Board Tenure and Firm Performance

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Abstract

I find that board tenure, measured as the average tenure of all outside board members, exhibits an inverted U-shaped relation with firm value and various corporate decisions related to a firm's M&A performance, financial reporting quality, corporate strategies and innovation, executive compensation and CEO replacement. Empirically, the highest firm value is reached at a board tenure of around nine years. For Firms with greater advisory needs or with less entrenchment costs, firm value could increase up to 12 years. The results are consistent with the interpretation that for an additional year of tenure, learning effects prevail for 'younger' boards, while entrenchment costs dominate for 'older' boards. Board tenure could change for two reasons: 1) change in board composition or 2) passage of time. The paper disentangles these two effects and shows that the inverted U-shaped relation holds even when keeping board composition constant, shading lights on how governance and performance relation evolves over time that thus far has received little attention in prior studies. To address endogeneity issues, I use a sample of sudden deaths of outside directors and find that sudden deaths that move board tenure away from (toward) the optimal are associated with a negative (positive) announcement return.

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1. Introduction

In Berles and Means (1932) corporations with separate ownership and control, boards play a crucial role in corporate governance. The board's primary function is to monitor the performance of management and provide advice on strategic issues. The board's effectiveness in these functions depends on both its independence from the management as well as its knowledge of the firm. Existing literature on the determinants of board effectiveness focuses largely on compositional differences across boards (Grinstein and Chhaochhaoria, 2007; Coles, Daniel, and Naveen, 2008; Linck, Netter, and Yang, 2008; Celikyurt, Sevilir, and Shivdasani, 2012), while little is known on how time on board affects firm performance and corporate decisions. If knowledge and independence are important determinant of board functioning, then how does knowledge and independence trade off over time? How does this tradeoff differ across firms and to what extent there exists an optimal tenure structure that maximize firm value?

The tenure of a firm's directors at the aggregate level affects both the level of the board's firm-specific knowledge as well as the extent of its independence. On the one hand, firm-specific knowledge can be accumulated as tenure increases over time and this on-job learning improves firm value (Celikyurt, Sevilir, and Shivdasani, 2012). On the other hand, increased familiarity between the board and management can undermine independence (Fracassi and Tate, 2011; Hwang and Kim, 2009). Anecdotal evidence suggests that long board tenure is negatively associated with firm performance, and that shareholders are concerned about boards with long tenure.[2] However, empirical evidence on how board tenure affects corporate decisions and firm performance is scarce.[3]

This paper starts by analyzing how board tenure, that is, the average tenure of a board's outside directors, affects corporate decisions and firm performance. Using a sample of US firms over the period 1998-2010, I find evidence of an inverted U-shaped relation between board tenure and firm value. As illustrated in Figure 1, the results are consistent with the interpretation that for an additional year of tenure, learning effects prevail for 'younger' boards, while

[2] On August 11, 2011, CNN reported that investor unhappiness about too many older directors spurred a proxy fight at Occidental Petroleum. Anne Sheehan, Director of Corporate Governance at CalSTRS and co-signer of the letter to Occidental, cites long tenures as a concern: "*If directors are on the board a long time, are they really independent and representing all shareholders? According to the latest proxy, a seven of the 11 non-executive Occidental board members have very long tenures in the double digits at 12, 14(2), 16 (2), 27 and 30 years. The issue with long tenures is that board can become less effective and less independent in their oversight"*. Similarly, the new UK corporate governance code, which went into effect in June 2011, states that "*any term beyond six years for a non-executive director should be subject to particularly rigorous review, and should take into account the need for progressive refreshing of the board*."

[3] One prior paper that studies director tenure is Vafeas (2003), who finds that a long-tenured director is less effective in monitoring management. While understanding an individual director's behavior is important, board members make decisions jointly as a group and it is not clear how individual directors' behavior aggregates in a group (Szulanski and Jensen, 2006). This study contributes to a better understanding of the trade-offs between a board's independence and knowledge related to the tenure of the board rather than the tenure of the individual board members.

entrenchment costs dominate for 'older' boards. Firm value is maximized around board tenure of 9 years. This finding is robust to controlling for an array of corporate governance characteristics (such as board size, board independence, board busyness, board interlocking, blockholders on the board, and classified board), CEO characteristics (age, tenure, ownership, and power), and firm characteristics (age, performance, complexity, growth opportunities, risk and non-time-varying characteristics) previously shown to affect firm value.

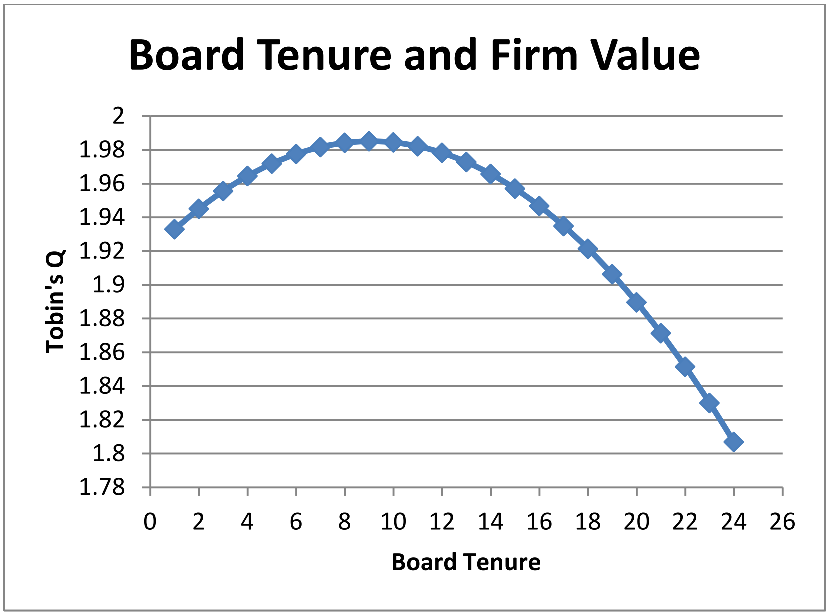

Figure 1 plots Tobin's Q against board tenure (in years). Values for Tobin's Q come from the regression reported in column 1 of Table 2.

Board tenure could change for two reasons: 1) any changes in board composition could change the average tenure (Compositional effect) or 2) holding board composition constant, the passage of time will change board tenure (Time effect). This paper disentangles these two effects by showing that even in the sub-sample where there is no change in board composition, board tenure exhibits an inverted U-shaped relation with firm value. The result suggests that independence and knowledge trade off over time, shading lights on how governance and performance relation evolves over time that thus far has received little attention in prior studies.

The above analysis relates firm value to the first moment of tenure distribution. Prior studies, in contrast, show that tenure *diversity* may have an impact on firm value. On the one hand, board diversity may enhance both learning and independence and thus have a positive impact on firm value. For instance, directors with different experience and backgrounds may approach similar problems in different ways, which tends to result in a more objective assessment. In addition, more senior directors may act as mentors to junior directors, accelerating new directors' learning curve by sharing firm-specific knowledge. On the other hand, communication and coordination difficulties may hinder knowledge diffusion within the board. The extent of knowledge transfer may be limited by a variety of factors. Von Hippel (1994) and Walton (1975), for instance, find that the nature of the knowledge being transferred can affect the extent of the transfer. Adams and Ferreira (2007) and Thakor and Whited (2011) further find that differences in incentives and disagreements about the validity of the information source matter and argues that too much board monitoring can decrease shareholder value, while Arrow (1969) and Szulanski and Jensen (2006) find that the context in which the transfer takes place matters. Empirically, Wahid (2012) uses the coefficient of variation of a director's tenure[4] as a proxy for board tenure diversity and finds that boards with more heterogeneity in director tenure exhibit higher CEO performance-turnover sensitivity and lower excess compensation. However, measuring diversity by the coefficient of variation obscures whether the performance-diversity relationship is driven by average board tenure or dispersion of tenure on the board. To take the role of diversity in account, I explore whether the effect of board tenure structure on firm value is influenced by the diversity of the board. I use the standard deviation of directors' tenure on the board as a proxy for tenure diversity and I find that tenure diversity is negatively associated with firm performance, albeit this result is marginally significant. The results suggest that on average, firms perform worse the greater is the tenure diversity of the board. I further control for other forms of board diversity, in particular, diversity in gender (Adams and Ferreira, 2009; Ahern and Dittmar, 2012), ethnicity (Westpal and Zajah, 1995), and age and the inverted U-shaped relation between board tenure and firm value remains.

To address endogeneity concerns, I examine stock market reactions to announcements of the sudden death of an independent director, which represents an unexpected exogenous shock to board tenure. If the relation between board tenure and firm value does indeed have an inverted U-shape, we would expect a positive announcement return whenever such an event moves the average board tenure towards the optimal level, and vice versa. Using a sample of 151 sudden deaths of independent directors between 1994 and 2011, I find that sudden death announcements that move board tenure away from the optimal tenure level are associated with a three-day abnormal announcement return of -1.42%, while those that move board tenure closer to the optimal tenure are associated with an announcement return of 1.04%.

To better understand the mechanisms driving the paper's main results on board tenure, in the next set of tests I re-run the main analysis on subsamples split according to the complexity of the firm's operations, the dynamism of the firm's environment, and the intangibility of the firm's assets. If knowledge is one of the underlying driving forces captured by board tenure, then firms for which the marginal value of knowledge and hence the need for advice are higher should display a maximum Tobin's Q at a longer average board tenure. Following Coles, Daniel, and Naveen (2008), I assume that firms operating in a more complex environment have greater board advisory needs and thus a longer optimal board tenure, and that the accrued benefits of

[4] The coefficient of variation of tenure is calculated as the standard deviation of directors' tenure divided by average tenure.

knowledge are longer lasting among complex firms. Similarly, because learning requires an environment that is sufficiently stable to allow a coherent body of knowledge to accumulate (Henderson, Miller, and Hambrick, 2006), the marginal value of knowledge (the optimal board tenure) is expected to be higher (longer) for firms operating in a less dynamic environment. Finally, because R&D-intensive firms have higher intangibility of assets, and hence advising these firms requires more firm-specific knowledge, optimal board tenure for more intangible firms is expected to be longer. The empirical results are consistent with each of the above hypotheses.

In a similar vein to the tests above, I explore how CEO-Board interaction affects optimal tenure choice. If familiarity between boards and CEOs undermines independent corporate governance, then the retirement or death of a CEO should break existing relations or friendliness with the board, as long as the newly appointed CEO is not equally acquainted with the board. In this case the marginal cost of entrenchment should be lower at least temporarily, suggesting that firm value should reach its maximum at a longer average tenure. Empirically, I compare firms that experience CEO deaths or retirements with those that do not. I find that firms that experience such events reach maximum firm value at an average board tenure of 12 years, while firms that do not experience such events reach peak value at an average tenure of around nine years.

The paper also rules out other alternative mechanisms that could give rise to such inverted U-shaped relation. First, board tenure may capture difference in *explicit* incentive contracting. Morck, Shielfer, and Vishnny (1988) argue that managerial equity ownership provides explicit incentive and find an inverted U-shaped relation between firm value and managerial ownership. It is possible that a short-tenured board may not be incentivized to act in the best interests of its shareholder due to a relatively low level of equity ownership. As ownership advances with tenure, the board's interests may become more aligned with shareholders' interests up to some threshold, at which point entrenchment dominates. Second, board tenure may reflect differences in *implicit* incentive contracting. Fama (1980) argues that an efficient labor market provides an implicit incentive contract to address directors' agency problems. A director that is further from retirement faces a longer career, during which time his ability can be assessed and awarded by an efficient labor market. Such a director may have stronger incentives to act in the interests of shareholders, resulting in an increase in firm value (Gibbon and Murphy, 1992). It is possible that a long-tenured board may mainly consist of directors closer to retirement and thus have weaker implicit incentives due to career concerns. By using similar measures of explicit and implicit incentive as in Morck et al (1988) and Gibbon and Murphy (1992), I find that inverted U-shaped relation between firm value and board tenure remains.

To further shed light on why board tenure and firm value have an inverted U-shaped relation, the last part of my analysis relates board tenure to various corporate decisions. If the relation between board tenure and firm value reflects a trade-off between knowledge and independence, then the same trade-off should also be reflected in corporate policies and decisions. To test this conjecture, I examine the relation between board tenure and M&A performance (Masulis, Wang, and Xie, 2007), Financial reporting quality (Biddle, Hilary, and Verdi, 2009; Dechow and Dechiv, 2002; Khan and Watts, 2009), changes in strategic direction and innovation (Finkelstein and Hambrick, 1990; Hirshleifer, Hsu and Li, 2012), option backdating (Bebchuk, Grinstein, and Peyer, 2010), and CEO performance turnover sensitivity (Weisbach 1995). The results are as follows. First, a short-tenured board tends to make better acquisition decisions as judged by the market's reaction to boards' acquisition announcements, while an acquiring firm with a long-tenured board has lower announcement returns that are more likely to be negative. Second, a short-tenured board improves financial reporting quality by providing more transparent financial statement, engaging in less earning management and exhibiting more conservatism in accounting choices. As board tenure advances, financial reporting quality declines. Third, a short-tenured board tends to be more open-minded and more willing to undertake new strategic directions, while longer-tenured board is more likely to stick with the status quo or conform to industry norms. Fourth, firms with shorter- tenured boards are less likely to award opportunistically timed option awards to their directors, while longer board tenure is associated with a higher likelihood of directors receiving a "lucky" option grant with an exercise price equal to the lowest price of the month. However, board tenure does not appear to provide incremental explanatory power for the opportunistic timing of CEO lucky grants beyond existing governance variables previously shown to explain such behavior. Fifth and finally, a short tenured board has a higher probability of replacing a non-performing CEO while the replacement decision of a long tenured board is not sensitive to bad performance.

This paper extends existing literature on corporate governance in at least four dimensions. First, this study complements a growing literature relating board characteristics to firm performance. Prior studies show that Tobin's Q is negatively correlated with a staggered board (e.g., Bebchuk and Cohen, 2005), a busy board (e.g., Fich and Shivdasani, 2006), low board independence (e.g., Grinstein and Chhaochharia, 2007), and weak shareholder rights (e.g., Gomper, Ishii, and Metrick, 2003; Cremers and Nair, 2005). The current paper contributes to this literature by showing that board tenure, a previously unexamined board characteristic, plays a significant role in firm performance and corporate decisions.

