardIndependence are positively correlated

(0.46) suggesting an increase in board independence for larger boards. This is an interesting result showing that larger boards have proportionately more independent directors. CEOduality and CEOage are positively correlated (0.34) suggesting older CEOs are more likely to be the Chairman of the board.

3.6. Regression Results

3.6.1. Multicollinearity

Multicollinearity exits when the independent variables included in the regression model are significantly correlated. Multicollinearity does not involve the dependent variable. More importantly, the existence of Multicollinearity does not violate any regression assumptions. However, multicollinearity may cause larger variances of parameter estimates. In other words, the existence of multicollinearity implies that the estimates of the parameters tend to be less precise and will tend to have insignificant tests and wide confidence intervals (Mansfield and Helms (1982)).

Variance Inflation Factors (VIFs) were computed for all the independent variables included in the main model. The VIFs for CEODuality, CEOAge*CEODuality, GrossSpread and IPOProceeds were greater than 10.00. In view of these high VIFs, alternative models were considered after excluding these variables.

3.6.2. Discussion of Results

The primary variables of interest in the study are BoardIndependence, BoardSize and FINExperts. In order to analyze the impact of BoardIndependence, BoardSize and FINExperts individually, models were run after including

BoardIndependence, BoardSize and FINExperts as separate independent variables. These models are labeled Model 1, Model 2 and Model 3 respectively. The results from Model 1, Model 2 and Model 3 are reported in Table 3.5, Table 3.6 and Table 3.7 respectively. In addition, (Model 1)[a] , (Model 2)[a] and (Model 3)[a] reported in Table 3.5, Table 3.6, and Table 3.7 respectively, only include independent variables with VIFs less than 10.00.

Model 1 in Table 3.5 reports the relationship between BoardIndependence and REIT underpricing at the IPO stage. The coefficient of BoardIndependence from Model is 0.026. The parameter estimate is not significant. The coefficient of BoardIndependence from (Model 1)[a] is also 0.026 and again insignificant suggesting BoardIndependence is not a significant determinant of underpricing at the IPO stage. This finding is contrary to the predictions made in both hypothesis 1a and hypothesis 1b. The coefficient of ACT1999 (0/1 dummy variable) is -4.036 (Model 1)[a] indicating a significant decline in underpricing after the enactment of REIT Modernization Act of 1999.[13] In one sense, this result is consistent with the findings of Howe and Jain (2004) who report a significant decline in the systematic risk of REITs subsequent to the passage of the act. Also the coefficient of Market Capitalization is positive and significant. Since information for larger firms is more readily available, information asymmetry hypothesis predicts a negative relationship between firm size and underpricing. However, Michaely and Shaw (1994) point out that keeping other factors constant, larger issues may be harder to sell and underwriter may underprice them to a larger extent. So, the findings in

[13] However, ACT1999 is no longer statistically significant when included in the Main Model with complete set of independent variables.

the study are consistent with the notion that larger issues are harder to sell and are underpriced to a greater extent.

Model 2 in Table 3.6 reports the relationship between BoardSize and REIT underpricing at the IPO stage. The coefficient of BoardSize from (Model 2)[a] is 0.8436. The parameter estimate is significant at 5% in both (Model 2) and (Model 2)[a] . This result is consistent with hypothesis 2 suggesting that the degree of underpricing is greater for large boards. In other words, increasing the board size by an additional member increases the level of underpricing by around 0.8 %, holding other factors constant. This is economically, significant when we consider that the average degree of underpricing during the sample is 4.77%. Control variables, ACT1999 and Market Capitalization have appropriate signs and are significant. These later findings are consistent with the results discussed in (Model 1)[a].

Model 3 in Table 3.7 reports the relationship between FINExperts and REIT underpricing at the IPO stage. The coefficient of FINExperts from (Model 3)[a] is 0.1496. The parameter estimate is not significant. This result is inconsistent with hypothesis 3, where a negative relationship between FINExperts and underpricing was predicted. Again, the coefficients of ACT1999 and Market Capitalization are consistent with the results discussed in (Model 1)[a] .

Table 3.8 reports the relationship between REIT underpricing at the IPO stage and BoardIndependence, BoardSize and FINExperts all included in one model along with other control variables. None of the three variables BoardIndependence, BoardSize and FINExperts have a VIF greater than 10.00 when included all at once in the model. The model where all three governance variables are included in one model has greater

adjusted R-Square when compared to models where the variables BoardIndependence, BoardSize and FINExperts are included separately.

The results reported in (Model: Main)[a] are consistent with hypothesis 2. Larger boards have a significant and positive effect on the degree of underpricing and the coefficient of BoardSize (1.072) is significant at 5% level. In other words, including an additional board member increases the level of underpricing by almost 1%, holding other factors constant. Financial expertise (FINExperts) on the board at the time of the IPO does not seem to be significantly related to degree of underpricing. Consistent with the results reported in Table 5, the level of underpricing increases for larger REITs. One important difference between the results reported in Tables 3.5, Table 3.6 and Table 3.7 from the results reported in Table 3.8 is the coefficient of ACT1999. The coefficient reported for ACT1999 in Table 3.8 is no longer significant. However, it still has the negative sign as reported in other tables.

The lack of significance it terms of board independence and financial expertise in the study may be due to the unique nature of the real estate industry. For example, REITs unlike other industries, frequently access capital markets. Accessing the capital markets frequently, subjects REITs to enhanced market scrutiny. Therefore, additional internal scrutiny by independent directors and financial experts may not play a crucial role for REITs.

3.7. Contributions and Conclusions

Prior research has consistently documented that young firms are characterized by more severe informational asymmetries than older, more established firms. At the same

time, some studies have identified mechanisms that firms can adopt early in their life cycle to overcome the problems due to informational asymmetries. Within this framework, this study tries to identify corporate governance mechanisms that can help minimize the problems of information asymmetries faced by firms early in their life cycle. Specifically, the study focuses on Real Estate Investment Trusts (REITs) at the IPO stage to empirically examine the role of corporate governance mechanisms in minimizing informational asymmetries. This is an important question when we consider that severe informational asymmetries limit the ability of firms to raise external capital early in their life cycle. In addition, the study contributes to the finance literature by systematically documenting the governance characteristics of REIT boards at the IPO stage. This is an important contribution since very little is known about REIT governance structures at the IPO stage vis a vis the information environment.

The results of the study suggest that holding other factors constant, smaller boards reduce the degree of underpricing at the IPO stage. The study also documents that larger boards have proportionately more independent directors when compared to smaller boards. The study also provides some evidence to show a decline in the level of underpricing after the enactment of REIT Modernization Act of 1999. However, the evidence is not robust to alternative specifications.

The lack of evidence it terms of board independence and financial expertise in the study may be due to the unique nature of the real estate industry. For example, REITs are subjected to frequently access capital markets because they are required to payout 90 percent of their taxable income as dividends. Accessing the capital markets frequently, subjects REITs to enhanced market scrutiny compared to other industries. In this context,

additional internal scrutiny by independent directors and financial experts may not play a crucial role for REITs.

For future research, I intend to analyze the evolution of REIT boards within the context of the evolving information environment. Such an analysis might offer long term perspective about the relationship between information environment and REIT board structures.

One potential limitation of the study is with regards to generalization of the results to other industries. This is because corporate governance mechanisms generally tend to be industry specific. Therefore, to generalize the findings of this study to other industries may not be appropriate.

CHAPTER 4

CONCLUSIONS

The underlying theme connecting both essay 1 and essay 2 is the issue pertaining to informational asymmetries and corporate governance. In this regard, in both the essays similar governance mechanisms in terms of corporate board composition were analyzed in addressing problems due to informational asymmetries. However, the focus of the essays differs in terms of stage of firm life cycle. In addition, I focus on two different industries banking and real estate where relatively little research with regards to governance mechanisms and informational asymmetries exists. The present study is an effort in this direction to bridge the gap in our understanding.

As part of my first essay, I focus on large and complex banking organizations which are generally characterized by severe informational asymmetries. This is because, as financial intermediaries, banks have access to borrower specific private information and are in a position to screen and monitor their borrowers. Banks typically treat borrower specific private information as confidential and do not publicly disseminate this information Diamond (1984). As highlighted in Morgan (2002), information asymmetry in the banking industry is based on the notion that "banks are black boxes, money goes in, and money goes out, but the risks taken in the process of intermediation are hard to observe from outside the bank." In terms of the stage in their life cycle, these are some of the well-established organizations and can be deemed as "mature" firms.

One of the major contributions of the study is that I document corporate board characteristics of large banking institutions in US over a 5 year period from 2001 to 2005. Most of the data for the analysis is "hand" collected. For example, the study shows that

the median board size of the sample banks is 13.00 members. This is less than 18, the average number of board members on the boards of large bank holding companies during the period 1986 to 1999 as reported in Adams and Mehran (2003). However, Adams and Mehran (2003) only focus on the top 35 largest banking companies in their study. In addition they also document a gradual decline in the number of members on the board during the sample period. Consistent with the findings in Adams and Mehran (2003), this study documents an increase in the board independence during the sample period.

The study considered alternative potential proxies for measuring information asymmetry in the banking industry. The Basel Committee on Banking Supervision (BCBS) emphasizes the need for effective corporate governance mechanisms for achieving and maintaining public trust and confidence in the banking system. The committee recognizes the need for effective corporate governance mechanisms for the proper functioning of the banking sector and economy as a whole. Specifically, the committee advocates that corporate governance mechanisms should provide proper incentives for the board and the management to pursue objectives that are in the interest of the bank and its shareholders. In this regard, the committee emphasizes the role of board of directors and senior management as the key to improving monitoring efficiency. Given this background, the study focused specifically on bank board composition and managerial compensation. In this context, the study documented a nonlinear relationship between measures of information asymmetry and bank board size across the banks and a nonlinear relationship between measures of information asymmetry bank board independence within the bank over the sample period. Specifically, the study documented an inverted U-shaped relationship between board size and bank stock's bid ask spread. In

a similar manner, an inverted U-shaped relationship was documented between board independence and credit ratings disagreement gap. These findings clearly attest to the influence of information environment on bank corporate board structures. In addition the study showed that the bank board size is "sticky" and does not alter frequently within a bank. However, bank board independence within a bank is much more responsive to the changing information environment. However, no association between CEO option based compensation and information environment could be established in this study.

The study documented a positive relationship between board size and outside director ownership. In addition, the study also documented a positive relationship between board independence and outside director ownership. The positive relationship between outside director ownership and bank board size and a positive relationship between outside director ownership and bank board independence is consistent with the view that when incentive alignment between insiders and shareholders is relatively weak (measured in terms of ownership stake), the need for external monitoring by means of additional board members who are also independent directors increases. These findings are especially meaningful when we consider that governance mechanisms are industry specific and relying on "one-size fits all" governance models might be misleading.

As mentioned before, this study is an attempt to bridge the gap in our understanding by analyzing the relationship between corporate governance mechanisms and information environment in the banking industry. The study offers insights regarding the corporate governance structures before the "credit crisis" of 2007-2010. The banking industry is at the heart of the recent credit crisis. The debate about "regulatory oversight" and "market discipline" has intensified in recent years. The introduction of Dodd-Frank

legislation in 2010 is a case in the point. In this context, extending the current study to "credit crisis" may offer further useful insights. One limitation of the study is that the analysis is confined to large complex banking organizations which are deemed to be economically significant. As such, these results need not necessarily be applicable for smaller community banks.

As part of my second essay, I focus on Real Estate Investment Trusts (REITs) early in their life cycle when they are "young". Conventional wisdom suggests that there is a life cycle in the pattern of corporate financing, with firms more dependent on external financing early in their life cycle. At the same time, young firms are also characterized by severe informational asymmetries which hamper their ability to raise external capital. Separation between suppliers of finance and those who manage the finances is at the root of market frictions created by information asymmetry, measured by IPO underpricing in this study. In this context, the analysis focused on governance mechanisms that can help mitigate problems due to informational asymmetries for young firms.

Another major contribution of the study is that I systematically document corporate board characteristics of Real Estate Investment Trusts at the IPO stage for a 12 year period from 1996 to 2007. This is one of the unique studies which provides a perspective about REIT governance characteristics vis-à-vis other industrial firms in US at the IPO stage. For example, the mean board size of REITs at IPO during the sample period was 6.7 members. In terms of board independence on an average, 60% of the members on the board were independent. The mean age of the CEO at the time of IPO was 48.15 years. For comparison purposes, Boon, Fields, Karpoff and Rajeha (2007) analyze all industrial firms in US that went public from 1988 to 1992 and report an

average board size of 6.21 directors. In terms of board independence, on an average 56% of the board members were independent. They report an average CEO age of 48 years at the time of the IPO.

The findings of the study indicate that smaller boards experience lesser degree of underpricing at the IPO stage holding other factors constant. The study also documented a positive relationship between board size and board independence, suggesting that larger boards on average have proportionately more independent directors. In addition, the study also provides some empirical evidence to show a decline in REIT underpricing after the enactment of REIT Modernization Act of 1999. However, the evidence is not conclusive in this regard.

There is no evidence to suggest that increased board independence and the inclusion of financial experts on the REIT board reduce the degree of underpricing at the IPO stage. This result may not be surprising when we consider the unique nature of the real estate industry. For example, REITs are subjected to frequently access capital markets because they are required to payout 90 percent of their taxable income as dividends. Accessing the capital markets frequently, subjects REITs to enhanced market scrutiny compared to other industries. In this context, additional internal scrutiny by independent directors and financial experts may not play a crucial role for REITs.

As an extension of this study for future research, I intend to examine how the degree of information asymmetry changes with time and how these changes are associated with changes in board size and board composition for REITs. In other words, it might be a fruitful exercise to track the evolution of REIT boards over time to observe the impact of information environment on governance mechanisms. One potential

limitation of the study is that results may not be generalized to other industries as corporate governance mechanisms generally tend to be industry specific.

One potential limitation of the study is the apparent disparity in the treatment of measures of information asymmetry. In my first essay, the measures of information asymmetry are considered as exogenous variables. This consideration is based on the theoretical models proposed in studies such as Raheja (2005) where governance mechanisms such as board size and board independence evolve in response to the information environment. In my second essay, REIT IPO underpricing is used as a measure of information asymmetry, and more importantly is considered as an endogenous variable. However, this apparent disparity becomes less of an issue when we recognize IPO is a unique setting for the firm. As argued by Hartzell, Kallberg and Liu (2008), at the IPO stage corporate governance choices occur first and then IPO offer price is set. In this context, IPO can be viewed as an event, where governance mechanisms have an influence on degree of information asymmetry

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Table 2.1.Predicted signs for the independent variables (Hypothesis 1)

Dependent Variable: BoardSize	
Independent Variable	Predicted Sign
RatingsGap	+
RatingsGapSquare	-
BidAskSpread	+
BidAskSpreadSquare	-
EPSforecasterrors	+
EPSforecasterrorsSquares	-
ALL/ Assets	+
ALL/ AssetsSquare	-
PLL/ Assets	+
PLL/ AssetsSquare	-
CEOage	+
CEOtenure	+
Firmage	+
Log (TotalAssets)	+
Lag(ROA)	-
OutsiderOwnership	+
InsiderOwnership	-
Log (SubsidiariesAssets)	+

Note: The table details the predicted signs for independent variables included to test Hypothesis 1. The table shows Boardsize (number of members on the board), RatingsGap is the maximum ratings gap between Standard and Poor's and Moody's rating agencies for the sample banks. BidAskspread is the quarterly average of bid-ask spread for each bank in the sample. EPSforecasterrors is the variance of analyst earnings per share forecast errors for a bank in the sample. ALL represents allowance for loan loss and PLL represents provision for loan loss for the banks in the sample. The "Square" term next to the variable represents the square of the respective variable. . CEOage and CEOtenure represent CEO's age and tenure respectively. Firmage is the age of the bank since incorporation. TotalAssets and SubsidiariesAssets represent the bank's total assets and combined assets of the bank's subsidiaries. ROA represents the return on assets; OutsiderOwnership and InsiderOwnership represent the ownership of independent and inside directors respectively.

Table 2.2.Predicted signs for the independent variables (Hypothesis 2a)

Dependent Variable: BoardIndependence	
Independent Variable	Predicted Sign
RatingsGap (Max)	+
BidAskSpread	+
EPSforecasterrors	+
ALL/ Assets	+
PLL/ Assets	+
CEOage	-
CEOtenure	-
Firmage	+
Log (TotalAssets)	+
Lag(ROA)	+/-
OutsiderOwnership	+
InsiderOwnership	-
Log (SubsidiariesAssets)	+

Note: The table details the predicted signs for independent variables included to test Hypothesis 2a. Variables The table shows BoardIndependence (number of independent members on the board),RatingsGap is the maximum ratings gap between Standard and Poor's and Moody's rating agencies for the sample banks. BidAskspread is the quarterly average of bid-ask spread for each bank in the sample. EPSforecasterrors is the variance of analyst earnings per share forecast errors for a bank in the sample. ALL represents allowance for loan loss and PLL represents provision for loan loss for the banks in the sample. CEOage and CEOtenure represent CEO's age and tenure respectively. Firmage is the age of the bank since incorporation. TotalAssets and SubsidiariesAssets represent the bank's total assets and combined assets of the bank's subsidiaries. ROA represents the return on assets; OutsiderOwnership and InsiderOwnership represent the ownership of independent and inside directors respectively.