Second, this study enhances our understanding of how governance-performance relation evolves over time. Schoar and Washington (2011) show that following a period of good performance, management is more likely to introduce bad governance provisions. Philippon (2006) models variations in corporate governance over the business cycle, and finds that poorly governed firms respond more to aggregate shocks than well-governed firms. My findings add to this strand of the literature by showing that even if board composition does not change, over time the underlying benefits and costs of learning and entrenchment do change and this would affect firm decisions and performance.

Third, this paper contributes to the literature analyzing the board's dual role as advisor and monitor of management. Adams and Ferreira (2007) argue that the advisory role of the board requires close collaboration with management, while its monitoring role requires independence – roles that may conflict when the board relies solely on the CEO to access firm-specific information. The authors thus posit that shareholders emphasize one role over the other in selecting the board. Coles, Daniel, and Naveen (2008) test this idea and find that the advisory role of the board influences board size. The current paper adds to this literature by showing that board tenure may be related to the board's ability to advise as well as its willingness to monitor.

Finally, this paper contributes to the recent debate on whether to place legal limits on the tenure of board directors. While no mandatory restrictions are imposed on board tenure in the United States, Latin America, Canada, and Asia, the Financial Reporting Council in the United Kingdom does not consider a director who has been on the board nine years to be an outsider director[5], and Spain is considering a 12-year limit for independent directors.[6] Given that many proposals for governance reform explicitly stress the importance of limiting tenure on the board, this paper shows that board tenure has an inverted U-shaped relation with both firm value and corporate decisions, and that these relations vary across industries and firm characteristics, suggesting that a 'one size fits all' regulation may not be appropriate.

The paper proceeds as follows. Section 2 describes the sample. Section 3 presents the empirical results on the impact of board tenure on firm value, underlying mechanisms captured by board tenure followed by a series of tests to address endogeneity concerns. Section 4 examines the relation between board tenure and various corporate decisions. Section 5 provides additional robustness tests on the relation between firm value and board tenure. Section 6 concludes.

[5] UK Corporate Governance Code (June 2010). Publicly listed companies on the London Stock Exchange are required to state how they have complied with this code.

[6] According to a news article on January 31, 2012, Spain is considering a tenure limit of 12 years for independent directors. http://blog.issgovernance.com/gov/2012/01/spain-considers-a-12-year-tenure-limit-for-directors.html

2. Data

My analysis uses a panel of US firms drawn from the Investor Responsibility Research Center's (IRRC) database from WRDS, which covers S&P 1500 firms in the US from 1998 to 2010. I apply two filters to the IRRC data. First, each company must have starting year information of directorship (IRRC variable *dirsince*) for all board members in a given year. I supplement missing tenure information by searching original proxy filings or 10-K filings, available from Capital IQ and the online Edgar data retrieval system. Second, financial information must be available from Compustat and CEO information must be available from Execucomp. I manually match the company identifier[7] from IRRC to Compustat by company name and CEO information to ensure that the correct company has been identified.

'Board tenure' is defined as the average tenure (in number of years) of all outside directors[8] on the board and a director's tenure is calculated as the year of annual meeting (IRRC variable *meetingdate*) minus the start year of directorship (variable *dirsince*) minus any breaks in the service of directorship (indicated by variable *priorserv*[9]). The classification of directors is based on IRRC definition (variable *classification*). There are four cases in which conflicting starting year information may be recorded for the same director in the same company. 1) The same director ID is assigned to two different individuals.[10] I resolve this issue by checking the original SEC filing. 2) Directors appointed between two annual meetings are usually ratified by shareholders in the next shareholder meeting. If an appointment and the subsequent annual meeting occur in different years, conflicting starting year information may be recorded on the SEC filing (and hence in IRRC). In this case, I use the appointment year. 3) Some directors are re-appointed to the board following a break in service. IRRC may record the year of the most recent appointment. Instead, I use the year of the first appointment and adjust for breaks in service when calculating a director's tenure. 4) An inconsistent starting year may be recorded before and after a corporate transformation (incorporation, M&A, re-organization). I use the starting year of the predecessor firm.

My final sample comprises 2,158 firms with 13,989 firm-year observations. My main results are robust to excluding firm-year observations for which starting year information has

[7] IRRC uses legacy_pps_id as the company identifier in their pre-2007 director legacy file and company_id in the post-2007 director file.

[8] As noted in Grinstein and Chhaochharia (2009), IRRC use a more stringent definition of independence to classify directors than what is used under stock exchange listing rules. For example, under stock listing rules, a past employee of the company may qualify as an independent director as long as the employment relationship ends more than three years before the board appointment. However, IRRC would still treat such director as a non-independent director. Guthrie, Sokolowsky, and Wan (2011) show that re-classification the independence of director may introduce systematic bias. In this paper, I focus on tenure of non-executive directors.

[9] IRRC stopped collecting the priorserv dummy in 2003. I manually collect this variable in subsequent years by searching proxy statements for each director. For each director identified as having prior service with the board, I manually collect the period of prior service on the board.

[10] For example, on the board of Coca-Cola, director Summerfield K. Johnston III is assigned the same director id (IRRC variable: legacy_pps_id) as director Summerfield K. Johnston, Jr., the former being the son of the latter.

been adjusted as above and to excluding regulated industries (utilities and financials). See Section 5 for further details and other robustness tests.

My first set of tests involves panel data estimates relating Tobin's Q to board tenure and other corporate governance, CEO, and firm attributes[11]. More specifically, I test the following specification:

$$Tobin_{it} = \alpha_i + \alpha_t + \beta_1 * Tenure_{it} + \beta_2 * Tenure_{it}^2 + \Gamma' X_{it} + \varepsilon_{it} \qquad (1)$$

Where i indexes firms, t indexes time, α_i and α_t denote year and firm fixed effects, $Tenure_{it}$ denotes board tenure and $Tenure_{it}^2$ is the squared term of board tenure. X_{it} is a vector of controls and ϵ_{it} is the error term.

For control variables, I include variables that capture CEO and board characteristics previously shown to be related to firm value. 'Board size' is the number of directors. Yermack (1996) finds a negative relation between firm value and board size. 'Busy board' is a dummy equal to one if a majority of directors hold more than three directorships (Fich and Sivdasani, 2006). 'Blockholder on board' is a dummy equal to one if at least one director holds over 5% of the shares outstanding. 'Interlocked board' is a dummy equal to one if the board is interlocked with another company as defined by Execucomp. 'CEO age' is the age of CEOs.[12] 'CEO-chair' is a dummy equal to one if the CEO is also the chairman of the board. Hermalin and Weisbach (1998) use this measure as a proxy for the power of the CEO over the board, which has been found to affect firm value (Adams, Almeida, and Ferreira, 2005). 'CEO ownership' is a dummy equal to one if the CEO owns more than 20% of the shares outstanding. Bebchuk, Cremers, and Peyer (2011) use a similar measure and find it to be positively related to firm value (Anderson and Reeb, 2003).[13]

I also include various firm characteristics obtained from Compustat and CRSP. 'Growth opportunities' of the firm are measured by the capital expenditure to lagged asset ratio. The risk profile of a firm is captured by the standard deviation of daily stock returns over the past fiscal year. Following Coles, Daniel, and Naveen (2008), I measure firm complexity along three dimensions: firm size, number of business segments, and leverage.[14] To do so, I extract the unobserved complexity factor through factor analysis and then compute a factor score along the

[11] Following Kaplan and Zingales (1997), Tobin's Q is defined as the market value of equity plus the book value of assets minus the sum of book value of common equity and deferred taxes, all divided by the book value of assets.
[12] The oldest CEO is from Cubic Corporation, whose CEO, Walter J. Zable, is 94 years old as per the proxy filing on January 14, 2010.
[13] I also use a continuous measure of ownership and the results are similar. See Section 5 for more details.
[14] Coles, Daniel, and Naveen (2008) argue that leverage captures the complexity in a firm's financing arrangements.

three dimensions above; firms with above-median factor scores are termed ‘complex firms’.[15] Similar complexity measure is also used in Anderson, Reeb, Upadhyay, and Zhao (2012).

Table 1 presents summary statistics. Board tenure ranges between 0 and 31 years, with a mean of 8.35 and median of 7.75.[16] The average tenure of insider directors is about 10 years. The average standard deviation of tenure is 5.33 years among all outside directors on a given board. The sample correlation between board tenure and other variables are given in the last column of Table 1. Board tenure is negatively correlated with board independence and is positively correlated with CEO ownership and board interlocking. Complexity of a firm’s operation is associated with longer board tenure. Coles, Daniel, and Naveen (2008) show that firms operating in a more complex environment have greater board advisory needs and thus a longer board tenure may help board to better understand the business. Board tenure does not appear to be related to firm value at univariate level, but complex association between tenure and other variables suggests that I need to control for other sources of variation in a regression framework.

Figure 2 plots the fitted values from locally weighted regression (Lowess) of Tobin’s Q on board tenure. Lowess regression provides a non-parametric way of estimating the relation between firm value and board tenure. There is a clear hump-shaped relation firm value and board tenure, suggesting that a quadratic specification of board tenure as in Equation (1) is appropriate[17].

3. Board tenure and firm value

3.1 Baseline regression

The panel regression results of Equation (1) are reported in Panel A of Table 2. Column 1 reveals an inverted U-shaped relation between board tenure and firm value. Both coefficients are statistically significant at conventional levels and the empirically observed peak value in Tobin’s Q is around board tenure of nine years. Figure 1 above plots Tobin’s Q against board tenure with all other variables held constant. As the figure illustrates, a small change in board tenure does not have a uniform impact on firm value. For example, with all the control variables held at their respective mean, for an average board tenure of three years, an additional year of tenure will increase firm value by an average of 0.45%, while for an average board tenure of 15 years,

[15] Factor analysis reduces the dimensionality of the variables. The added benefit of using a single complexity factor score instead of the three variables individually is that it increases the power of the regression-based test by circumventing difficulties arising from multicollinearity. As expected, the complexity factor is positively related to the number of segments, firm size, and leverage.

[16] The average tenure is comparable to figures reported by Spencer and Stuart. In their 2011 Spencer and Stuart Board index, they report that average tenure of S&P 500 firms in 2011 is 8.7 years.

[17] Average tenure of 3 and 21 years corresponds to 2 and 99 percentile of the distribution. The sparsity of data points explains the smoothness of the curve. However, the underlying relation between board tenure and firm value is robust when I exclude those observations. See Section 5 for more details.

adding one year to board tenure will decrease firm value by an average of 0.52%. These results suggest that the marginal value of learning exceeds the marginal cost of entrenchment when board tenure is shorter, but that the cost of entrenchment prevails over the benefits of learning as board tenure lengthens.

The coefficients on the control variables are generally in line with those found in prior studies.[18] I obtain an inverse and statistically significant relation between board size and firm value (Yermack, 1996), while ownership by officers and directors yield positive coefficients (Yermack, 1996; Fich and Sivdasini, 2005; Anderson and Reeb, 2003). A negative albeit statistically insignificant association obtains between board busyness and firm value (Fich and Sivdasini, 2006), while significantly negative associations obtain between firm value and firm complexity (Berger and Ofek, 1995), CEO-chairman duality (Hermalin and Weisbach, 1998), firm age and interlocking boards (Fich and Sivdasini, 2006). Growth opportunities, in contrast, are significantly positively related to firm value (Kaplan and Zingales, 1997).

3.2. Diversity

The above analysis relates firm value to first moment of tenure distribution. Prior studies, in contrast, suggest that tenure *diversity* may have an impact on firm value. A priori, it is not clear how diversity in tenure may affect firm value. On the one hand, it may enhance both learning and independence and thus have a positive impact on firm value. For instance, directors with different experience and backgrounds may approach similar problems in different ways, which tends to result in a more objective assessment. In addition, more senior directors may act as mentors to junior directors, accelerating new directors' learning curve by sharing firm-specific knowledge. On the other hand, communication and coordination difficulties may hinder knowledge diffusion within a board.[19] The effectiveness of knowledge transfer may be limited by a variety of factors. Von Hippel (1994) and Walton (1975) find that the nature of the knowledge

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[18] The univariate correlation between Tobin's Q and the presence of a classified board is negative in my sample. However, the panel regression indicates that classified board is positively associated with Tobin's Q, which is inconsistent with prior findings such as Bebchuk and Cohen (2005). To investigate this inconsistency, I first replicate their Bebchuk and Cohen's regression results (Table 2 of their published paper) over the 1998 to 2002 sample period, which largely overlaps their sample period of 1995 to 2002; I find a significant negative association between Tobin's Q and the presence of a classified board. The significant negative association remains when I expand the sample period to 2010 and when I add additional governance and CEO variables that are incorporated here. However, when I add firm fixed effects, which are not included in their specification, the coefficient on classified board becomes positive and significant. Given that Bebchuk and Cohen's sample concentrates on the pre-SOX period, I further split the sample into pre-SOX and post-SOX subperiods (i.e., pre-2002 and post-2002 subperiods). I find that in the pre-SOX period classified board is significantly negatively associated with Tobin's Q, and in the post-SOX period it is significantly positively associated with firm value, even after controlling for governance variables and firm fixed effects.

[19] A stark example of how inefficiencies in information sharing within a group can affect outcomes is the 1987 space shuttle disaster. Ex post investigations have shown that the necessary information was available to the group that made the decision to launch the shuttle, but ineffective group behavior prevented sufficient sharing of the information.

being transferred affects the effectiveness of the transfer. Adams and Ferreira (2007), Szulanski (1996), Hermalin and Weisbach (1998), Marsden (1990), and Thakor and Whited (2011) find that differences in incentives and disagreements about the validity of the information source matter. And Arrow (1969) and Szulanski and Jensen (2006) find that the context in which the transfer takes place matters.

Empirical evidence on the relation between board diversity and corporate performance is mixed. Adams and Ferreira (2009) show that gender diversity is negatively related to firm performance. Anderson, Reeb, Upadhyay, and Zhao (2012) score boards based on six aspects of board heterogeneity (director's age, profession, education, experience, gender, and ethics) and find that board diversity may not necessary improve board efficacy. Wahid (2012) uses the coefficient of variation of a director's tenure[20] as a proxy for board tenure diversity and finds that boards with more heterogeneity in director tenure exhibit higher CEO performance-turnover sensitivity and lower excess compensation. However, measuring diversity by the coefficient of variation obscures whether the performance-diversity relationship is driven by average board tenure or dispersion of tenure on the board.

In this paper I use the standard deviation of directors' tenure on the board as a proxy for tenure diversity. Column 2 of Table 2 presents the results. In the sample, tenure diversity is negatively related to firm value, suggesting that potential agency cost of a diverse board more overpower the potential benefit. Column 3 of Table 2 further controls for other forms of board diversity that have been studied in prior literature, in particular, diversity in gender, ethnicity, and age. I measure diversity in gender, ethnicity, and age using the Blau Index, calculated as $1 - \sum_{i=1}^{s} p_i^2$, where s is the number of categories and p is the fraction of directors belonging to category i.[21] Gender diversity is negatively related to firm value. This finding is consistent with Ahern and Dittmar (2012) and Adams and Ferreira (2009), who find that female board representation is negatively associated with firm performance. After controlling for these additional aspects of board diversity, the inverted U-shaped relation between board tenure and firm value remains.

3.3 Compositional effect Vs Time effect

[20] The coefficient of variation of tenure is calculated as the standard deviation of directors' tenure divided by average tenure.

[21] Ethnicity is measured over five groups: Caucasian, Indian American, Asian, Hispanic, Black, and Other. Gender is measured over two groups: female and male. Age is measured in terms of birth cohorts, which are ten-year periods starting from 1910, 1920, 1930, 1940, 1950, 1960, and 1970. I also use the standard deviation of age as a proxy for age diversity; the results are similar.

Board tenure could change for two reasons: 1) any changes in board composition could change the average tenure (Compositional effect) or 2) holding board composition constant, the passage of time will change board tenure (Time effect). To understand the compositional changes over time, Figure 3(a) plots average percentage of director turnover over the sample period. I require firms to have at least two consecutive years of board information and the director turnover ratio is calculated as the percentage of directors that do not appear in next year's proxy statement. Over the sample period, the average turnover rate for outside directors is 17.5% and is 17% for all directors. There is in general a downward trend in director turnover. The turnover ratios are higher in 2001, 2003 and 2007, which correspond to the timing of two major financial crises (internet bubble in 2001 and mortgage crisis in 2007) and the regulatory reform of Sarbanes-Oxley in late 2002. The graph suggests that there is a significant variation in board composition over time. Figure 3(b) plots the percentage of firms that do not change board composition over the sample period. On average, 45% of firms keep their board composition constant from last year. For this group of firms, the average tenure will naturally increase as time passes. Studying how the tradeoff between knowledge and independence evolve over time seems especially important, because most new outside directors arrive at their firms with little direct knowledge of the company's operations and with their reputations dependent almost entirely on their current or former full-time jobs. As time passes these relations change, as directors accumulate knowledge in the firm and are more likely to influence and be rewarded for the company's strategy and performance.

Panel B of Table 2 reports the results. `Turnover Dummy' is one if a firm has changed board composition. The results show that there is an inverted U-shaped relation between firm value and board tenure even when holding board composition constant. For this group of firms, even if they had optimally chosen the tenure structure to start with, the passage of time would make them deviate from the optimal level of tenure. As long as there are some adjustment costs that prevent firms from dynamically optimizing their tenure structures by changing board composition, finding the same inverted U-shaped relation will to some extent alleviate the endogeneity concern[22]. The result suggests that independence and knowledge tradeoff over time, highlighting the importance of understanding how the relation between governance and firm performance evolve over that thus far has received little attention in prior studies.

Figure 4 plots Tobin's Q as a function of board tenure and board tenure squared using the estimated coefficients from various specifications under Table 2 while holding all the control variables at their respective mean. The empirically observed value-maximizing board tenure varies around nine years (between 8.77 to 9.63 years), depending on the various specifications. However, in all cases an inverted U-shaped relationship between board tenure and firm value remains, consistent with the notion that for an additional year of tenure, learning effects prevail for 'younger' boards while entrenchment costs dominate for 'older' boards.

[22] See next section for more discussion on endogeneity

3.5. Endogeneity

Endogeneity is a concern for the baseline regression. It is possible that poorly performing firms have trouble attracting new directors, with existing board members staying longer than optimal. To address this, I study stock market reactions to announcements of the sudden death of an outside director. As such events represent unexpected exogenous shocks to board tenure, the resulting announcement returns should differ depending on where the board is positioned on the inverted U curve. The time sequence of death and subsequent market response provide a clean test of the direction of causality.

I hypothesize that if the sudden death of an outside director moves board tenure away from the empirically observed peak value, this will result in a negative announcement return, while those deaths that move board tenure closer to the peak will be welcomed by the market. I choose board tenure of nine years as the cutoff value. Although this may appear somewhat arbitrary, Figure 4 suggests that empirically observed peak values are around nine years. In addition, the mean and median board tenure are close to nine in both the full sample and the 'sudden death' sample, resulting in a roughly even sample split.

The sample of sudden deaths is compiled from various sources. I manually searched Factiva, Edgar 8-K filings, and Google by keywords on director (e.g., "director", "board") and death ("passed away", "deceased", etc.) over the period 1994 to 2011.[23] I then read news articles and online filings to determine the cause of death. This process resulted in the identification of 948 death events, of which 638 were associated with outside directors. Further examination of the cause of death revealed that 151 deaths of outside directors were 'sudden deaths', where I define sudden deaths following Nguyen and Nielsen (2011), after excluding concurrent confounding events such as merger and acquisition announcements and quarterly earnings announcements.

Panel A of Table 3 tabulates the different causes of sudden deaths in my sample. Those deaths for which the specific cause is not disclosed but the death is described as 'unanticipated' account for the largest proportion of my sample at 36%. Apart from this, the most common causes are heart attack (30% of the sample), followed by acute illness such as pneumonia (12%),[24] stroke (7%), and accidents (8%).

[23] Part of the death sample was kindly provided by Hannes Wagner and Gilles Hilary.

[24] Arguably, acute illness such as pneumonia may develop over a short period of time, in which case the resulting death may to some extent be expected. However, independent board members meet on average four to five times a year and the onset of acute health conditions may not be immediately discovered by the firm or the media. As a consequence, such deaths may still come as a surprise to the market. Another concern is that suicide may be endogenous to firm conditions. I re-run the tests excluding both categories of deaths and the results continue to hold.

Table 3, Panel B reports results on the announcement return depending on the direction of movement of board tenure. Following the death of a death, I re-calculate the board tenure and 'Move away from the optimal' is a dummy variable equal to one if the sudden death of a director results in board tenure moving away from nine years. I calculate the cumulative abnormal return over days [-1,1] using a market model with an value-weighted market index. The choice of a three-day event window is based on two observations. First, as noted by Johnson, Magee, Nagarajan, and Newman (1985), death announcements in local and regional newspapers are likely to preclude announcements in national newspapers. Thus, the share price reaction might occur before the news date obtained from Factiva or LexisNexis. Second, Nguyen and Nielsen (2011) show that deaths are reported with an average time lag of 1.7 trading days after the actual date of death. Using a slightly wider event window allows me to capture variations in the way news is released into the market. A similar event window is also used by Nguyen and Nielsen (2011). The t-test in Panel B shows that those sudden deaths that move board tenure towards nine years attract a mean (median) abnormal announcement return of 1.038% (0.442%), while those that move board tenure away from nine years observe a negative mean (median) abnormal announcement return of 1.429% (0.926%). The difference is statistically significant at the 1% level.

Panel C reports announcement returns conditional on having a board tenure that is below nine years prior to the death of a director. When the sudden death happens, board tenure could move in three ways: First, board tenure increases but remains below the optimal. This happens when the tenure of the dead director is below average tenure of the board and I find that the 3-day announcement return is 1.079% and is significant at 5% level. Second, board tenure could increase and exceed nine years following the death of a director. I find that the announcement return is highly negative, though the sample size is very small. Third, board tenure could decrease and move further away from the nine years. This happens when the tenure of dead director is above average tenure of the board[25]. I find that the average announcement return is -0.941% and is significant at 10% level. Panel D reports announcement returns conditional on having a board tenure that is above nine years prior to the death of a director. I find that those sudden deaths that move board tenure towards nine years attract a mean abnormal announcement return of 1.25%, while those that move board tenure away from nine years observe a negative mean abnormal announcement return of 1.58%.

The analysis under Panel B to Panel D relies on the assumption that announcement returns do not reflect the expectation of whether the replacement will occur, when it will occur or who will be the replacement. Given the sudden nature of the death and the relative short event window I am focusing on, the assumption is likely to be valid. However, one might be concerned that the differences in announcement returns documented above are driven by market expectations of future changes to the board tenure following the death of a director and whether

[25] It is also possible that a director of average tenure died and hence there is no change in board tenure before and after the death, but I do not have such cases in my sample.

board tenure moves closer or away from the optimal will rely on this assumption. For example, consider a director with tenure of 3 years died on a board with average board tenure of 6 years. Assuming announcement returns do not reflect future replacement, the immediate impact is that board tenure after death could increase to 8 years and this is an event that moves the board tenure towards the optimal. If we assume announcement returns reflect future replacement and by default, the new incoming director will have a tenure of zero, the expected board tenure following the death could be 4 years and this is an event that moves board tenure away from the optimal. To what extent the announcement returns reflect expected change to the board is an empirical question. To address this issue, Panel E explores a subsample of deaths where the direction of change in board tenure is unambiguous regardless of replacement expectation. For example, a director of tenure of 8 years died on a board with average tenure of 5 years. This will always move the average board tenure away from the optimal regardless of the replacement decisions. Similarly, a director with average tenure of 17 years died on a board with average board tenure of 15 years will in general move board tenure closer to the optimal with or without replacement. The results show that those sudden deaths that move board tenure towards nine years attract a mean abnormal announcement return of 1.515%, while those that move board tenure away from nine years observe a negative mean abnormal announcement return of 1.473%. In short, the results are consistent with the baseline regression and suggest that there is an upward-sloping relation between board tenure and firm value up to the empirically observed peak value (nine years), after which point the relationship reverses. This evidence also provides further support for the conclusion that endogeneity is of a less concern and changes in board tenure lead to changes in firm value in a quadratic fashion.

Another concern with the analysis above is that market reactions may reflect reactions to characteristics of the deceased director rather than reactions to characteristics of the board. Table 4 employs a regression framework to further control for other director, board, and firm characteristics that may potentially explain the announcement returns. For board characteristics, I control for board size, independence of the board, and CEO-Chairman duality. For characteristics of the deceased directors, I control for director tenure, director age, and committee memberships. For firm characteristics, I control for the size of the firm, the market-to-book ratio, and firm age. I further control for industry effects using Fama-French 10 industry dummies and I include year dummies to control for time trends. To account for possible multiple directorships, I cluster standard errors at the director level. Board tenure remains significant after controlling for all the above variables. Deaths that move the board tenure away from the optimal attract a significantly negative coefficient at the 1% level. Column 2 reports the analysis on a subsample where replacement or non-replacement does not affect the direction of change in board tenure and I find similar results as to those in the full sample. To conclude, both event study regression analysis and univariate t-tests are consistent with the baseline regression, and run counter to an interpretation of reverse causality. Additional robustness tests are provided in Section 5 below.

3.6. Underlying mechanisms

3.6.1. Knowledge

If knowledge is one of the underlying driving forces captured by board tenure, then firms for which the marginal value of knowledge and the need for advice are higher should display a maximum Tobin's Q at a longer average tenure. Following Coles, Daniel, and Naveen (2008), I assume that firms operating in a more complex environment or firms with more intangible assets have greater board advisory needs, and that the accrued benefits of knowledge are longer lasting among complex firms. For those firms, board members require more time to acquire the knowledge needed to advise on the appropriate strategy. The same knowledge used to advise management is also relevant for monitoring, as it allows the board to identify a weakness and consider the firm's exposure to risk in the context of its operating environment. To proxy for intangibility of assets, I use R&D intensity. To proxy for complexity, I follow a similar approach as Coles, Daniel, and Naveen (2008).

Knowledge acquisition also requires a stable environment so that it can accumulate into a coherent body rather than being rendered obsolete by external changes (Henderson, Miller, and Hambrick, 2006). In a relatively stable environment, a board can anticipate the future because past and future conditions are strongly correlated, and thus the board can provide sound advice on the direction best suited to the external environment in the near future. Further, in a stable environment any changes are likely to remain relevant for a period of time. In a dynamic environment, in contrast, the potential for improvement is more limited as knowledge of the firm's operating conditions and strategies designed to respond to conditions are quickly rendered obsolete.

Table 5 Panel A presents the panel regression results. The first three columns split the sample between complex and non-complex firms. For complex firms, maximum firm value is reached at an average board tenure of 11.3 years. This result is consistent with my expectation that for complex firms, the accrued benefits from learning are longer lasting and thus the onset of the value-declining phrase is delayed. For non-complex firms, imposing a quadratic relation between board tenure and firm value yields no significant relation. Though I posit a brief period of performance improvement for non-complex firms, it is possible that the benefits from learning are offset so quickly that these firms should simply focus on the board's effective independence to obtain the most objective monitoring and advice. Column 3 of the table explores this possibility and finds that performance declines immediately and steadily over the course of a board's tenure. While it is possible that a board is associated with improved firm performance within the first year of its tenure (before the decline sets in), the annual data preclude detection of such a possibility. Taken as a whole, the results for non-complex firms fail to support the predicted inverted U-shaped relation, but rather show a monotonic declining relation between firm value and board tenure. For these firms, boards are at their best at the outset of their tenure, with their impact steadily declining as their tenure lengthens.