Table 2.3.Predicted signs for the independent variables (Hypothesis 2b)

Dependent Variable: BoardIndependence	
Independent Variable	Predicted Sign
RatingsGap (Max)	+
RatingsGap (Max) Square	-
BidAskSpread	+
BidAskSpreadSquare	-
EPSforecasterrors	+
EPSforecasterrorsSquare	-
ALL/ Assets	+
ALL/ AssetsSquare	-
PLL/ Assets	+
PLL/ AssetsSquare	-
CEOage	+
CEOtenure	-
Firmage	+
Log (TotalAssets)	+
Lag(ROA)	-
OutsiderOwnership	+
InsiderOwnership	-
Log (SubsidiariesAssets)	+

Note: The table details the predicted signs for independent variables included to test Hypothesis 2b. Variables The table shows BoardIndependence (number of independent members on the board), RatingsGap is the maximum ratings gap between Standard and Poor's and Moody's rating agencies for the sample banks. BidAskspread is the quarterly average of bid-ask spread for each bank in the sample. EPSforecasterrors is the variance of analyst earnings per share forecast errors for a bank in the sample. ALL represents allowance for loan loss and PLL represents provision for loan loss for the banks in the sample. The "Square" term next to the variable represents the square of the respective variable. . CEOage and CEOtenure represent CEO's age and tenure respectively. Firmage is the age of the bank since incorporation. TotalAssets and SubsidiariesAssets represent the bank's total assets and combined assets of the bank's subsidiaries. ROA represents the return on assets; OutsiderOwnership and InsiderOwnership represent the ownership of independent and inside directors respectively.

Table 2.4.Predicted signs for the independent variables (Hypothesis 3)

Dependent Variable: CEOOptionawards	
Independent Variable	Predicted Sign
RatingsGap	+
BidAskSpread	+
EPSforecasterrors	+
ALL/ Assets	+
PLL/ Assets	+
CEOage	+
CEOtenure	+/-
Firmage	+
Log (TotalAssets)	+
Lag(ROA)	-
Log (SubsidiariesAssets)	+

Note: The table details the predicted sings for independent variables included to test Hypothesis 3. CEOOptionawards (proportion of option based compensation to total compensation), RatingsGap is the maximum ratings gap between Standard and Poor's and Moody's rating agencies for the sample banks. BidAskspread is the quarterly average of bid-ask spread for each bank in the sample. EPSforecasterrors is the variance of analyst earnings per share forecast errors for a bank in the sample. ALL represents allowance for loan loss and PLL represents provision for loan loss for the banks in the sample. CEOage and CEOtenure represent CEO's age and tenure respectively. Firmage is the age of the bank since incorporation. TotalAssets and SubsidiariesAssets represent the bank's total assets and combined assets of the bank's subsidiaries. ROA represents the return on assets; OutsiderOwnership and InsiderOwnership represent the ownership of independent and inside directors respectively.

Table 2.5A. Summary Statistics (Governance Variables)

Variable	N	Mean	Median	Minimum	Maximum	Standard Deviation	Skewness	Kurtosis
Boardsize	489	13.88	13.00	5.00	31.00	4.39	0.80	1.06
BoardIndependence	489	0.71	0.73	0.11	0.95	0.15	-0.78	0.47
$[\frac{Proportion\_independent}{1 - Proportion\_Independent_I}]$	489	3.88	2.70	0.12	19.00	3.31	1.72	2.96
$Ln[\frac{Proportion\_independent}{1 - Proportion\_Independent_I}]$	489	1.03	1.01	-2.08	2.94	0.82	-0.14	0.03
CEOOptionawards (%)	477	0.37	0.39	0.00	0.97	0.26	-0.01	-1.15

Note: This table details the summary statistics for the key governance variables used in the study. The sample consists of top 100 banks by asset size for each year from 2001 to 2005. The table shows Boardsize (number of members on the board), BoardIndependence (number of independent members on the board) and CEOOptionawards (proportion of option based compensation to total compensation). Proportion_independent is the ratio of independent board members to the total board size.

Table 2.5B. Summary Statistics (Information Asymmetry)

Variable	N	Mean	Median	Minimum	Maximum	Standard Deviation	Skewness	Kurtosis
RatingsGap (Max)	500	0.38	0.00	0.00	4.00	0.78	2.30	5.11
BidAskSpread	431	0.25	0.18	0.04	2.51	0.24	4.62	30.28
EPSforecasterrors	429	0.07	0.04	0.00	0.77	0.09	3.90	19.14
ALL/ Assets	481	0.01	0.01	0.00	0.02	0.00	0.61	1.86
PLL/ Assets	481	0.0030	0.0023	0.00	0.03	0.00	3.04	14.25

Note: This table details the summary statistics for the proxies of information asymmetry used in the study. RatingsGap (Max) is the maximum ratings gap between Standard and Poor's and Moody's rating agencies for the sample banks. BidAskspread is the quarterly average of bid-ask spread for each bank in the sample. EPSforecasterrors is the variance of analyst earnings per share forecast errors for a bank in the sample. ALL represents allowance for loan loss and PLL represents provision for loan loss for the banks in the sample.

Table 2.6. Summary Statistics (Control Variables)

Variable	N	Mean	Median	Minimum	Maximum	Standard Deviation	Skewness	Kurtosis
CEOage (in years)	489	55.48	56	32	77	6.32	-0.28	1.7
CEOtenure (in years)	489	8.95	6	0	48	8.27	1.52	3.23
Firmage (in years)	489	43.91	23	0	171	45.63	1.41	0.62
TotalAssets(in Billions$)	489	42.19	10.18	2.93	1291.73	112.52	6.55	54.73
Log (Total Assets)	489	9.59	9.23	7.98	14.07	1.22	1.13	0.84
ROA	489	0.01	0.01	-0.02	0.04	0	0.8	10.74
SubsidiariesAssets(in Billions $)	461	4.03	0.12	0	240.25	18.8	8.44	85.72
Log (Subsidiaries Assets)	461	11.08	11.67	0	19.3	4.04	-1.17	1.68
OutsiderOwnership (%)	489	3.83	1.44	0	75.71	8.44	5.76	39.9
Log(OutsiderOwnership)	477	0.22	0.42	-4.61	4.33	1.65	-0.36	0.07
InsiderOwnership (%)	488	3.68	0.71	0	91.4	9.72	5.81	42.07
Log(InsiderOwnership)	477	-0.23	-0.27	-4.61	4.52	1.77	0.24	-0.39

Note: The table details summary statistics for control variables used to test the hypothesis. CEOage and CEOtenure represent CEO's age and tenure respectively. Firmage is the age of the bank since incorporation. TotalAssets and SubsidiariesAssets represent the bank's total assets and combined assets of the bank's subsidiaries. ROA represents the return on assets; OutsiderOwnership and InsiderOwnership represent the ownership of independent and inside directors respectively

Table 2.7.Pearson Correlation Coefficients

	Ratings Gap (Max)	Bid Ask Spread	EPS forecast errors	ALL/ Assets	PLL/ Assets
RatingsGap (Max)	1.000	-0.075	0.114	0.078	0.146
BidAskSpread	-0.075	1.000	-0.017	0.088	0.012
EPSforecasterrors	0.114	-0.017	1.000	0.193	0.299
ALL/ Assets	0.078	0.088	0.193	1.000	0.567
PLL/ Assets	0.146	0.012	0.299	0.567	1.000

Note: The table showcases Pearson Correlation Coefficients among the five measures of information asymmetry namely RatingsGap (Max), BidAskSpread, EPSforecasterrors, ALL/Assets and PLL/Assets used in the study.

Table 2.8.Poisson Regression Estimates of Bank Board Size as a Function of Information Asymmetry and Control Variables

	Dependent Variable: BoardSize		
	(Model 1)	*(Model 1)*[a]	*(Model 1)*[b]
Parameter	*Estimate*	*Estimate*	*Estimate*
Constant	−0.3044	−0.1632	1.6563***
	(0.6821)	(0.8244)	(<0.0001)
RatingsGap (Max)	−0.0551	−0.0559	−0.0312
	(0.3083)	(0.2991)	(0.5753)
RatingsGap (Max) Square	−0.0018	−0.0016	−0.0020
	(0.9140)	(0.9260)	(0.9126)
BidAskSpread	0.5987***	0.6289***	0.7183***
	(0.0034)	(0.0021)	(0.0007)
BidAskSpreadSquare	−0.4917**	−0.4902**	−0.5507***
	(0.0135)	(0.0141)	(0.0072)
EPSforecasterrors	−0.1972	−0.3558	−0.6098
	(0.029)	(0.6139)	(0.3990)
EPSforecasterrorsSquares	1.6864	2.0377	2.3657
	(0.2504)	(0.1646)	(0.1127)
ALL/ Assets	26.039		
	(0.2305)		
ALL/ AssetsSquare	−650.635		
	(0.550)		
PLL/ Assets	5.1405	15.0143	12.7974
	(0.6450)	(0.1430)	(0.2045)
PLL/ AssetsSquare	−1213.14	−1514.96**	−1415.96**
	(0.1021)	(0.0263)	(0.0150)
CEOage	0.0525*	0.0543**	
	(0.0562)	(0.0479)	
CEOageSquare	−0.0004	−0.0004	
	(0.1384)	(0.1226)	
CEOtenure	0.0041	0.0016	0.0059
	(0.5031)	(0.7882)	(0.3279)
CEOtenureSquare	−0.0033	−0.0002	−0.0003
	(0.112)	(0.3885)	(0.2345)
Firmage	0.0016	0.0020	
	(0.2576)	(0.1758)	
FirmageSquare	0.000	0.000	