Columns 4-6 of Table 5 present results for R&D intensity sample splits. Consistent with the prediction that more R&D-intensive firms benefit more from knowledge acquisition, I find that board tenure exhibits an inverted U-shaped relation with firm value only for R&D-intensive firms. Maximum firm value is at an average tenure of 10.2 years, while the relation monotonically decreases for non-R&D intensive firms.

Columns 7-9 of Table 5 compare the relation between dynamic industries and non-dynamic industries. 'Dynamic' industries include internet stocks, as in Ritter and Loughran (2004), or firms in the technology sector. For non-dynamic industries, I find an inverted U-shaped relation between firm value and board tenure, with firm value peaking at an average tenure of 8.8 years. For dynamic industries, I find that the relation between firm value and board tenure decreases monotonically. These findings support the notion that performance improvements are contingent on the dynamism of the external environment. An immediate and steady decline in performance is consistent with knowledge quickly becoming obsolete in dynamic industries, just as the costs of entrenchment swiftly prevail over the benefits of board learning.

The above results suggest that knowledge impacts the relation between board tenure and firm value. For firms that operate in less complex, less R&D-intensive, and more dynamic environments, the marginal benefits of learning are sufficiently small that shareholders should focus on the monitoring role of the board.

3.6.2. CEO-Board Interaction

In a similar vein to the tests above, I explore how CEO-Board interaction affects optimal tenure choice. Prior studies show that familiarity between CEOs and directors exacerbates shareholder management agency problems. Hwang and Kim (2009) find that boards are less willing to replace non-performing CEOs and are more likely to award CEOs excessive compensation when directors are socially related to CEOs. Fracassi and Tate (2011) show that CEO-director relations reduce firm value, particularly in the absence of other governance mechanisms. If familiarity between boards and CEOs undermines independent corporate governance, then the retirement or death of a CEO should break existing relations with the board, as long as the newly appointed CEO is not equally acquainted with the board. In this case the marginal cost of entrenchment should be lower at least temporarily, suggesting that Tobin's Q should reach its maximum at a longer average tenure. Empirically, I compare firms that experience CEO deaths or retirements with those that do not. During my sample period, I identify 90 firms that experience CEO deaths and 676 firms that experience CEO retirements. Panel B of Table 5 reports the results. I find that firms that experience a CEO retirement or death reach maximum firm value at an average board tenure of 12 years, while firms that do not experience such events reach peak value at an average tenure of around nine years.

Before turning to analysis of alternative mechanisms, it is important to address limitations of the subsample analysis above. I measure the impact of entrenchment using within-firm changes in the degree of friendliness due to the departure of a CEO. The identification assumption is that such departures—unlike forced CEO turnover—are not driven by firm performance itself. Though there might be some anticipation of a CEO's death in certain cases, it is important to note that 1) deceased CEOs manage the company during the year of their death and 2) the results imply that deaths predict variation in CEO-board friendliness and in turn entrenchment costs. In contrast, CEO retirements are easier to predict, but the results imply that newly appointed CEOs are not equally acquainted with boards and hence there is at least a temporary reduction in board-CEO friendliness.

3.7 Alternative mechanisms

The above two sections argue that knowledge and entrenchment are underlying mechanisms that are captured by board tenure. In this section, I rule out two alternative mechanisms that could give rise to the inverted U-shaped relation between firm value and board tenure.

3.7.1 Explicit incentives

Morck, Shielfer, and Vishnny (1988) examine the relation between firm value and managerial ownership and find that firm value first increases and then decreases with managerial ownership. They suggest that the increasing relation between ownership and firm value reflects an alignment of interests between shareholders and management, while the decreasing relation reflects entrenchment of the management team. It is possible that a short-tenured board may not be incentivized to act in the best interests of its shareholder due to a relatively low level of equity ownership. As ownership advances with tenure on the board, the board's interests may become more aligned with shareholders' interests up to some threshold, at which point entrenchment dominates.

Though I have include a CEO ownership dummy in the baseline regression, to exclude the possibility that the inverted U-shaped relation between board tenure and firm value is driven by changes in equity ownership, I further control for outside director ownership, CEO ownership, and their squares in the regression. Column 1 of Table 6 reports the results. Consistent with prior studies, I find an inverted U-shaped relation between CEO equity ownership and firm value, while total director ownership does not appear to have an impact. Even after controlling for the nonlinear relation in management ownership, I still find an inverted U-shaped relation between firm value and board tenure.

3.7.2 Implicit incentives

Fama (1980) argues that an efficient labor market provides ex-post settling up for executives' past decisions that are consistent with shareholder interests. In other words, an efficient labor market provides an implicit incentive contract to address directors' agency problems. Gibbon and Murphy (1992) argue that directors with different career horizons may exhibit different behaviors. A director that is further from retirement faces a longer career, during which time his ability can be assessed and awarded by an efficient labor market. Such a director may have stronger incentives to act in the interests of shareholders, resulting in an increase in firm value. A long-tenured board may consist of directors closer to retirement and thus have weak incentives due to career concerns, which may result in a misalignment of interests between directors and shareholders. A short-tenured board, however, may consist of younger directors whose career prospects have yet to be assessed and awarded by the market for directors and thus may have stronger incentives to increase firm value. It is therefore possible that, rather than reflecting the trade-off between knowledge and entrenchment, board tenure reflects differences in implicit incentives.

There is no consensus on the retirement age of directors, nor is there a mandatory requirement to impose an age limit on director retirement. However, Spencer Stuart's recent survey[26] shows that 74% of all S&P 500 firms have a mandatory retirement age and more than 60% of boards set the retirement age at 70. Yermack (2004) finds that directors over age 70 retire at a significantly higher rate than other directors. Similar to Gibbon and Murphy (1992), I use the proportion of directors that are above the retirement age of 70 as a proxy for career concerns. I also control for the average age of outside directors.[27]

Column 2 of Table 6 reports the results. The average age of outside directors (60 years) has a correlation with average board tenure of 45%. This suggests that there is still significant variation in board tenure is not related to age or career horizons. Consistent with expectations, both the proportion of retirement age directors and the average age of outside directors are negatively correlated with firm value, consistent with Gibbon and Murphy (1992)'s finding that implicit incentives are weakest for directors closer to retirement. After controlling for difference in implicit incentives, the inverted U-shaped relation between board tenure and firm value remains.

Gibbon and Murphy (1992) further argue that optimal compensation contract optimize total incentives: the combination of implicit incentives from career concerns and explicit incentives from compensation contract. The above regressions have examined two incentives in isolation. Column 3 controls for both aspects of incentives and finds that the inverted U-shaped relation between board tenure and firm value remains.

[26] http://content.spencerstuart.com/sswebsite/pdf/lib/ssbi2010.pdf

[27] I do not control for average age of insiders, given that CEOs are usually the only insiders on the board and I already control for CEO age in the baseline specification. In an alternative specification where I control for average age of insiders and drop 'CEO age' from the regression, the results are nearly identical.

4. Corporate Decisions

If the relation between board tenure and firm value reflects an underlying trade-off between knowledge and entrenchment, then the same tradeoff should also be reflected in corporate policies and decisions. In this section I examine how board tenure is associated with decisions related to a firm's: 1) M&A performance (Masulis, Wang, and Xie, 2007), 2) financial reporting quality (Biddle, Hilary, and Verdi, 2009; Dechow and Dechiv, 2002; Khan and Watts, 2009), 3) change in strategic direction (Finkelstein and Hambrick, 1990; Hirshleifer, Hsu and Li, 2012), 4) compensation practices (Bebchuk, Grinstein, and Peyer, 2010), and 5) CEO replacement (Weisbach, 1995).

4.1. M&A performance

Acquisitions are among the largest and most easily observed form of corporate investment that is directly influenced by board decisions. Masulis, Wang, and Xie (2007) find that announcement returns are significantly lower for acquirers with higher entrenchment levels, and conclude that lower announcement returns might be attributable at least in part to bad acquisitions. I investigate whether board tenure and its squared term have additional explanatory power for acquisition returns. Announcement returns are a market-based way of measuring firm value creation. I expect the relation between announcement returns and board tenure to exhibit a similar inverted U-shape as the relation between Tobin's Q and board tenure. The rationale is that an increase in firm-specific knowledge associated with an increase in tenure allows the board to make better acquisition decisions that are welcomed by the market. However, the complicity that develops between the board and management over time may prevent it from being an effective and objective monitor of management's acquisition decisions. An entrenched board may therefore approve unprofitable acquisitions that are less well received by the market.

To empirically test the relation between board tenure and M&A performance, I obtain a sample of acquisitions from the Securities and Data Corporation's (SDC) Merger and Acquisitions database. Following Masulis et al. (2007), I impose the following filtering criteria on the data:

1. The acquisition must be completed.
2. The acquirer must control less than 50% of the target's shares prior to the announcement and own 100% of the target's shares after the transaction.
3. The deal value must be disclosed in SDC and exceed one million dollars.
4. The acquirer must be included in the IRRC database with valid GIM index and tenure information.

5. The relevant financial information and share price information are available from Compustat and CRSP.

The above filters result in a sample of 2,696 acquisitions made between 1998 and 2006[28]. IRRC reports the GIM index in alternating years; following Gomper et at. (2003) and Masulis et al. (2007), I assume that in the years between consecutive reports, governance provisions are the same as in the previous reporting year. I measure bidder announcement returns over two event windows: CAR [0,1] measures announcement returns over 2-day event windows and CAR [-2,2] measures five-day announcement returns, where day 0 is the acquisition announcement date provided by SDC. I use the CRSP value-weighted return as the market return and estimate market model parameters over the 200-day period from event day -210 to event day -11. The choice of model and parameters are similar to those used in Masulis et at. (2007), which allows me to benchmark my results against prior studies. For this sample, I find an average abnormal announcement return for the 5 days around the announcement date of 0.21%, which is very similar to the value of 0.22% reported by Masulis et al. (2007). It is therefore unlikely that the additional restrictions imposed by the availability of tenure information introduce any sample bias.

I control for bidder characteristics and deal characteristics that are related to acquirer returns. For bidder characteristics, I control for firm size (Moeller, Schlingemann, and Stulz , 2004), firm age, riskiness of the stock, Tobin's Q (Lang, Stulz, and Walking, 1991; Servaes, 1991), free cash flow (Jensen,1986) and leverage (Garvey and Hanka, 1999), all of which are measured at fiscal year end prior to the acquisition announcement. For deal characteristics, I control for target ownership status, method of payment, relative deal size and industry relatedness of the acquisition. Moeller, Schlingemann, and Stulz (2004) find that acquirers experience negative announcement returns when buying public firms and positive announcement returns when buying private firms or subsidiaries. To take this into account, I create a dummy variable denoted by 'Target public' to indicate that target is a public firm. Method of payment is also related to announcement returns. Bidders experience negative announcement return when they pay for their acquisitions with equity (Masulis et al 2007; Moeller, Schlingemann, and Stulz, 2004). Moeller, Schlingemann, and Stulz (2004) also find that bidder announcement returns increase in relative deal size, but reverse is true for the subsample of large bidders in Moeller et al (2004). Finally, industry characteristics may also affect announcement returns. I control for non-time variant industry characteristics by industry fixed effects at Fama-French 48 industry level. To capture industry relatedness in acquisition, I create a dummy variable, diversifying acquisition, that is equal to one if acquirer and bidder do not share a Fama-French industry.

Table 7 reports the results. Column 1 (Column 2) presents results for an OLS regression in which the two-day (five-day) announcement return is the dependent variable. Under the OLS specification, I find an inverted U-shaped relation between acquisition announcement returns and

[28] GIM index is only available up to 2006.

board tenure using announcement returns calculated over either event windows. The economic impact of board tenure varies with tenure length. At an average tenure of three years, a one-year increase in board tenure is associated with a 0.24% increase in the five-day announcement return. At an average board tenure of 20 years, a one-year increase in tenure is associated with a 0.1% decrease in the five-day announcement return. Most of the parameter estimates for control variables are consistent with Masulis et al (2007). I find a negative relation between the GIM index and announcement returns, which suggests that board tenure has additional explanatory power over and above the GIM index.[29] I find that announcement returns are lower for larger acquisitions or when target is a publicly traded firm. Tobin's q has a negative impact on bidder return. Announcement returns are higher for all cash acquisitions. Bidder returns are lower, albeit insignificantly, for diversifying acquisitions. Column 3 presents results for a logit regression in which the dependent variable is equal to one if the CAR[-2,2] is negative and zero otherwise. It shows that the likelihood of engaging in a value-destroying acquisition is first decreasing and then increasing over time, supporting the view that learning improves the quality of acquisitions, while entrenchment destroys value.

In sum, this analysis shows that a potential reason for the hump-shaped relation between firm value and board tenure is that short-tenured boards are less likely to engage in value-destroying acquisitions, and acquisitions that they do pursue are more positively received by the market, while the reverse is true for long-tenured boards.

4.2. Financial reporting quality

A number of prior studies examine relation between board characteristics and financial reporting quality. For example, Beasley (1996) and Farber (2005) show that greater presentation of independent directors reduces the likelihood of fraud. Klein (2002) and Xie, Davidson and DaDalt (2003) find a negative relation between the percentage of outside directors and earnings management, suggesting that board structured to be more independent of the CEO may be more effective in monitoring the corporate financial reporting process. This section examines whether board tenure is associated with financial reporting quality.

I use four different proxies for financial reporting quality. The first measure is accrual quality (AQ) measure derived from Dechow and Dechiv (2002), which has been used extensively in the prior literature. The measure is based on the idea that accruals are estimates of future cash flows and earnings will be more predictive of future cash flow when there is lower estimator error embedded in the accrual process. I estimate discretionary accruals using the Dechow and Dechiv (2002) model augmented by the fundamental variables in the Jones (1991) model as suggested by McNichols (2002). The model is a regression of working capital accruals on current, future and past cash flows plus the change in revenue and PPE. Following Francis et al (2005), I estimate Dechow and Dechiv model cross-sectional for each industry with at least 20

[29] Using the Entrenchment index of Bebchuk, Cohen, and Ferrell (2009) in place of the GIM index yields similar results.

observations in a given year based on Fama-French 48 industry classification. AQ at year t is defined as the standard deviation of the firm-level residuals from the Dechow and Dechiv model during the years t-5 to t-1. I multiply the standard deviation by negative one so that AQ is increasing in financial reporting quality.

To avoid concerns regarding measurement of accrual quality, the second proxy for financial reporting quality is FOG Index based on Li (2008), which measures financial reporting transparency. The idea is that manager can obfuscate quality of financial report by making it harder to read. Li (2008) develops the FOG index as a measure of readability of financial report and shows that a large FOG index is associated with a lower earning persistence and lower future earnings. I derive FOG index from Li's website[30] and I multiply it by negative one so that it is increasing in reporting quality.

The third proxy I use is the accounting conservatism measure (CScore) based on Khan and Watts (2009). Watts (2003) argues that conservatism constrains managerial opportunistic behavior and offsets managerial biases with its asymmetrical verifiability requirement and is likely to be an efficient financial reporting mechanism in absence of contracting. CScore is constructed based on Basu's (1997) model as follows.

$$X_i = \beta_1 + \beta_2 D_i + \beta_3 R_i + \beta_4 D_i * R_i + e_i,$$

Where X is earnings over the market value of equity at the prior fiscal year end, R is the annual stock return, D is a dummy variable that is equal to one if R < 0 and zero otherwise. β_4 measures the incremental timeliness for bad news over good news, namely, accounting conservatism. Khan and Watts (2009) assume that both β_3 and β_4 are linear functions of firm-specific characteristics each year.

$$\beta_3 = \mu_1 + \mu_2 Size_i + \mu_3 MB_i + \mu_4 Lev_i$$
$$CScore = \beta_4 = \lambda_1 + \lambda_2 Size_i + \lambda_3 MB_i + \lambda_4 Lev_i,$$

Where Size is the log of the market value of equity, MB is the ratio of market value of equity to book value of equity, and Lev is total debt divided by the market value of equity. Thus, the annual cross-sectional regression model used to estimate CScore can be written as

$$X_i = \beta_1 + \beta_2 D_i + R_i(\mu_1 + \mu_2 Size_i + \mu_3 MB_i + \mu_4 Lev_i) + D_i R_i(\lambda_1 + \lambda_2 Size_i + \lambda_3 MB_i + \lambda_4 Lev_i)$$
$$+ (\delta_1 Size_i + \delta_2 MB_i + \delta_3 Lev_i + \delta_4 D_i Size_i + \delta_5 D_i MB_i + \delta_6 D_i Lev_i) + \varepsilon_i,$$

Where coefficients δ_1- δ_6 capture the independent effects of firm specific variables and their interactions with D on earnings, while coefficients λ_1 - λ_4 are used to construct CScore. I estimate above equation cross-sectionally for each industry with at least 20 observations in a given year based on Fama-French 48 industry classification.

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[30] http://webuser.bus.umich.edu/feng/

Finally, I form a summary statistic for financial reporting quality by normalizing above three proxies (AQ, FOG and CScore) and taking the average of these three measures. I use this summary measure (FRQ) as a fourth measure of reporting quality.

Table 8 reports the results. I find that financial reporting quality first increases and then decreases with board tenure using all four measures of financial reporting quality. Both linear and squared terms of board tenure are statistically significant at conventional level. The results are consistent with the interpretation that board's understanding of business improves quality of information provided to the shareholders. Over time, entrenchment of board creates additional agency problems and financial reporting quality suffers.

4.3. Option backdating

Yermack (1997) and Lie (2005) find that option grants are opportunistically timed, typically after a period of negative abnormal returns and preceding a period of positive abnormal returns. This evidence suggests that abnormal returns around CEO option grants are due at least in part to backdating. Bebchuk, Grinstein, and Peyer (2010) provide further evidence that both the CEO and directors receive option grants for which the exercise price is deliberately timed to coincide with the lowest share price of the month. Such opportunistic timing of option grants reflects a breakdown in corporate governance and raises a red flag about the effectiveness of the board as a corporate watchdog. This section considers whether opportunistic timing is systematically related to board tenure. If a relatively short-tenured board has the least familiarity with (i.e., most independence from) management, then the likelihood of opportunistic timing of options should be relatively low. Learning may aid the board in discovering and correcting malpractice in terms of compensation awards. In contrast, a long-tenured board may make fewer changes to compensation practices, and the erosion of their independence may induce them to engage in option backdating, especially when they are the direct beneficiaries of such practices.

Following Bebchuk, Grinstein, and Peyer (2010), I examine a particular type of option grant, namely, a 'lucky grant', where the exercise price of the grant coincides with the lowest share price of the month. Data on executive lucky grants are available from Lucian Bebchuk's website; the sample period is from 1998 to 2006.[31] I run two logit regressions. The dependent variable is a 'lucky' dummy equal to one if the firm granted its CEO (director) a lucky option grant during the year, and zero otherwise.

The results are displayed in Table 9. I find a U-shaped relation between board tenure and option backdating for directors, as shown in column 1 of the table. However, such a relation is not evident in the opportunistic timing of CEO option grants. In untabulated results, I also

[31] The Bebchuk dataset stops at 2006, which limits the sample available for this analysis. However, as shown in Bebchuk et al (2010), option backdating subsequent to the 2006 publication of the Wall Street Journal article on backdating is exceedingly rare.

investigate whether the level of CEO compensation is related to board tenure. The results show that board tenure does not have explanatory power beyond other firm and governance variables known to be related to compensation. Overall, the results suggest that the board independence restrains directors from engaging in option backdating. However, such independence is lost as board tenure increases, and hence the likelihood of engaging in option backdating increases.

4.4. Corporate strategy and innovation

Management literature shows that organizational tenure is associated with rigidity and a commitment to established policies and practices. March and March (1977) find that executives with a short tenure have fresh insights and are willing to take risks, often departing widely from industry conventions. As tenure increases, perceptions become more restricted and risk-taking is avoided. In a study of U.S. railroads, Grimm and Smith (1990) find that the tenure of top executives in the railroad industry was inversely related to the degree to which their firms changed strategies after deregulation. Other studies examine critical transitions in the airline, banking, and steel industries, concluding that in each of these industries, long-tenured executives had great difficulty transcending (Goodman, 1988; Macrus and Goodman, 1986). Similar to prior studies on management tenure, tenure on the board may also affect directors' perceptions. Short-tenured boards are likely to be more open-minded and more willing to initiate organizational change. The initial learning period helps them understand organizational problems and establish a new direction. Over time, however, organizational tenure may restrict information processing through the establishment of routines and the use of the same information sources (Miller, 1991). They may also be more inclined to follow those approaches that have been effective in the past, resulting in a U-shaped relation between strategic persistence and board tenure.

To test the empirical relation between strategic persistence and board tenure, I construct a strategic persistence measure that closely follows Finkelstein and Hambrick (1990). In particular, I used six strategic indicators to create a composite measure of persistence: 1) R&D intensity, 2) PPE newness, 3) advertising intensity, 4) nonproduction overhead, 5) inventory level, and 6) financial leverage. These dimensions are chosen because they are used extensively in the strategy literature and each indicator focuses on a strategic area that is value relevant. R&D intensity, PPE newness, and advising intensity capture basic resource allocations; nonproduction overhead captures a firm's expense structure; inventory level captures working capital management; and financial leverage captures a firm's financing policy. The composite persistence measures are calculated as follows: treating t as the focal year, I compute the firm's five-year (t-2 through t+2) variance for each strategic dimension.[32] Next, I standardize variance scores for each dimension by subtracting the minimum and scaling by the range of the variance at the three-digit SIC level. I then multiply each standardized value by minus one to bring the measures in line with the

[32] I use this time period because I am interested in capturing changes from before the focal year to after. A similar time period and construction method is used by Finkelstein and Hambrick (1990).

concept of persistence (i.e., an absence of strategic variance over time). The composite measure is the sum of all six dimensions.[33]

Column 1 of Table 10 presents the regression results. Consistent with my expectation, I find a U-shaped relation between strategic persistence and board tenure. A short-tenured board engages in more strategic experimentation and changes, and may deviate widely from industry patterns. As board tenure increases, less strategic changes are made and firms tend to maintain the status quo.

An alternative way to measure strategic persistence is to examine innovative activity. Innovation is a dramatic way of not following status quo but instead introducing new ideas or approaches to a company or industry. Similar to the rationale for strategic persistence, a short-tenured board is more likely to undertake innovative activities, an outcome of which is captured by the number of patent filings and number of patent citations. Conversely, a long-tenured board is more likely to follow whatever approach worked best in the past and therefore is less likely to undertake innovative activities. I extract the patent filings and citations from the NBER patent database for the 1998 to 2006 period.

Column 2 of Table 10 reports the results. In column 2, the dependent variable is a dummy equal to one if a company files for a patent in that year and in column 3, the dependent variable is a dummy equal to one if a company receive a citation[34]. Since Hall and Ziedonis (2001) argue that large, mature, and capital-intensive firms are associated with more patents and citations. I control for firm size, age and R&D expenditure. Hirshleifer, Low, and Teoh (2011) find that high innovation productivity is associated with better firm performance, I include ROA and lagged Tobin's Q in the regression. Chan, Lakonishok, and Sougiannis (2001) show that R&D intensive firms are associated with higher stock return volatility. Therefore, I include standard deviation of stock returns over past year as an additional control. Consistent with my expectations, I find that a short-tenured board is associated with an increase in the likelihood of filing a patent (receiving a patent citation), while a long-tenured board is associated with a reduction in the likelihood of filing a patent (receiving a patent citation).

Taken together with the strategic performance regression, the results above suggest that short-tenured boards create value by bringing a new strategic direction to the firm or by overhauling out-dated practices through innovation. Conversely, longer-tenured boards are associated with a lack of strategic adjustments, which may be one of the reasons for a performance decline as tenure lengthens over time.

4.5. CEO replacement

[33] Missing R&D (advertising) information is replaced by zero and a RD (advertising) missing dummy is set to one.
[34] I do not find an association between board tenure and number of patent filing (citations). The results are not reported here.

Another benefit of independent directors is increased monitoring: relative to insiders, independent directors should be more willing to vote against managerial initiatives that are harmful to shareholders. In the case of CEO replacement decisions, independent directors should be more willing to replace non-performing CEOs. Conversely, a board whose directors are friendlier toward management may be less willing to take actions against non-performing CEOs, ultimately destroying firm value. This leads to prediction that the decay in independence over time will reduce the likelihood of replacing non-performing CEO. On the other hand, as tenure advances, increased firm-specific knowledge may improve a board's assessment of the CEO's competence to lead the firm and therefore makes CEO turnover more sensitive to bad performance. This leads to the prediction that CEO performance turnover sensitivity increases with tenure up to some threshold, at which point entrenchment dominates and turnover decisions are no longer responding or less responding to bad performance.

CEO replacements are identified from the Execucomp database, where a CEO is taken to be replaced if for firm i the CEO in year t is different from the CEO in year t+1. I further classify CEO turnovers as forced turnovers or voluntary turnovers. Following prior research, a CEO replacement is considered non-voluntary if the departing CEO is below the retirement age of 62. Over the 1998 to 2009 sample period, I identify 1,055 CEO turnovers, of which 568 are treated as forced turnover. The average stock return in the last fiscal year prior to a forced CEO turnover is -12.6%.

I control for CEO and firm characteristics that are known to affect replacement decisions. Powerful CEOs may exert significant influence over the choice of replacement (Hermalin and Weisbach, 1998). I use CEO-Chairman duality as a proxy for CEO power. CEOs with significant ownership are less likely to be replaced (Bushman, Dai and Wang, 2010) and CEOs that are closer to retirement age are more likely to be replaced (Kaplan and Minton, 2008). Stock return is calculated over last fiscal year prior to the replacement of CEOs. Kaplan and Minton (2008) and Jenter and Kanaan (2008) show that both firm-specific and systematic component of stock returns significantly influences the likelihood of CEO turnover, suggesting that CEO replacement decisions are influenced by factors that beyond their controls. I start out by using aggregate firm level stock returns and then decompose the returns into firm-specific and systematic components. In a similar spirit, Bushman, Dai and Wang (2010) show that CEO performance turnover sensitivity is increasing in idiosyncratic risk and decreasing in systematic risk, complementing Jenter and Kanaan (2008) paper that the ability of boards to learn about CEO talent from firm performance depends crucially on the underlying sources of the risk and the returns. Following Bushman et al (2010), I control for both systematic and idiosyncratic risk of stocks. I further control for CEO tenure, accounting performance measure (ROA) along with year fixed effects. All the independent variables are as at last fiscal year end prior to the replacement.

Table 11 presents the results. Column 1 presents the results without controlling for board tenure. Consistent with prior studies, I find that CEO turnover is negatively related to stock performance. For a 50% decline in performance, the probability of CEO replacement increases by 21.8% (exp(-0.5*-0.395)-1). Control variables are in line with prior studies as well. I find that probability of CEO turnover is positively related to CEO age and idiosyncratic risk and is negatively to CEO ownership, systematic risk and accounting performance measure. Column 2 examines whether board tenure has additional explanatory power to the CEO performance turnover sensitivity. To better explore potential non-linearity in the performance-turnover relation, I classify board tenure into three groups: board tenure less than 8 years, board tenure between 8 years and 10 years and board tenure above 10 years. The choice of cutoffs is based on the results from Table 2 that optimal board tenure is between 8 to 10 years. I further interact each tenure dummy with stock returns. I do not use quadratic specifications of board tenure in this case because CEO turnover sensitivity could stay irresponsive to bad performance when board tenure is long. Column 2 shows that when average board tenure is less than 8 years, there is a higher unconditional probability of replacing a CEO. For a firm with average tenure of less than 8 years, a 50% decline in stock returns will increase CEO turnover probability by 15% (exp(-0.5*-0.28)-1). The performance turnover sensitivity is at the highest when board tenure is between 8 and 10 years. For such firms, a 50% decline in stock returns will increase CEO turnover probability by 36% (exp (-0.5*-0.614)-1). However, for firms with long tenured boards, the turnover probability is not sensitive to performance. Column 3 and 4 distinguishes between forced CEO turnover and voluntary CEO turnover and the results show that my main results are driven by forced CEO turnover. Column 5 decomposes the stock returns into firm-specific returns and market returns, where firm-specific returns are defined as the difference between overall returns and market returns. Each tenure dummy is then interacted with these two components of returns. Consistent with Jenter and Kanaan (2008) and Kaplan and Minton (2008), I find that CEO turnover is sensitive to both firm-specific and market-specific returns, but only among firms with board tenure less than 10 years. For long tenured board, the CEO replacement decisions are not based on either firm or market returns.