	(0.5468)	(0.4288)	
Log (Assets)	0.0676***	0.0611***	0.0739***
	(0.0002)	(0.0006)	(<0.0001)
Lag(ROA)	6.1644	6.2343	
	(0.5245)	(0.5206)	
Lag(ROA)Square	−216.217	−185.965	
	(0.5141)	(0.5751)	
OutsiderOwnership	0.0185***	0.0162***	0.0125***
	(<.0001)	(0.0004)	(0.0055)
OutsiderOwnershipSquare	−0.0002**	−0.0001*	−0.0001
	(0.0218)	(0.0630)	(0.1878)
InsiderOwnership	0.0028	0.0026	0.0013
	(0.5252)	(0.5566)	(0.7699)
InsiderOwnershipSquare	−0.000	−0.000	−0.000
	(0.6716)	(0.6923)	(0.8403)
Log (SubsidiariesAssets)	0.0107**	0.0125**	0.0087
	(0.0342)	(0.0125)	(0.1226)
Model Fit Statistics:			
AIC (smaller is better)	2122.05	2123.62	2149.33
BIC (smaller is better)	2220.81	2214.49	2216.49
N	384	384	384

Note: The table details the Poisson regression of BoardSize on descriptive and information asymmetric variables for a sample of 500 banks from 2001 to 2005. Variables used in the regression are detailed in tables 2.5A, 2.5B and 2.6. The "Square" term next to the variable represents the square of the respective variable. (Model 1)[a] excludes ALL/Assets and ALL/AssetsSquare from the (Model 1). In addition to ALL/Assets and ALL/AssetsSquare, (Model 1)[b] excludes CEOage, CEOageSquare, Firmage, Firmagesquare, Lag(ROA) and Lag(ROA)Square. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Table 2.9. Poisson Regression Estimates of Bank Board Size as a Function of Information Asymmetry and Control Variables with Fixed Effects

	Dependent Variable: BoardSize		
	(Model 1)	*(Model 1)*[a]	*(Model 1)*[b]
Parameter	*Estimate*	*Estimate*	*Estimate*
Constant	−2.3243	−1.2284	0.8507
	(0.7587)	(0.8674)	(0.3180)
RatingsGap (Max)	−0.0527	−0.0573	−0.0578
	(0.5296)	(0.4923)	(0.1475)
RatingsGap (Max) Square	0.0087	0.0103	0.0088
	(0.6985)	(0.6452)	(0.4122)
BidAskSpread	−0.1132	−0.1025	−0.1206
	(0.7303)	(0.7547)	(0.4433)
BidAskSpreadSquare	0.0363	0.0260	0.0231
	(0.8995)	(0.9249)	(0.8610)
EPSforecasterrors	0.5137	0.5526	0.5763
	(0.5706)	(0.5403)	(0.1730)
EPSforecasterrorsSquares	−0.7471	−0.8815	−0.9262
	(0.6718)	(0.6162)	(0.2550)
ALL/ Assets	−16.2405		
	(0.8085)		
ALL/ AssetsSquare	1390.601		
	(0.6209)		
PLL/ Assets	−2.1754	2.2000	−0.0540
	(0.9188)	(0.9094)	(0.9953)
PLL/ AssetsSquare	272.31	260.74	325.88
	(0.8501)	(0.8488)	(0.6107)
CEOage	0.1002**	0.0596*	
	(0.0464)	(0.0558)	
CEOageSquare	−0.0009**	−0.0009*	
	(0.0461)	(0.0547)	
CEOtenure	0.0001	−0.0017	−0.0072
	(0.9964)	(0.9087)	(0.2894)
CEOtenureSquare	0.0002	0.0003	0.0004
	(0.7593)	(0.6642)	(0.3176)
Firmage	0.0316	0.0065	
	(0.8413)	(0.9666)	
FirmageSquare	−0.0001	−0.0001	

	(0.5865)	(0.5588)	
Log (Assets)	0.1325	0.1469	0.1994**
	(0.4550)	(0.3914)	(0.0115)
Lag(ROA)	2.9065	1.7654	
	(0.8144)	(0.8862)	
Lag(ROA)Square	−200.154	−153.975	
	(0.6489)	(0.7248)	
OutsiderOwnership	0.0007	0.0005	0.0017
	(0.9377)	(0.9532)	(0.6944)
OutsiderOwnershipSquare	−0.000	−0.000	−0.000
	(0.9611)	(0.9818)	(0.9012)
InsiderOwnership	0.0036	0.0041	0.0065*
	(0.6667)	(0.6286)	(0.0963)
InsiderOwnershipSquare	−0.000	−0.000	−0.000
	(0.8086)	(0.7756)	(0.2674)
Log (SubsidiariesAssets)	0.0008	0.0014	0.0003
	(0.9381)	(0.8964)	(0.9594)
Model Fit Statistics:			
AIC (smaller is better)	2010.86	2007.78	2000.96
BIC (smaller is better)	2504.69	2493.71	2463.19
N	384	384	384

Note: The table details fixed effects model using the Poisson regression for Boardsize on descriptive and information asymmetric variables for a sample of 500 banks from 2001 to 2005. Variables used in the regression are detailed in tables 2.5A, 2.5B and 2.6.The "Square" term next to the variable represents the square of the respective variable. (Model 1)[a] excludes ALL/Assets and ALL/AssetsSquare from the (Model 1). In addition to ALL/Assets and ALL/AssetsSquare, (Model 1)[b] excludes CEOage, CEOageSquare, Firmage, Firmagesquare, Lag(ROA) and Lag(ROA)Square. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Table 2.10. Logistic Regression Estimates of Bank Board Independence as a Function of Information Asymmetry and Control Variables using Linear Model without the Squared Terms

	Dependent Variable: BoardIndependence		
	(Model 2a)	*(Model 2a)*[a]	*(Model 2a)*[b]
Parameter	*Estimate*	*Estimate*	*Estimate*
Constant	0.9617	4.640	−1.2233
	(0.8993)	(0.5266)	(0.6344)
RatingsGap (Max)	0.1003	0.0917	0.0874
	(0.2288)	(0.2719)	(0.2931)
BidAskSpread	0.3549	0.3663	0.4013
	(0.1531)	(0.1418)	(0.1047)
EPSforecasterrors	0.0753	0.0531	0.0106
	(0.9298)	(0.9145)	(0.9828)
ALL/ Assets	60.3946		
	(0.1000)		
PLL/ Assets	−5.5755	9.9855	10.659
	(0.8191)	(0.6545)	(0.6285)
CEOage	−0.0109	−0.0133	
	(0.4231)	(0.3285)	
CEOtenure	0.0129	0.01144	0.0059
	(0.2875)	(0.3456)	(0.5915)
Firmage	−0.1383	−0.2522	
	(0.6495)	(0.3982)	
Log (Assets)	0.2651	0.2162	0.1220
	(0.3804)	(0.4746)	(0.6771)
Lag(ROA)	−5.7931	−6.0565	
	(0.5146)	(0.4970)	
OutsiderOwnership	0.0059	0.0059	0.0054
	(0.3124)	(0.3123)	(0.3536)
InsiderOwnership	0.0022	0.0027	0.0024
	(0.6658)	(0.5916)	(0.6421)
Log (SubsidiariesAssets)	−0.0512***	−0.0487***	−0.0471**
	(0.0068)	(0.0098)	(0.0118)
Model Fit Statistics:			
F Test for No Fixed Effects			
Numerator DF	83	83	83
Denominator DF	232	233	236
F Value	7.31	7.23	7.44
Pr > F	<0.0001	<0.0001	<0.0001

N	329	329	329

Note: The table details the two-way fixed effects logistic regression model of BoardIndependence on descriptive and information asymmetric variables for a sample of 500 banks from 2001 to 2005. Variables used in the regression are detailed in tables 2.5A, 2.5B and 2.6. The "Square" term at the end of the variable represents the square of the variable. P-values are mentioned in the parenthesis. (Model 2a)[a] excludes ALL/Assets and ALL/AssetsSquare from the (Model 2a). In addition to ALL/Assets and ALL/AssetsSquare, (Model 2a)[b] excludes CEOage, CEOageSquare, Firmage, Firmagesquare, Lag(ROA) and Lag(ROA)Square. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Table 2.11.Logistic Regression Estimates of Bank Board Independence as a Function of Information Asymmetry and Control Variables using a Non-Linear Model with Squared Terms