The main conclusion is that CEO turnover is more sensitive to firm specific returns for firms with shorter board tenure. If low or no performance sensitivity is an indication of agency problems (Kaplan and Minton, 2008), then not replacing a non-performing CEO is costly to a firm and as a result, firm performance suffers.

5. Robustness tests

5.1. Insider tenure

The value contribution of insider board members may also change with their tenure. A number of studies in the management literature examine how CEO tenure is related to firm value. Hambrick and Fukutomi (1991) provide a conceptual framework for the time-series pattern of the effect of CEO tenure on firm value, identifying two phases. The first is an initial period of adaptive learning, whereby new CEOs gain knowledge about the firm and address the structural and organizational challenges it faces. The firm's performance generally improves over this initial period. After some time, risk-aversion (McDonald and Westphal, 2003), information restriction (Katz, 1982; Miller, 1991), preference for the status quo (March and March, 1977; Steven, Beyer, and Trice, 1978; Hambrick, Geletkanycz, and Fredrickson, 1993), and entrenchment (Miller, 1991) take over, leading to a downturn in firm performance.

The above studies suggest that executive directors may not behave uniformly over the tenure of their directorship. To ensure that the paper's results are not driven by changes in the behavior of insider directors, Panel A of Table 12 adds squared insider board tenure to the specifications. I include the same set of control variables as in column 1 of Table 2, though the coefficients on the controls are omitted for brevity. The results show that both insiders and outsiders face a trade-off between learning and entrenchment, with the average tenure of both insiders and outsiders exhibiting an inverted U-shaped relation with firm value. These results imply that the dynamic trade-off between knowledge and entrenchment may apply to the entire board. Panel B of Table 12 explores this idea in more detail. I calculate the average tenure of all directors (both insiders and outsiders) on the board; the results show that aggregate board tenure has a hump-shaped relation with firm value.

5.2. Regulated industries

Utility and financial firms are under heavy government regulation and may have different corporate governance practices than other firms. Given that these two industries comprise roughly 15% of my sample, for robustness I re-run my baseline regression excluding these industries to ensure that the paper's results are not driven by different corporate governance practices in these industries. Panel C of Table 12 shows that after excluding regulated industries, the main results remain.

5.3. Measurement errors

As described in the data section, I explicitly adjust directors' tenure to reflect the actual length of time spent with each firm. Though the aim of this adjustment is to correct for errors in the database, it may introduce measurement bias at the director level and carry through to the board tenure measures in a systematic way, biasing the results. For robustness, I re-run the baseline regression excluding those firm-year observations for which adjustments to tenure have been made. The results remain unchanged (see Panel D of Table 12).[35]

I cannot correct for all possible measurement errors in the sample as the electronic filing of proxy statements is mainly available from 1998 onwards. It is possible, for instance, that some firms have already adjusted the way they calculate director tenure (e.g., from the day of

[35] To further ensure consistency and accuracy in the disclosure, I randomly select 100 firms to manually check their directors' tenure information against earliest and latest proxy filings. All of the tenure information is consistent with the disclosures in the proxy filings.

shareholder ratification or from the day of corporate transformation) and such changes are reflected in all available electronic proxy filings, leaving them undetected in the current data screening process. However, as long as those errors are distributed randomly across firms, they should not bias the results in any particular way. In Panel E, I further exclude the top and bottom one percentile of board tenure to allow for the possibility that any undetected adjustments may make board tenure unusually longer or shorter than it should be. The inverted U-shaped relation between board tenure and firm value remains.

5.4. Persistence in governance practices

Another possible concern is that board tenure practices are relatively persistent over time, suggesting that the annual firm-level observations in my sample may not be independent. I have used robust standard errors clustered at the firm level in the regressions to explicitly account for potential rigidity in tenure practice. An alternative way to address this concern is to restrict observations to every second year, as in Linck, Netter, and Yang (2008) and Bouwman (2011), to minimize the impact of intertemporal rigidity on the results.[36] Panel F of Table 12 contains the results. As is evident, limiting the sample period to alternating years does not materially affect the level of the coefficients or the statistical significance of the results.

Pontiff (1996) suggests using Fama-MacBeth (1973) estimates with modified standard errors to account for within-firm autocorrelation. Accordingly, I separately estimate each regression specification as a cross-sectional regression for each year of the sample. I then adjust the Fama-MacBeth estimates for autocorrelation using a method suggested by Pontiff (1996). Specifically, I regress year-by-year coefficients for each variable on a constant, but allow the error term to be estimated as an autoregressive process. The intercept and its standard error in this regression are autocorrelation-consistent estimates of the mean and standard error for that coefficient. I employ a third-order autoregressive process for the error term.[37] Similar procedures are also used by Cornett, Marcus, and Tehranian (2008). Panel G of Table 12 reports the results. Both linear and quadratic terms for board tenure are statistically significant, and the magnitudes of the coefficients are comparable with those in the baseline regression, suggesting that the main results are less likely to be driven by persistence in governance practices.

6. Conclusion

In this paper I empirically investigate how board tenure is related to firm performance and corporate decisions, holding other firm, CEO, and board characteristics constant. I find that board tenure has an inverted U-shaped relation with firm value, and that this curvilinear relation

[36] The results remain similar if I include observations for every third year.

[37] The choice of the number of lagged terms in the AR process is mainly restricted by the relative short time series of data. As long as the third-order autoregressive process captures all of the serial dependence, the standard errors are not biased by serial or cross-sectional correlation.

is reflected in various corporate decisions such as M&A performance, financial reporting quality, corporate strategies and innovation, executive compensation, and CEO replacement. The results indicate that, for firms with short-tenured boards, the marginal effect of board learning dominates entrenchment effects, whereas for firms that have long-tenured boards, the opposite is this case.

My empirical analysis identifies nine years as the empirically observed optimal tenure using a sample of S&P 1500 firms. However, as I discuss in the paper, firms with different benefits of learning and costs of entrenchment may have a different optimal tenure structure. Recently a number of governance reform proposals have singled out boardroom tenure as an explicit indicator for which a strict limit should be set. My paper is the first empirical analysis to focus on the effect of board tenure. The paper shows that board tenure can be positively or negatively related to firm value and corporate decisions, and that this relation varies across industries and firms characteristics, suggesting that a 'one size fits all' regulation may not lead to the intended outcomes.

Overall, my analysis indicates that board tenure matters as it is related to firm value and corporate policies above and beyond other commonly examined firm and board characteristics. The results highlight a time-varying trade-off between knowledge and entrenchment for board effectiveness, which should be taken into account when designing board structure.

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Figure 1

Figure 1 plots the Tobin's Q as a function of board tenure and board tenure squared using the estimated coefficients from Table 2 Column 1, while holding all the control variables at their respective means.

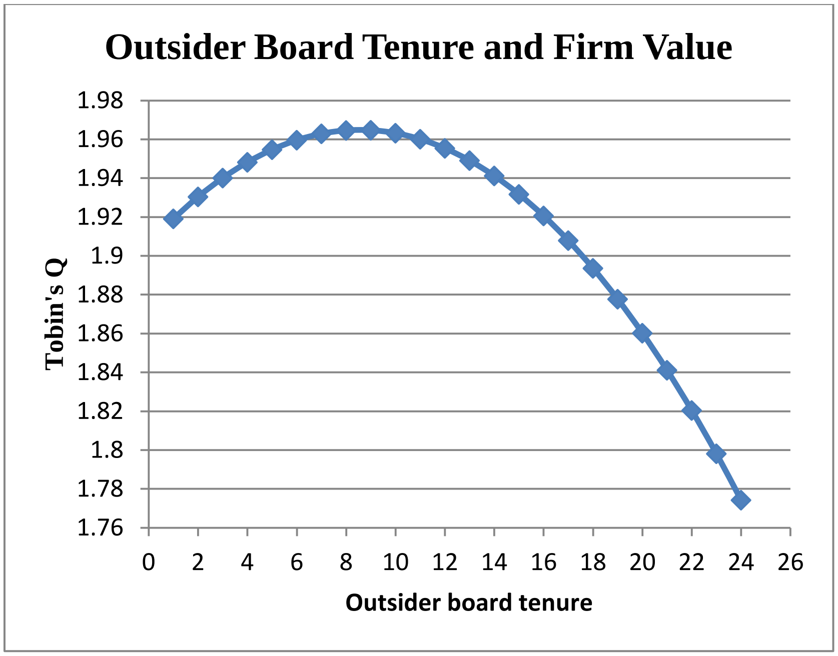


Figure 2 Non-parametric Plot of Firm Value against Board Tenure

Figure 2 plots the fitted values from locally weighted regression (Lowess) of Tobin's Q on board tenure. The bandwidth is 0.6. Lowess regression provides a non-parametric way of estimating the relation between firm value and board tenure. To reduce the influence of other variables that would affect firm value, I partial out lagged firm performance (ROA), firm age, firm specific effects as well as time effect from Tobin's Q before estimating lowess regression.

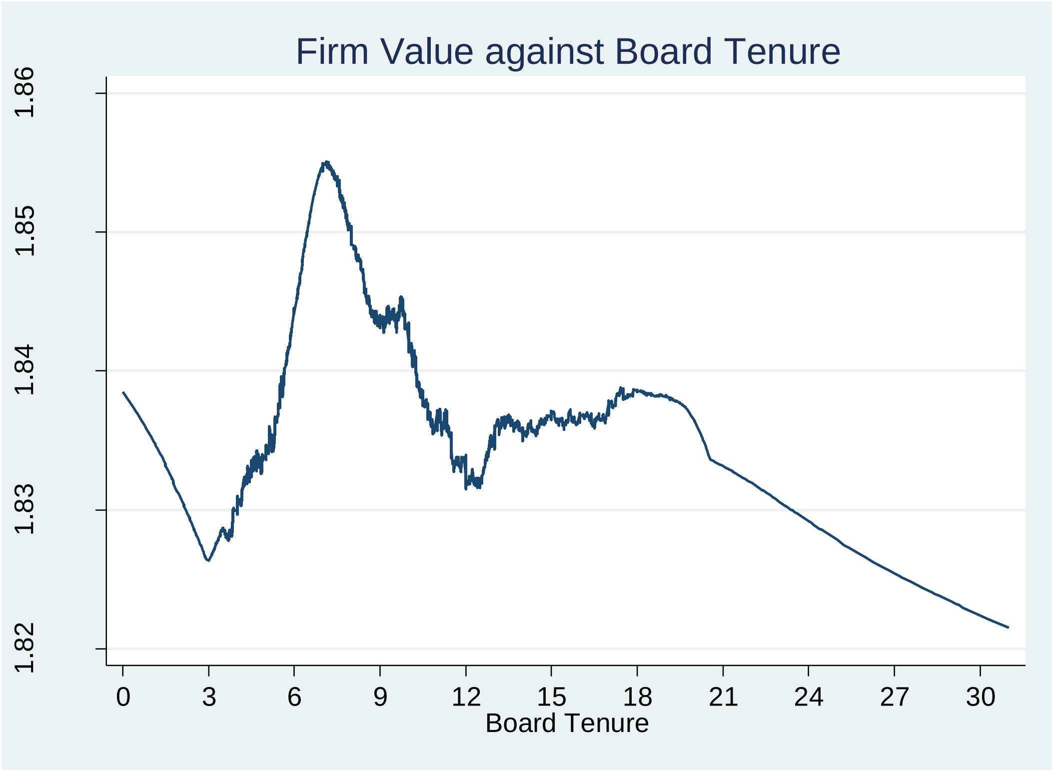


Figure 3 (a) Director Turnover

Figure 3(a) plots average percentage of director turnover over the sample period. I require firms to have at least two consecutive years of board information. Director turnover ratio is calculated as the percentage of directors that do not appear in next year's proxy statement. Blue solid line plots the average turnover ratio for outside directors and red dotted line plots the average ratio for all directors.

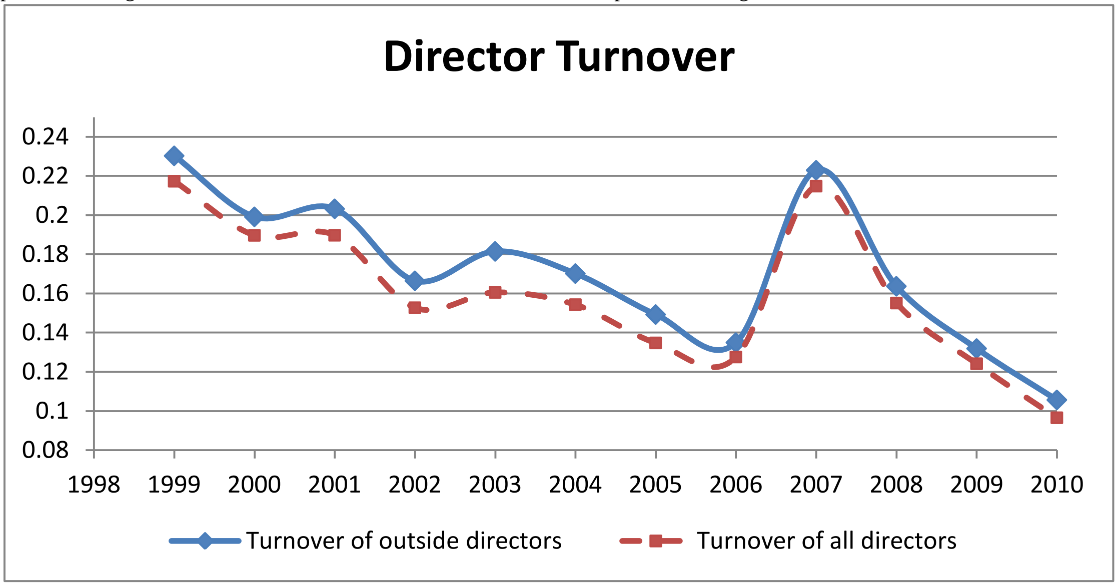


Figure 3 (b) Percentage of firms that do not change board composition

Figure 3(b) plots the percentage of firms that do not change board composition over the sample period. I require firms to have at least two consecutive years of board information. Blue solid line plots the percentage of firms that do not change outside directors and red dotted line plots the percentage of firms that do not change any directors on board.