	Dependent Variable: BoardIndependence		
	(Model 2b)	*(Model 2b)*[a]	*(Model 2b)*[b]
Parameter	*Estimate*	*Estimate*	*Estimate*
Constant	−5.7693	0.1695	−1.6523
	(0.4842)	(0.9831)	(0.5426)
RatingsGap (Max)	0.4443***	0.4043**	0.3705**
	(0.0064)	(0.0135)	(0.0235)
RatingsGap (Max) Square	−0.1147**	−0.1072**	−0.0994**
	(0.0195)	(0.0303)	(0.0434)
BidAskSpread	1.04823*	1.1191*	1.0882*
	(0.0913)	(0.0743)	(0.0834)
BidAskSpread Square	−0.6583	−0.7084	−0.6478
	(0.1864)	(0.1594)	(0.1965)
EPSforecasterrors	−0.0938	−0.6471	−0.9770
	(0.9582)	(0.7169)	(0.5790)
EPSforecasterrors Square	0.7263	1.1228	2.4705
	(0.8408)	(0.7567)	(0.4856)
ALL/ Assets	181.0159		
	(0.1993)		
ALL/ Assets Square	−3617.75		
	(0.5298)		
PLL/ Assets	−48.3806	−4.9370	6.8721
	(0.2295)	(0.8920)	(0.8473)
PLL/ Assets Square	2778.89	1449.43	193.7198
	(0.2833)	(0.5512)	(0.9344)
CEOage	0.2066**	0.1845*	
	(0.0425)	(0.0713)	
CEOageSquare	−0.0020**	−0.0018**	
	(0.0304)	(0.0490)	
CEOtenure	0.0701**	0.0546*	0.0369
	(0.0142)	(0.0526)	(0.1712)
CEOtenureSquare	−0.0027*	−0.0021	−0.0018
	(0.0539)	(0.1325)	(0.1762)
Firmage	−0.1483	−0.2856	
	(0.6227)	(0.3402)	
FirmageSquare	−0.0000	−0.0000	
	(0.8917)	(0.8411)	

Log (Assets)	0.2767	0.1859	0.1083
	(0.400)	(0.5613)	(0.7253)
Lag(ROA)	−28.2087	−33.3114	
	(0.2024)	(0.1333)	
Lag(ROA)Square	865.2644	1037.437	
	(0.2641)	(0.1808)	
OutsiderOwnership	0.0345*	0.0300	0.0329*
	(0.059)	(0.1021)	(0.0677)
OutsiderOwnershipSquare	−0.000	−0.000	−0.00045*
	(0.4198)	(0.1341)	(0.0978)
InsiderOwnership	−0.0208	−0.003	−0.0044
	(0.314)	(0.8125)	(0.7603)
InsiderOwnershipSquare	−0.000*	−0.000	0.000
	(0.077)	(0.7732)	(0.7171)
Log (SubsidiariesAssets)	−0.0473**	−0.0427**	−0.0455**
	(0.011)	(0.0228)	(0.0142)
Model Fit Statistics:			
F Test for No Fixed Effects			
Numerator DF	83	83	83
Denominator DF	221	223	229
F Value	6.49	6.40	6.84
Pr > F	<0.0001	<0.0001	<0.0001
N	329	329	329

Note: The table details the two-way fixed effects logistic regression model of BoardIndependence on descriptive and information asymmetric variables for a sample of 500 banks from 2001 to 2005. Variables used in the regression are detailed in tables 2.5A, 2.5B and 2.6. The "Square" term at the end of the variable represents the square of the variable. P-values are mentioned in the parenthesis. (Model 2b)[a] excludes ALL/Assets and ALL/AssetsSquare from the (Model 2b). In addition to ALL/Assets and ALL/AssetsSquare, (Model 2b)[b] excludes CEOage, CEOageSquare, Firmage, Firmagesquare, Lag(ROA) and Lag(ROA)Square. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

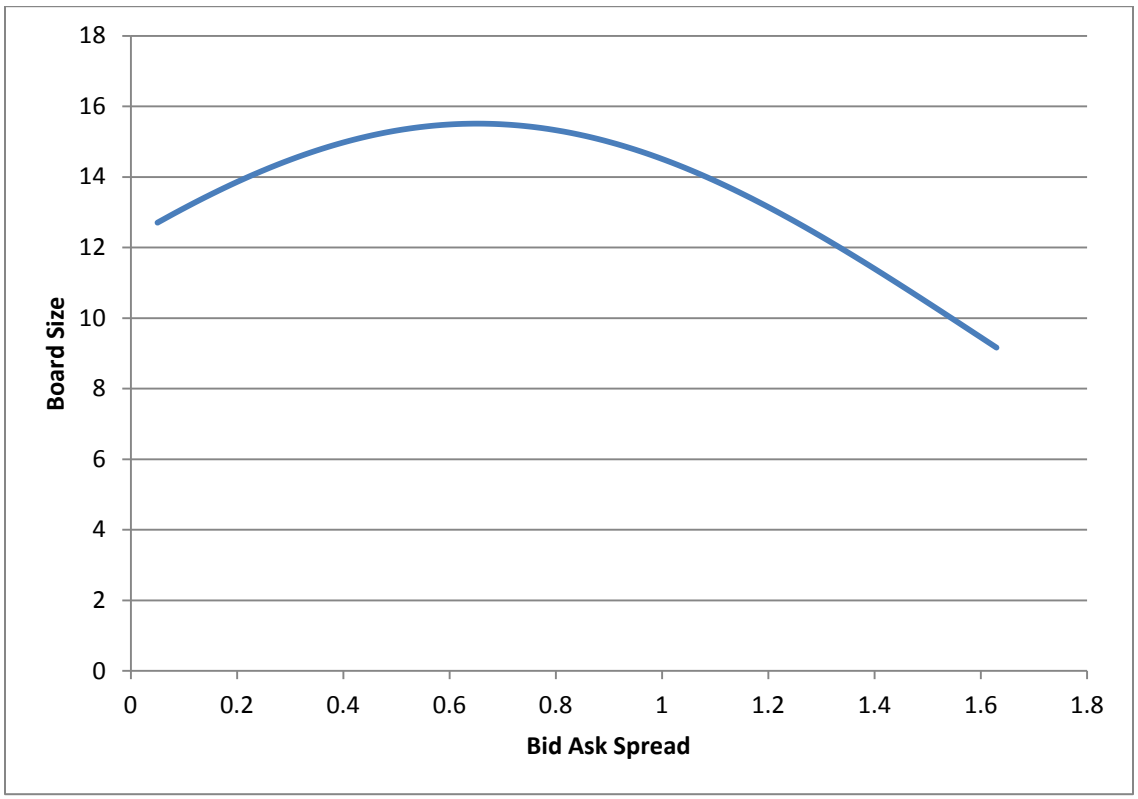
Table 2.12.Logistic Regression Estimates of CEO Option awards as a Function of Information Asymmetry and Control Variables

	Dependent Variable: CEOOptionawards		
	(Model 3)	*(Model 3)*[a]	*(Model 3)*[b]
Parameter	*Estimate*	*Estimate*	*Estimate*
Constant	−2.3558	−1.6544	−1.4308
	(0.5060)	(0.6304)	(0.6783)
RatingsGap (Max)	−0.0680	−0.0735	−0.0659
	(0.5428)	(0.5101)	(0.5559)
BidAskSpread	0.3055	0.3121	0.2534
	(0.3617)	(0.3510)	(0.4483)
EPSforecasterrors	1.0295	0.8801	0.8483
	(0.3730)	(0.4404)	(0.4587)
ALL/ Assets	40.388		
	(0.4026)		
PLL/ Assets	33.881	45.443	42.23
	(0.2969)	(0.1224)	(0.1501)
CEOage	0.0319*	0.0308*	
	(0.0813)	(0.0916)	
CEOtenure	−0.0403**	−0.0419**	−0.030**
	(0.0144)	(0.0104)	(0.0439)
Log (Assets)	0.1765	0.1342	0.2799
	(0.6629)	(0.7382)	(0.4796)
Lag(ROA)	13.106	12.860	
	(0.2765)	(0.2851)	
Log (SubsidiariesAssets)	−0.0207	−0.0188	−0.0221
	(0.4108)	(0.4523)	(0.3758)
Model Fit Statistics:			
F Test for No Fixed Effects			
Numerator DF	82	82	82
Denominator DF	234	235	237
F Value	8.76	8.80	8.93
Pr > F	<0.0001	<0.0001	<0.0001
N	327	327	327

Note: The table details the two-way fixed effects regression model of CEOOptionawards on descriptive and information asymmetric variables for a sample of 500 banks from

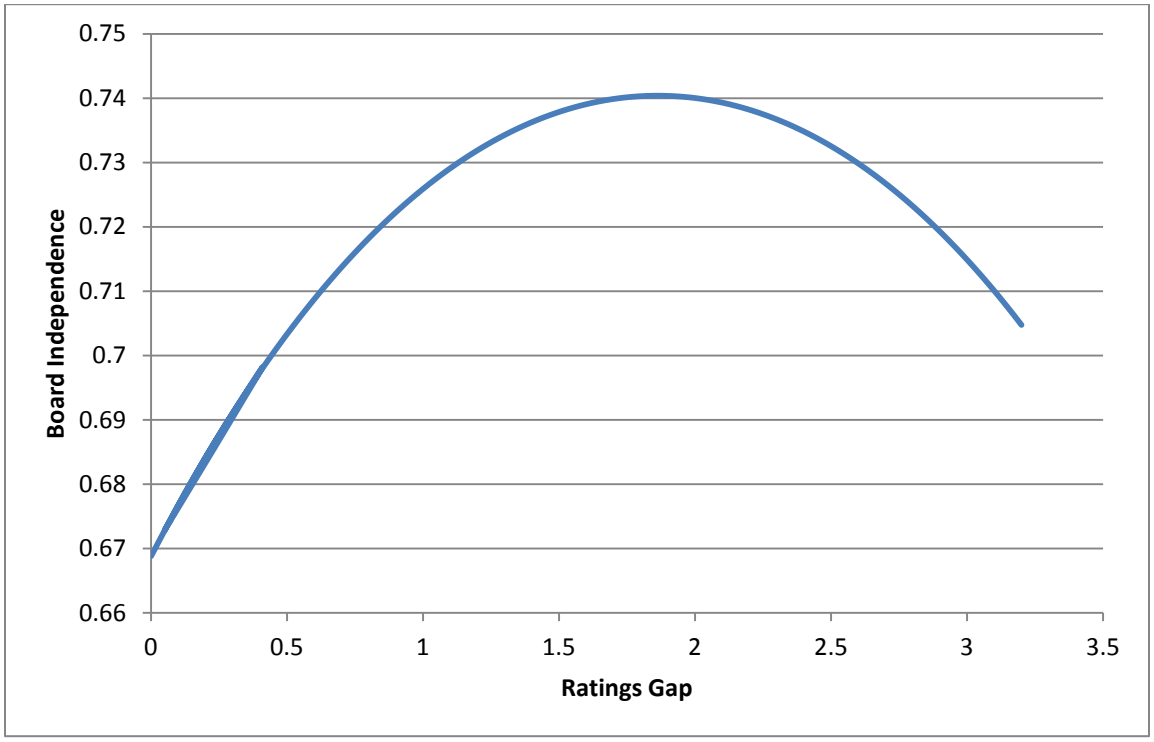
2001 to 2005. Variables used in the regression are detailed in tables 2.5A, 2.5B and 2.6. P-values are mentioned in the parenthesis. (Model 3)[a] excludes ALL/Assets and ALL/AssetsSquare from the (Model 3). In addition to ALL/Assets and ALL/AssetsSquare, (Model 3)[b] excludes CEOage, CEOageSquare, Firmage, Firmagesquare, Lag(ROA) and Lag(ROA)Square. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Figure 2.1.Board Size as a Function of Bid-Ask Spread Measure of Information Asymmetry



Note: The figure above depicts the relationship between Board Size and Information Asymmetry (Bid Ask Spread) across the banks during the sample period.

Figure 2.2. Board Independence as a Function of Ratings Gap Measure of Information Asymmetry



Note: The figure above depicts the relationship between Board Independence and Information Asymmetry (Ratings Gap) within a bank during the sample period.

Table 3.1.Predicted signs for the independent variables (Model Main)

Dependent Variable: IPO Underpricing	
Variable	Predicted signs
BoardIndependence	-
BoardSize	+
FINExperts	-
CEOAge	-
CEODuality	+
Maryland	+
Act1999	+/-
FirmAge	-
UnderwriterRanking	-
REITType (Equity=1; Mortgage=0)	+/-
GrossSpread	+
IPOProceeds	-
Log (MarketCapitalization)	-

Note: The table details the predicted sings for independent variables included to test (Model Main). IPO Underpricing is the ratio of difference between the closing price on first day of trading and offer price for the REIT IPOs in the sample. GrossSpread is the underwriters spread at the time of REIT IPO. IPOProceeds represent the total value of proceeds through IPO. MarketCapitalization represents the total market capitalization of REIT at IPO. UnderwriterRanking is the score of reputation for the lead Underwriter. FirmAge is the number of years between the year of incorporation and the time the REIT went public. BoardSize represents the total number of directors on the board. BoardIndependence is the proportion of independent directors on the board. Insiders represent the total number of non-independent members on the REIT's board. FINExperts the number of directors on RIET board who satisfy at least one of the following listed criteria: chief financial officer (CFO), investment banker, investment manager, banker, financial consultant, auditor, CEO of financial firm, has a MBA degree, is a CFA, is a CPA. CEOAge is the age of CEO in years at the time of the REIT IPO. CEODuality represents the number of REITs at time of IPO where Chairman of the board and the CEO of the board is the same individual. Maryland represents the number of REITs incorporated in the state of Maryland at the time of the IPO. REITType Equity represent the number of Equity REITs at IPO in the sample. REITType Mortgage represent the number of Mortgage or Hybrid REITs in the sample. Act1999 represents the number of REITs IPOs after the REIT Modernization Act of 1999.

Table 3.2 REIT IPOs by Year of Issuance

Year	Number of REIT IPOs
1996	6
1997	24
1998	16
1999	3
2002	3
2003	8
2004	25
2005	11
2006	5
2007	4
Total	105

Note: This table details the number of initial public offerings by year for a sample of 105 REIT IPOs from 1996 through 2007.

Table 3.3.Summary Statistics

Variable	N	Mean	Median	Minimum	Maximum	Standard Deviation	Skewness	Kurtosis
Underpricing (%)	105	4.77	0.95	-10.00	40.91	9.17	1.83	3.66
GrossSpread (%)	105	15.79	12.88	1.10	81.69	12.71	2.16	7.06
IPOProceeds (Millions of $)	104	225.37	176.25	12.00	800.00	173.95	1.52	2.32
IPOOfferPrice ($)	105	15.86	15.00	6.00	58.00	6.24	3.03	18.95
MarketCapitalization (Millions of $)	105	487.56	300.41	3.68	3974.94	618.71	3.25	12.69
Underwriter Ranking	105	7.05	8.00	0.00	9.00	2.49	-1.46	1.82
REITAge (in years)	105	9.52	1.00	0.00	98.00	19.12	3.03	9.43
BoardSize	105	6.70	7.00	2.00	18.00	2.47	1.29	5.22
BoardIndependence (%)	105	60.37	66.66	0.00	94.44	20.00	-1.67	2.83
Insiders	105	2.43	2.00	1.00	8.00	1.20	2.62	9.36
FINExperts	104	1.76	2.00	0.00	6.00	1.41	0.71	0.30
CEOAge (in years)	103	48.15	47.00	31.00	67.00	8.02	0.23	-0.59

Note: This table details the summary statistics for a sample of 105 REIT IPOs through 1996 to 2007. Underpricing is the ratio of difference between the closing price on first day of trading and offer price for the REIT IPOs in the sample. GrossSpread is the underwriters spread at the time of REIT IPO. IPOProceeds represent the total value of proceeds through IPO. IPOOfferPrice is the offer price of the issue at the time of the IPO. MarketCapitalization represents the total market capitalization of REIT at IPO. UnderwriterRanking is the score of reputation for the lead Underwriter. REITAge is the number of years between the year of incorporation and the time the REIT went public. BoardSize represents the total number of directors on the board. BoardIndependence is the proportion of independent directors on the board. Insiders represent the total number of non-independent members on the REIT's board. FINExperts the number of directors on RIET board who satisfy at least one of the following listed criteria: chief financial officer (CFO), investment banker, investment manager, banker,

financial consultant, auditor, CEO of financial firm, has a MBA degree, is a CFA, is a CPA. CEOAge is the age of CEO in years at the time of the REIT IPO.

Table 3.4.REIT Characteristics at IPO

Variable	Number of REITs	Percentage of the Sample
CEODuality	58	55.24%
Maryland	82	78.10%
EquityREITs	85	80.95%
Mortgage/HybridREITs	20	19.05%
Act1999	56	53.33%
PropertyTypeUnclassified	35	33.33%
PropertyTypeOffice	24	22.86%
PropertyTypeMortgage	31	29.52%
PropertyTypeRetail	10	9.52%
PropertyTypeResidential	5	4.76%

Note: This table represents the REIT characteristics at the time of IPO. CEODuality represents the number of REITs at time of IPO where Chairman of the board and the CEO of the board is the same individual. Maryland represents the number of REITs incorporated in the state of Maryland at the time of the IPO. EquityREITs represent the number of Equity REITs at IPO in the sample. Mortgage/Hybrid REITs represent the number of Mortgage or Hybrid REITs in the sample. Act1999 represents the number of REITs IPOs after the REIT Modernization Act of 1999. PropertyType variable Unclassified, Office Mortgage, Retail and Residential represent the number of REITs at IPO whose investment focus is Unclassified, Office, Mortgage, Retail and Residential respectively.