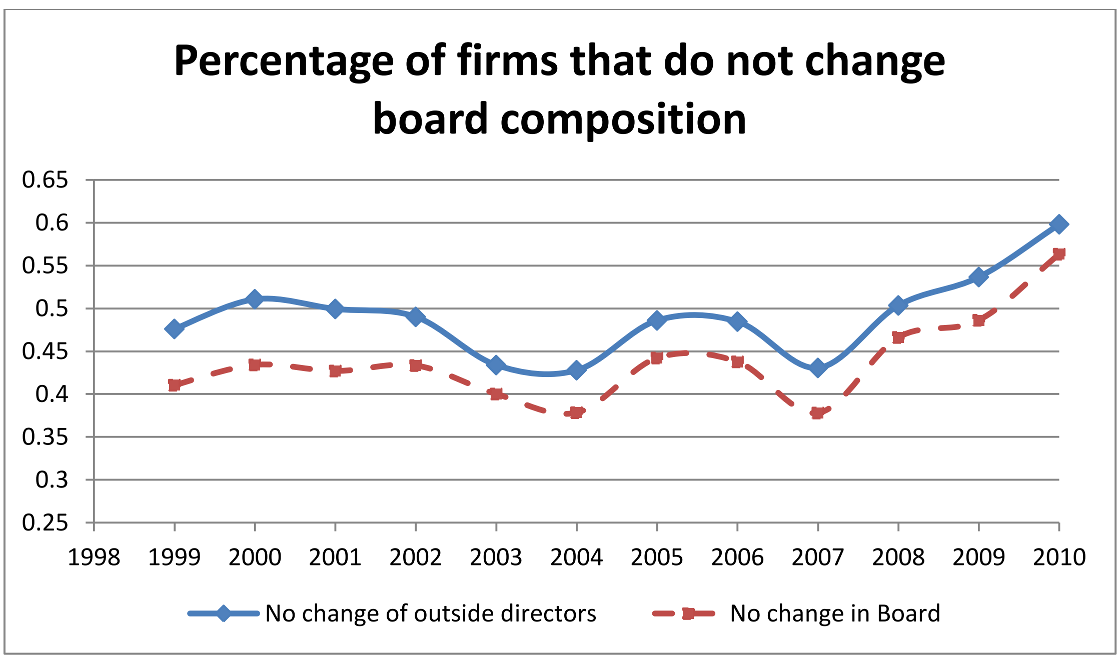
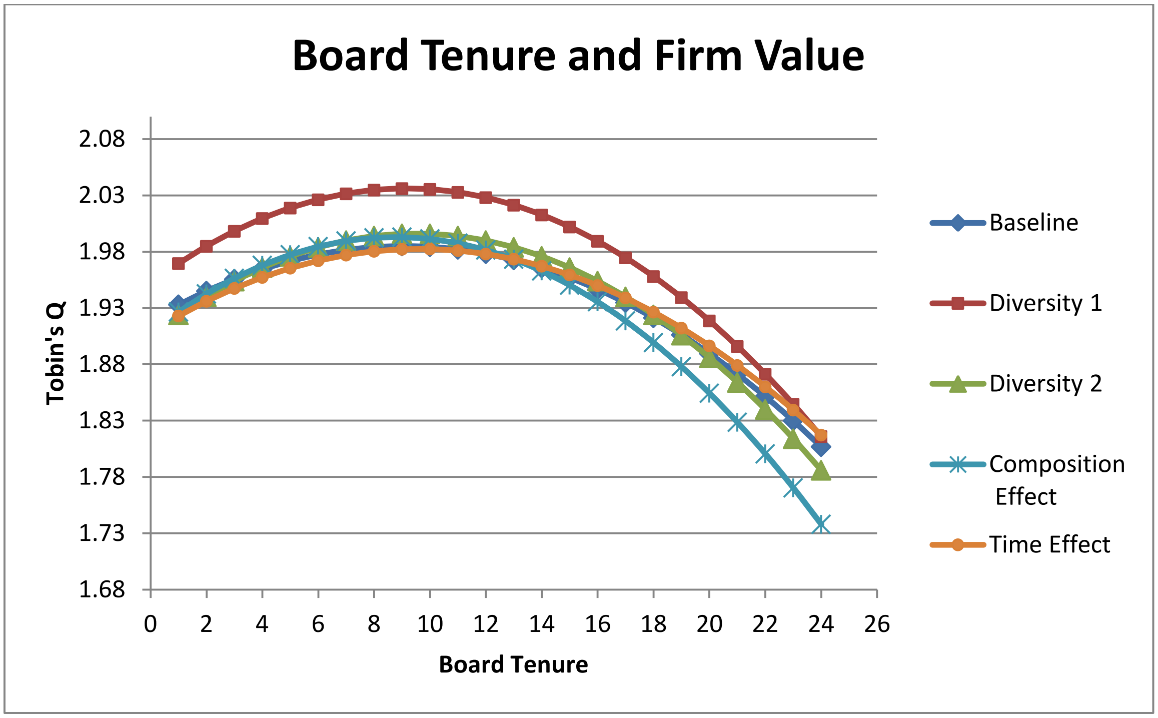


Figure 4

Figure 4 plots the Tobin's Q as a function of board tenure and board tenure squared using the estimated coefficients from Table 2 while holding all the control variables at their respective means. The empirically observed value-maximizing board tenure that corresponds to each regression specification in Table 2 is reported under the figure.



	Baseline	Diversity 1	Diversity 2	Composition Effect	Time effect
Tenure at Peak	9.07	9.16	9.50	8.77	9.625

Table 1 Summary Statistics

The sample period is from 1998 to 2010. The firm-year observation is only included when I can locate the tenure information for each of the director sitting on the board. The board information is from IRRC database. The CEO information is from Execucomp and financial information is from Compustat and CRSP database. All monetary items are adjusted for inflation using 2002 as the base year. The 'Correlation' column reports correlation between board tenure and other variables. The effective tenure of director is calculated as the year of annual meeting (IRRC variable *meetingdate*) minus the start year of directorship (variable *dirsince*) minus any breaks in the service of directorship (indicated by variable *priorserv*). 'Board (insider) tenure' is the average of the tenure of all outsider (insider) directors sitting on the board. 'Board tenure diversity' is calculated as standard deviation of tenure of all outsider directors in a given year. 'CEO ownership' is a dummy equal to one if CEO owns more than 20% of shares outstanding. 'CEO-Chair' is a dummy equal to one if CEO is also the chairman of board. 'Classified board' is a dummy equal to one if the board is staggered. 'Independent board' is a dummy equal to one if the board has majority of independent directors. 'Busy board' is a dummy equal to one if a majority of directors holds more than three directorships. 'Blockholder on board' is a dummy equal to one if at least one director holds over 5% of the shares outstanding. 'Interlocked board' is a dummy equal to one if the board is interlocked with another company as defined by Execucomp. 'Board size' is the number of directors. 'Tobin's Q' is the market value of equity (item #25 multiply item # 199) plus the book value of assets (item #6) minus the sum of book value of common equity (item #60) and deferred taxes (item # 74), all divided by the book value of assets. 'Firm age' is the number of years since the firm is first listed in CRSP database. 'Complex firm' is constructed following Coles, Daniel and Naveen (2008). It takes value of one if the complexity score of the firm is above median, where the complexity score is the first factor from factor analysis of firm log sales (item #12), leverage (item #9 plus item #34, all divided by item #6) and number of business segments (from Compustat Segment database). 'ROA' is the log of one plus operating income before depreciation (item #13) over lagged total asset (item #6). 'Growth opportunities' is measured by the ratio of capital expenditure (item # 128) and lagged total assets (item #6). 'Risk' is the log of the standard deviation of daily stock returns over the past fiscal year. ***, **,* denote significance at 1%, 5% and 10% level.

	N	Mean	Median	Std Dev	Min	Max	Correlation
Average Tenure							
Board tenure	13989	8.35	7.75	3.78	0.00	31.00	
Board tenure diversity	13989	5.33	4.91	3.00	0.00	23.60	0.46***
Insider tenure	13989	10.04	8.00	7.61	0.00	51.00	0.27***
CEO Characteristics							
CEO age	13989	55.67	56.00	7.31	31.00	94.00	0.16***
CEO ownership >20%	13989	0.03	0.00	0.17	0.00	1.00	0.05***
CEO-Chair	13989	0.61	1.00	0.49	0.00	1.00	-0.04***
Board Characteristics							
Classified board	13989	0.58	1.00	0.49	0.00	1.00	0.01
Independent board	13989	0.85	1.00	0.36	0.00	1.00	-0.13***
Busy Board	13989	0.08	0.00	0.28	0.00	1.00	-0.04***
Blockholder on board	13989	0.12	0.00	0.33	0.00	1.00	0.15***
Interlocked Board	13989	0.05	0.00	0.21	0.00	1.00	0.03***
Board size	13989	9.21	9.00	2.38	3.00	34.00	0.06***
Firm Characteristics							
Tobin	13989	1.84	1.49	1.06	0.72	7.48	-0.01
Firm age	13989	25.83	19.00	19.56	1.00	85.00	0.20***
Complex firm	13989	0.51	1.00	0.50	0.00	1.00	0.05***
Ln(1+ROA)	13989	0.15	0.15	0.10	-1.42	1.22	0.01
Growth opportunities	13989	0.06	0.04	0.07	0.00	1.09	-0.01
Risk	13989	-3.68	-3.69	0.44	-5.36	-1.64	-0.10***

Table 2 Board Tenure and Firm Value

The sample period is from 1998 to 2010. Dependent variable is Tobin's Q and is truncated at top and bottom 1 percentile. Panel A reports main regression results. Column 1 presents results from baseline specification. Column 2-3 include board diversity measures into baseline regression and column 4 includes measures for differences in director experience. Panel B disentangles the variations in board tenure that are due to board compositional change vis-à-vis those that are due to passage of time. 'D (Turnover)' is a dummy equal to one if there are changes to board compositions. 'D (No Turnover)' is a dummy equal to one if there are no changes to board composition. I measure diversity in gender, ethnicity, and age using the Blau Index, calculated as $1-\sum_{i=1}^{s} p_i^2$, where s is the number of categories and p is the fraction of directors belonging to category i. Ethnicity is measured over five groups: Caucasian, Indian American, Asian, Hispanic, Black, and Other. Gender is measured over two groups: female and male. Age is measured in terms of birth cohorts, which are ten-year periods starting from 1930, 1940, 1950, 1960, and 1970. All the other variables are defined under Table 1. Constants are included in the regressions but not displayed here. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

Panel A Main Results

	(1) Baseline	(2) Diversity 1	(3) Diversity 2
Board tenure	0.0145	0.0183	0.0190
	(1.876)*	(2.307)**	(2.501)**
Board tenure squared	-0.00080	-0.0010	-0.0010
	(-2.236)**	(-2.399)**	(-2.561)**
Std dev of board tenure		-0.008	-0.007
		(-2.130)**	(-1.813)*
Blau index of gender			-0.090
			(-1.153)
Blau index of ethnicity			0.026
			(0.656)
Blau index of age cohort			-0.223
			(-2.961)***
Insider tenure	-0.003	-0.002	-0.002
	(-1.860)*	(-1.383)	(-1.548)
CEO age	0.000	0.000	-0.000
	(0.202)	(0.209)	(-0.349)
CEO ownership >20%	0.093	0.092	0.092
	(1.801)*	(1.780)*	(1.778)*
CEO-Chair	0.016	0.014	0.015
	(0.959)	(0.804)	(0.888)
Classified board	0.128	0.126	0.129
	(3.858)***	(3.810)***	(3.890)***
Independent board	-0.033	-0.031	-0.030
	(-1.565)	(-1.458)	(-1.442)
Busy Board	-0.014	-0.015	-0.022
	(-0.530)	(-0.596)	(-0.834)
Blockholder on board	0.011	0.014	0.015
	(0.420)	(0.554)	(0.576)
Interlocked Board	-0.098	-0.099	-0.102
	(-2.948)***	(-2.970)***	(-3.066)***
Board size	-0.027	-0.025	-0.022
	(-5.405)***	(-4.893)***	(-4.321)***
Firm age	-0.260	-0.256	-0.258
	(-3.688)***	(-3.569)***	(-3.616)***
Complex firm	-0.089	-0.087	-0.087
	(-3.915)***	(-3.857)***	(-3.828)***
Ln(1+ROA)	0.677	0.670	0.668
	(4.349)***	(4.253)***	(4.232)***
Growth opportunities	2.094	2.084	2.069
	(4.418)***	(4.347)***	(4.235)***
Risk	0.131	0.130	0.129
	(5.345)***	(5.318)***	(5.262)***
Observations	13,989	13,989	13,989
R-squared	0.737	0.737	0.737
Firm fixed effect	Yes	Yes	Yes

Panel B Compositional Effect Vs Time Effect

	(4) Tobin
Board tenure*D(Turnover)	0.0193
	(2.181)**
Board tenure squared*D(Turnover)	-0.0011
	(-2.441)**
Board tenure*D(No turnover)	0.0154
	(1.991)**
Board tenure squared*D(No turnover)	-0.0008
	(-2.201)**
Insider tenure	-0.003
	(-1.844)*
CEO age	0.000
	(0.004)
CEO ownership >20%	0.094
	(1.813)*
CEO-Chair	0.016
	(0.961)
Classified board	0.127
	(3.849)***
Independent board	-0.033
	(-1.568)
Busy Board	-0.013
	(-0.509)
Blockholder on board	0.011
	(0.439)
Interlocked Board	-0.098
	(-2.950)***
Board size	-0.027
	(-5.390)***
Firm age	-0.261
	(-3.706)***
Complex firm	-0.089
	(-3.924)***
Ln(1+ROA)	0.678
	(4.357)***
Growth opportunities	2.094
	(4.416)***
Risk	0.131
	(5.354)***
Observations	13,989
R-squared	0.737
Firm fixed effect	Yes
Year fixed effect	Yes

Year fixed effect	Yes	Yes	Yes

Table 3 Event Study – T test

The table reports three-day announcement return on a sample of non-executive directors who died suddenly between 1994 and 2011. The sample of sudden deaths is compiled from various sources. I manually searched Factiva, Edgar 8-K filings, and Google by keywords on director (e.g., "director", "board") and death ("passed away", "deceased", etc.) over the period 1994 to 2011. I then read news articles and online filings to determine the cause of death. This process resulted in the identification 151 deaths of outside directors that were 'sudden deaths', where I define sudden deaths following Nguyen and Nielsen (2011), after excluding concurrent confounding events such as merger and acquisition announcements and quarterly earnings announcements. CAR [-1, 1] is three-day announcement returns using market model with an value-weighted market index, where event day 0 is when the death is first reported in the news. Model parameters are estimated from day -11 for 200 days. Panel A tabulates the different causes of sudden deaths in the sample. Panel B reports results on the announcement return depending on the direction of movement of board tenure. 'Move away from the optimal' is a dummy variable equal to one if the sudden death of a director results in board tenure of remaining directors moving away from nine years. 'Move closer towards the optimal' is a dummy variable equal to one if the sudden death of a director results in board tenure of remaining directors moving closer towards nine years. The choice of nine years as the cutoff is based on regression results in Table 2. Panel C and Panel D reports announcement return conditional on the board tenure prior to the death of the director. Panel E reports the announcement returns on a subsample where replacement or non-replacement will not affect direction of movement in board tenure. ***, **,* denote significance at 1%, 5% and 10% level.