Table 3.5.Pearson Correlation Coefficients (Governance Variables)

	BoardSize	Board-Independence	FINExperts	CEO Age	CEO Duality
BoardSize	1.000	0.459***	0.115	0.187*	0.002
Board-Independence	0.459***	1.000	0.061	0.147	0.088
FINExperts	0.115	0.061	1.000	0.158	0.069
CEOage	0.187*	0.147	0.158	1.000	0.340***
CEODuality	0.002	0.088	0.069	0.340***	1.000

Note: The table showcases Pearson correlation coefficients among the key governance variables used in the study. Variables used in the table are defined in tables 2 and 3. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Table 3.6.REIT IPO Underpricing as a Function of Board Independence

Dependent Variable:	Underpricing	
	(Model 1)	(Model 1)[a]
BoardIndependence	0.0260	0.0260
	(0.5869)	(0.5774)
CEOAge	0.5655***	0.1899*
	(0.008)	(0.0942)
CEODuality	17.826	
	(0.149)	
CEOAge* CEODuality	−0.445*	
	(0.088)	
Maryland	−2.038	−2.9577
	(0.395)	(0.2046)
Act1999	−4.568**	−4.036**
	(0.019)	(0.0387)
REITAge	-0.4585	-0.7129
	(0.5595)	(0.3625)
UnderwriterRanking	0.064	-0.1866
	(0.8641)	(0.6138)
REITType	−2.3269	−0.9019
	(0.444)	(0.7648)
GrossSpread	0.5509	
	(0.1459)	
IPOProceeds	−0.0370	
	(0.1327)	
Log (MarketCapitalization)	3.321**	3.2280***
	(0.0106)	(0.0012)
PropertyTypeUnclassified	4.280	4.423
	(0.3889)	(0.3556)
PropertyTypeOffice	2.500	2.7452
	(0.6176)	(0.5746)
PropertyTypeMortgage	0.2478	0.0731
	(0.9594)	(0.9877)
PropertyTypeRetail	-2.1679	-2.7321
	(0.6979)	(0.6122)
Constant	−58.889***	−40.880***
	(0.001)	(0.004)
N	102	103

Adj R-Square	0.17	0.13
F-Value	2.29	2.30

Note: This table details the regression of Underpricing on descriptive and BoardIndependence variable (Model 1) for a sample of 105 REITs from 1996 to 2007. Maryland is a dummy variable which takes on a value of '1' if the REIT is incorporated in the US state of Maryland otherwise takes on a value of '0'. Act1999 is a dummy variable which takes on a value of '1' if the REIT IPO is after the REIT Modernization act of 1999, otherwise takes on a value of '0'. REITAge is (1+log (FirmAge)) for the REIT. REITType is a dummy variable which takes on a value of '1' if the REIT is an Equity REIT and '0' otherwise. PropertyTypeUnclassified, PropertyTypeOffice, PropertyTypeMortgage, PropertyTypeRetail, PropertyTypeResidential are all dummy variables which take on a value of '1' if the property types are Unclassified, Office, Mortgage, Retail and Residential respectively and '0' otherwise. PropertyTypeResidential is the dropped variable in the model. Other variables are as defined in Table 3.1, Table 3.3 and Table 3.4. N and Adj R-Square represent the number of observations and adjusted R square for the regression. F-Value is the model F value. (Model 1)[a] details the regression of Underpricing on BoardIndependence variable after excluding variables with Variance Inflation Factors (VIFs) greater than 10. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Table 3.7.REIT IPO Underpricing as a Function of Board Size

Dependent Variable:	Underpricing	
	(Model 2)	(Model 2)[a]
BoardSize	0.8571**	0.8436**
	(0.023)	(0.023)
CEOAge	0.5379***	0.1509
	(0.009)	(0.1747)
CEODuality	20.274*	
	(0.093)	
CEOAge* CEODuality	−0.490*	
	(0.055)	
Maryland	−1.678	−2.5272
	(0.465)	(0.2625)
Act1999	−3.923**	−3.4069*
	(0.035)	(0.0681)
REITAge	−0.5428	−0.8065
	(0.4778)	(0.2910)
UnderwriterRanking	−0.0091	−0.2500
	(0.9798)	(0.4865)
REITType	−2.2721	−0.9953
	(0.4350)	(0.7310)
GrossSpread	0.5250	
	(0.1539)	
IPOProceeds	−0.0322	
	(0.1780)	
Log (MarketCapitalization)	2.5467**	2.8397***
	(0.0485)	(0.0037)
PropertyTypeUnclassified	4.375	4.520
	(0.3631)	(0.3314)
PropertyTypeOffice	3.6179	3.8828
	(0.4581)	(0.4168)
PropertyTypeMortgage	0.9127	0.7874
	(0.8472)	(0.8653)
PropertyTypeRetail	−1.4541	−1.9670
	(0.7890)	(0.7082)
Constant	−53.401***	−38.808***
	(0.002)	(0.005)
N	102	103

Adj R-Square	0.21	0.17
F-Value	2.74	2.84

Note: This table details the regression of Underpricing on descriptive and BoardSize variable (Model 1) for a sample of 105 REITs from 1996 to 2007. Maryland is a dummy variable which takes on a value of '1' if the REIT is incorporated in the US state of Maryland, otherwise takes on a value of '0'. Act1999 is a dummy variable which takes on a value of '1' if the REIT IPO is after the REIT Modernization act of 1999, otherwise takes on a value of '0'. REITAge is (1+log (FirmAge)) for the REIT. REITType is a dummy variable which takes on a value of '1' if the REIT is an Equity REIT and '0' otherwise. PropertyTypeUnclassified, PropertyTypeOffice, PropertyTypeMortgage, PropertyTypeRetail are all dummy variables which take on a value of '1' if the property types are Unclassified, Office, Mortgage, Retail and Residential respectively and '0' otherwise. PropertyTypeResidential is the dropped variable in the model. Other variables are as defined in Table 3.1, Table 3.3 and Table 3.4. N and Adj R-Square represent the number of observations and adjusted R square for the regression. F-Value is the model F value. (Model 2)[a] details the regression of Underpricing on BoardSize variable after excluding variables with Variance Inflation Factors (VIFs) greater than 10. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Table 3.8.REIT IPO Underpricing as a Function of FINExperts

Dependent Variable:	Underpricing	
	(Model 3)	(Model 3)[a]
FINExperts	−0.0927	0.1496
	(0.8884)	(0.8182)
CEOAge	0.6298***	0.2063*
	(0.004)	(0.072)
CEODuality	19.158	
	(0.1208)	
CEOAge* CEODuality	−0.466*	
	(0.0741)	
Maryland	−2.084	−3.0887
	(0.3690)	(0.1822)
Act1999	−3.901**	−3.4648*
	(0.0373)	(0.0716)
REITAge	−0.3782	−0.6758
	(0.6225)	(0.3869)
UnderwriterRanking	0.0280	-0.2446
	(0.9387)	(0.5057)
REITType	−2.3077	−0.4319
	(0.4344)	(0.8857)
GrossSpread	0.8227**	
	(0.036)	
IPOProceeds	−0.060**	
	(0.020)	
Log (MarketCapitalization)	3.759***	3.0275***
	(0.002)	(0.002)
PropertyTypeUnclassified	3.226	3.639
	(0.5037)	(0.4486)
PropertyTypeOffice	2.4742	2.4171
	(0.6094)	(0.6192)
PropertyTypeMortgage	0.3840	-0.2563
	(0.9354)	(0.9571)
PropertyTypeRetail	−2.4487	−2.9446
	(0.6524)	(0.5840)
Constant	−64.899***	−37.7393***
	(0.0003)	(0.008)
N	101	102
Adj R-Square	0.19	0.11

F-Value	2.49	2.14

Note: This table details the regression of Underpricing on descriptive and FINExperts variable (Model 3) for a sample of 105 REITs from 1996 to 2007. Maryland is a dummy variable which takes on a value of '1' if the REIT is incorporated in the US state of Maryland otherwise takes on a value of '0'. Act1999 is a dummy variable which takes on a value of '1' if the REIT IPO is after the REIT Modernization act of 1999, otherwise takes on a value of '0'. REITage is (1+log(FirmAge)) for the REIT. REITType is a dummy variable which takes on a value of '1' if the REIT is an Equity REIT and '0' otherwise. PropertyTypeUnclassified, PropertyTypeOffice, PropertyTypeMortgage, PropertyTypeRetail, PropertyTypeResidential are all dummy variables which take on a value of '1' if the property types are Unclassified, Office, Mortgage, Retail and Residential respectively and '0' otherwise. PropertyTypeResidential is the dropped variable in the model. Other variables are as defined in Table 3.1, Table 3.3 and Table 3.4. N and Adj R-Square represent the number of observations and adjusted R square for the regression. F-Value is the model F value. (Model 3)[a] details the regression of Underpricing on FINExperts variable after excluding variables with Variance Inflation Factors (VIFs) greater than 10. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

Table 3.9.REIT IPO Underpricing as a Function of Governance

Dependent Variable:	Underpricing (Model: Main)	Underpricing (Model: Main)[a]
BoardIndependence	0.0040	−0.0058
	(0.9343)	(0.9117)
BoardSize	1.1041***	1.072**
	(0.0075)	(0.0118)
FINExperts	-0.2600	-0.0122
	(0.6831)	(0.9845)
CEOAge	0.6111***	0.1603
	(0.003)	(0.1532)
CEODuality	23.2865*	
	(0.0521)	
CEOAge* CEODuality	−0.5457**	
	(0.0311)	
Maryland	−1.9385	−2.8072
	(0.3938)	(0.2182)
Act1999	−3.2167*	−2.6724
	(0.0848)	(0.1663)
REITAge	−0.4719	−0.7769
	(0.5227)	(0.3056)
UnderwriterRanking	-0.0349	-0.3132
	(0.9212)	(0.3856)
REITType	−2.8330	−0.9648
	(0.3270)	(0.7447)
GrossSpread	0.8459**	
	(0.0260)	
IPOProceeds	−0.0574**	
	(0.0214)	
Log (MarketCapitalization)	2.666**	2.4536**
	(0.0337)	(0.0128)
PropertyTypeUnclassified	3.5087	3.8380
	(0.4502)	(0.4100)
PropertyTypeOffice	4.4898	4.2737
	(0.3145)	(0.3708)
PropertyTypeMortgage	1.6391	0.9129
	(0.7200)	(0.8441)
PropertyTypeRetail	−1.3842	−1.9032
	(0.7912)	(0.7155)

Constant	-59.2346^{***}	-35.456^{**}
	(0.007)	(0.011)
N	101	102
Adj R-Square	0.25	0.17
F-Value	2.92	2.51

Note: This table details the regression of Underpricing on descriptive and governance variables (Model: Main) for a sample of 105 REITs from 1996 to 2007. Maryland is a dummy variable which takes on a value of '1' if the REIT is incorporated in the US state of Maryland, otherwise takes on a value of '0'. Act1999 is a dummy variable which takes on a value of '1' if the REIT IPO is after the REIT Modernization act of 1999, otherwise takes on a value of '0'. REITage is (1+log (FirmAge)) for the REIT. REITType is a dummy variable which takes on a value of '1' if the REIT is an Equity REIT and '0' otherwise. PropertyTypeUnclassified, PropertyTypeOffice, PropertyTypeMortgage, PropertyTypeRetail, PropertyTypeResidential are all dummy variables which take on a value of '1' if the property types are Unclassified, Office, Mortgage, Retail and Residential respectively and '0' otherwise. PropertyTypeResidential is the dropped variable in the model. Other variables are as defined in Table 3.1, Table 3.3 and Table 3.4. N and Adj R-Square represent the number of observations and adjusted R square for the regression. F-Value is the model F value. (Model: Main)[a] details the regression of Underpricing on descriptive and governance variables after excluding variables with Variance Inflation Factors (VIFs) greater than 10. One, two and three asterisks denote significance at 0.10, 0.05 and 0.01 levels, respectively.

APPENDIX

List of REITs used in the study

IPO Date	Issuer (REIT)
7/25/1996	American General Hospitality
10/3/1996	Arden Realty Inc
10/14/1996	Security Capital Atlantic Inc
10/17/1996	Prentiss Properties Trust
10/29/1996	Boykin Lodging Co
11/25/1996	CB Commercial Holdings Inc
1/28/1997	Kilroy Realty Corp
2/6/1997	Golf Trust of America Inc
4/15/1997	Cornerstone Properties Inc
4/18/1997	Cornerstone Realty Income Tr
5/8/1997	Great Lakes REIT Inc
5/15/1997	Westfield America Inc
5/27/1997	Alexandria RE Equities Inc
6/17/1997	Boston Properties Inc
6/24/1997	Saxton Inc
7/7/1997	Equity Office Properties Trust
7/15/1997	CCA Prison Realty Trust
8/7/1997	Pan Pacific Ret Ppty Inc
8/14/1997	SL Green Realty Corp
9/15/1997	Hanover Capital Mortgage
9/17/1997	Security Capital Group Inc
10/8/1997	Annaly Mortgage Management Inc
10/9/1997	Tower Realty Trust Inc
10/28/1997	American Resid Invst Trust Inc
11/11/1997	Prime Group Realty Trust
11/13/1997	Captec Net Lease Realty Inc
11/18/1997	Entertainment Properties Trust
11/21/1997	AMB Property Corp
11/24/1997	Trammell Crow Co
12/3/1997	Apex Mortgage Capital Inc
1/9/1998	Resource Asset Investment
1/26/1998	ElderTrust Realty Group
1/30/1998	Cabot Industrial Trust
2/13/1998	Capital Automotive REIT
3/10/1998	United Investors Realty Trust

3/12/1998	Anworth Mortgage Asset Corp
3/24/1998	Anthracite Capital Inc
3/31/1998	Wilshire Real Estate Inv Trust
4/22/1998	Correctional Properties Trust
4/23/1998	LaSalle Hotel Properties
4/23/1998	Chastain Capital Corp
5/6/1998	Amresco Capital Trust
5/7/1998	Philips International Realty
5/13/1998	Equity One Inc
5/20/1998	ResortQuest International
5/28/1998	Clarion Commercial Hldg Inc
1/21/1999	Hersha Hospitality Trust
8/4/1999	Homestore.com Inc
10/7/1999	Homeservices Com Inc
4/23/2002	Heritage Ppty Invest Trust Inc
8/15/2002	Windrose Med Ppty Trust
10/10/2002	Newcastle Investment Corp
6/24/2003	Maguire Properties Inc
6/24/2003	American Finl Realty Trust
8/12/2003	Gladstone Commercial Corp
8/25/2003	Ashford Hospitality Trust Inc
10/23/2003	First Potomac Realty Trust
12/16/2003	Falcon Financial Investment
12/16/2003	Highland Hospitality Corp
12/18/2003	Luminent Mortgage Capital Inc
1/26/2004	Government Properties Trust
2/11/2004	Affordable Residential
3/18/2004	Capital Lease Funding Inc
4/6/2004	Arbor Realty Trust Inc
5/5/2004	Origen Financial Inc
6/9/2004	CB Richard Ellis Group Inc
6/23/2004	Strategic Hotel Capital Inc
6/24/2004	New York Mortgage Trust
7/13/2004	Homebanc Corp
7/27/2004	Gramercy Capital Corp
8/5/2004	BioMed Realty Trust Inc
8/10/2004	Kite Realty Group Trust
8/11/2004	Extra Space Storage Inc
9/16/2004	Bimini Mortgage Management
9/20/2004	Saxon REIT Inc

9/30/2004	New Century Financial Corp
10/1/2004	Eagle Hosp Prop Trust Inc
10/21/2004	U-Store-It Trust
10/25/2004	NorthStar Realty Finance Corp
10/28/2004	Digital Realty Trust Inc
10/28/2004	GMH Communities Trust
11/9/2004	ZipRealty Inc
12/15/2004	Feldman Mall Properties Inc
12/15/2004	Spirit Finance Corp
12/16/2004	MHI Hospitality Corp
1/25/2005	Education Realty Trust Inc
2/14/2005	ECC Capital Corp
5/25/2005	DiamondRock Hospitality Co
6/23/2005	KKR Financial Corp
6/28/2005	Deerfield Triarc Capital Corp
6/28/2005	Columbia Equity Trust Inc
7/7/2005	Medical Properties Trust Inc
9/19/2005	Williams Scotsman Int Inc
10/26/2005	Cogdell Spencer Inc
11/1/2005	Newkirk Realty Trust Inc
12/14/2005	Republic Property Trust
2/6/2006	Resource Capital Corp
6/6/2006	LoopNet Inc
9/27/2006	CBRE Realty Finance Inc
10/23/2006	Douglas Emmett Inc
12/12/2006	DCT Industrial Trust Inc
1/24/2007	Meruelo Maddux Properties Inc
2/14/2007	Quadra Realty Trust Inc
6/22/2007	Care Investment Trust Inc
11/15/2007	Chimera Investment Corp