Panel A Causes of sudden deaths			
Cause of death	N	%	
Accidents	13	8.61	
Heart attack	46	30.46	
Murder	1	0.66	
Stroke	11	7.28	
Sudden death undisclosed causes	55	36.42	
Acute illness	18	11.92	
Suicide	7	4.64	
Total	151	100	
Panel B Shock to board tenure following sudden deaths of directors			
CAR[-1,1]	Move away from the optimal	Move closer towards the optimal	Test of mean (median) difference
N	73	78	
Mean	-1.429%	1.038%	
t-stat	(-3.526)***	(2.556)***	4.324***
Median	-0.926%	0.442%	
Wilcoxon z-stat	(-3.081)***	(2.194)**	3.694***
Panel C Board tenure below the optimal before the death			
	Board tenure increases but remains below the optimal	Board tenure increases and above the optimal	Board tenure decreases but remains below the optimal
N	52	3	47
Mean	1.079%	-4.899%	-0.941%
t-stat	(2.054)**	(-5.189)***	(-1.896)*
Panel D Board tenure above the optimal before the death			
	Board tenure increases and above the optimal	Board tenure decreases but remain above the optimal	Board tenure decreases and below the optimal
N	20	23	6
Mean	-1.58%	1.25%	-2.95%
t-stat	(-2.813)***	(1.875)*	(-1.100)
Panel E Board tenure moves in the same direction with or without replacement			
	Move away from the optimal	Move closer towards the optimal	Test of mean difference
N	58	19	
Mean	-1.473%	1.515%	
t-stat	(-2.995)***	(1.915)*	2.913**

Table 4 Event Study-Regression

The table reports four-day announcement return on a sample of independent directors who died suddenly between 1994 and 2011. Following Nguyen and Nielsen (2011), the death of director is sudden if the death is unanticipated. CAR [-1, 1] is the three-day announcement returns using market adjusted model with an value-weighted market index, where event day 0 is when the death is first reported in the news. Model parameters are estimated from day -11 for 200 days. 'Move away from the optimal' is a dummy equal to one if sudden death of a director results in board tenure moving away from nine years. 'Audit committee' is a dummy equal to one if the dead director sits on the audit committee. 'Compensation committee' is a dummy equal to one if the dead director sits on the Compensation committee. 'Nomination committee' is a dummy equal to one if the dead director sits on the nomination committee. Constants are included in the regressions but not displayed here. Industry fixed effect is at Fama French's 10 industries level. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are clustered at director level.

	(1) All Sample	(2) Same Direction Sample
Move away from the optimal	-0.025	-0.036
	(-4.130)***	(-2.103)**
Audit committee	0.004	0.006
	(0.568)	(0.661)
Compensation committee	-0.001	-0.004
	(-0.212)	(-0.449)
Nomination committee	0.009	0.008
	(1.518)	(0.893)
Independent board	-0.008	0.002
	(-0.327)	(0.084)
Board size	0.011	0.031
	(0.948)	(1.873)*
Director tenure	0.000	-0.001
	(0.020)	(-0.926)
Director age	0.000	0.001
	(0.330)	(1.537)
CEO-Chair	-0.007	-0.009
	(-1.165)	(-1.204)
Log of asset	0.001	-0.001
	(0.465)	(-0.477)
Market-to-book ratio	-0.002	-0.003
	(-3.859)***	(-7.721)***
Firm age	-0.006	-0.003
	(-1.761)*	(-0.595)
Constant	0.001	-0.069
	(0.015)	(-1.032)
Observations	150	75
R-squared	0.232	0.394
Industry FE	Yes	Yes
Year FE	Yes	Yes

Table 5 Underlying Mechanisms

The sample period is from 1998 to 2010. Dependent variable is Tobin's Q and is truncated at top and bottom 1 percentile. Column 1-3 split the sample by the complexity of the firm. Column 4-6 split the sample by intangibility of asset, measured by R&D intensity. Column7-9 split the sample by the dynamism of the industry. Column10-11 splits the sample by whether firms experience CEO retirement or deaths during the sample period. Dynamic industry dummy is one if the firm is identified as an internet stock by Ritter and Loughran (2004) or the firm belongs to technology sector. (Sic code 3571, 3572, 3575, 3577, 3578, 3661, 3663, 3669, 3671, 3672, 3674, 3675, 3677, 3678, 3679, 3812, 3823, 3825, 3826, 3827, 3829, 3841, 3845, 4812, 4813, 4899, 7371, 7372, 7373, 7374, 7375, 7378, 7379). R&D intensive is one if R&D total asset ratio is above median for that year. All the other variables are defined under Table 1. Constants are included in the regressions but not displayed here. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

Panel A Knowledge

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Complex firms	Non-complex firms		R&D Intensive	R&D non-Intensive		Non-Dynamic Industry	Dynamic Industry	
Board tenure	0.0269	0.0095	-0.0109	0.025	0.003	-0.005	0.0261	-0.0424	-0.0187
	(2.803)***	(0.754)	(-2.295)**	(1.809)*	(0.406)	(-1.657)*	(3.352)***	(-1.958)*	(-2.187)**
Board tenure squared	-0.0012	-0.0007		-0.0012	-0.000		-0.0013	0.0015	
	(-2.512)**	(-1.273)		(-1.896)*	(-1.062)		(-3.507)***	(1.526)	
Insider tenure	-0.003	-0.004	-0.005	-0.002	-0.003	-0.003	-0.002	-0.003	-0.005
	(-2.047)**	(-1.523)	(-2.000)**	(-0.865)	(-1.836)*	(-1.803)*	(-1.472)	(-0.670)	(-1.094)
CEO age	0.000	0.002	0.002	-0.004	0.003	0.003	-0.001	0.004	0.004
	(0.009)	(0.671)	(0.661)	(-1.639)	(1.916)*	(1.905)*	(-0.669)	(0.993)	(0.994)
CEO ownership >20%	-0.018	0.075	0.085	0.109	0.039	0.038	0.164	-0.308	-0.301
	(-0.275)	(0.953)	(1.073)	(1.011)	(0.755)	(0.737)	(3.191)***	(-2.014)**	(-1.963)**
CEO-Chair	0.007	0.033	0.041	0.037	0.015	0.016	0.015	0.003	0.008
	(0.400)	(1.107)	(1.366)	(1.272)	(0.811)	(0.862)	(0.931)	(0.062)	(0.144)
Classified board	0.175	0.043	0.045	0.220	0.079	0.080	0.131	0.090	0.029
	(5.600)***	(0.574)	(0.601)	(3.565)***	(2.231)**	(2.235)**	(4.117)***	(0.783)	(0.255)
Independent board	-0.011	-0.057	-0.066	-0.084	-0.013	-0.013	-0.040	0.029	0.010
	(-0.427)	(-1.661)*	(-1.924)*	(-2.186)**	(-0.589)	(-0.574)	(-1.936)*	(0.454)	(0.158)
Busy Board	-0.006	-0.026	-0.035	-0.048	0.014	0.014	0.003	-0.101	-0.093
	(-0.248)	(-0.413)	(-0.568)	(-1.260)	(0.407)	(0.412)	(0.122)	(-1.379)	(-1.269)
Blockholder on board	0.021	-0.003	0.007	0.068	-0.001	-0.003	0.005	0.034	0.037
	(0.729)	(-0.060)	(0.150)	(1.455)	(-0.048)	(-0.115)	(0.215)	(0.404)	(0.436)
Interlocked board	-0.094	-0.084	-0.090	-0.170	-0.076	-0.075	-0.052	-0.372	-0.379
	(-2.941)***	(-1.177)	(-1.258)	(-2.913)***	(-2.054)**	(-2.030)**	(-1.654)*	(-2.975)***	(-3.017)***
Board size	-0.005	-0.062	-0.069	-0.037	-0.016	-0.016	-0.022	-0.034	-0.037
	(-0.962)	(-6.254)***	(-6.963)***	(-4.081)***	(-2.990)***	(-2.979)***	(-4.614)***	(-2.059)**	(-2.221)**
Firm age	-0.075	-0.459	-0.025	-0.175	-0.294	-0.290	-0.186	-0.450	-0.015
	(-1.940)*	(-4.851)***	(-1.084)	(-2.107)**	(-4.628)***	(-4.559)***	(-4.936)***	(-3.483)***	(-0.887)
Complex firm				-0.087	-0.102	-0.102	-0.118	0.017	0.006
				(-2.264)**	(-3.981)***	(-3.999)***	(-5.321)***	(0.248)	(0.094)
Ln(1+ROA)	0.500	0.468	0.524	0.529	0.775	0.776	0.478	0.900	0.985
	(4.264)***	(4.012)***	(4.504)***	(4.339)***	(4.270)***	(4.286)***	(5.670)***	(4.204)***	(4.632)***
Growth opportunities	2.278	1.696	1.741	3.624	1.466	1.464	1.761	2.596	2.673
	(4.034)***	(4.725)***	(4.918)***	(4.291)***	(4.321)***	(4.310)***	(4.619)***	(5.023)***	(5.162)***

Panel B CEO-Board Interaction

	(10)	(11)
	CEO Death/ Retirement	No change in CEO
Board tenure	0.030	0.0281
	(2.767)***	(1.739)*
Board tenure squared	-0.0013	-0.0015
	(-1.891)*	(-2.217)**
Insider tenure	-0.001	-0.000
	(-0.424)	(-0.034)
CEO age	0.003	-0.016
	(1.366)	(-1.851)*
CEO ownership >20%	0.061	0.027
	(0.766)	(0.294)
CEO-Chair	0.033	-0.047
	(1.197)	(-1.088)
Classified board	0.178	0.158
	(3.310)***	(2.198)**
Independent board	-0.020	0.032
	(-0.580)	(0.789)
Busy Board	0.038	-0.013
	(1.032)	(-0.208)
Blockholder on board	0.032	-0.013
	(0.805)	(-0.254)
Interlocked Board	-0.083	-0.168
	(-1.575)	(-2.428)**
Board size	-0.034	-0.019
	(-4.366)***	(-1.669)*
Firm age	-0.168	-0.319
	(-3.024)***	(-3.693)***
Complex firm	-0.015	-0.080
	(-0.392)	(-1.779)*
Ln(1+ROA)	0.882	0.635
	(6.205)***	(4.052)***
Growth opportunities	1.695	1.419
	(6.837)***	(5.119)***

Risk	0.143	0.051	0.078	0.190	0.051	0.050	0.122	-0.059	-0.027
	(5.157)***	(1.183)	(1.831)*	(4.500)***	(1.811)*	(1.775)*	(4.990)***	(-0.694)	(-0.317)
Observations	7,077	6,912	6,912	6,496	7,493	7,493	11,298	2,691	2,691
R-squared	0.757	0.741	0.740	0.708	0.769	0.769	0.764	0.668	0.666
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Risk	0.265	0.024
	(6.777)***	(0.478)
Observations	4,016	4,313
R-squared	0.770	0.759
Firm fixed effect	Yes	Yes
Year fixed effect	Yes	Yes

Table 6 Alternative Mechanisms

The sample period is from 1998 to 2010. Dependent variable is Tobin's Q and is truncated at top and bottom 1 percentile. CEO ownership data is from Execucomp and director ownership data is from IRRC. 'CEO equity ownership' is the percentage of common stocks owned by a CEO. 'Director equity ownership' is the percentage of common stock owned by all outside directors. '% Retirement age directors' is the percentage of outside directors that are above retirement age of 70. 'Avg age of directors' is the average age of all outside directors. All the other variables are defined under Table 1. Constants are included in the regressions but not displayed here. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

	(1) Explicit Incentives	(2) Implicit Incentives	(3) All Incentives
Board tenure	0.0149	0.021	0.02
	(1.931)*	(2.656)***	(2.748)***
Board tenure squared	-0.0008	-0.001	-0.001
	(-2.283)**	(-2.260)**	(-2.324)**
Insider tenure	-0.003	-0.002	-0.002
	(-1.984)**	(-1.593)	(-1.692)*
CEO equity ownership	0.011		0.011
	(3.289)***		(3.380)***
CEO equity ownership squared	-0.000		-0.000
	(-2.711)***		(-2.784)***
Director equity ownership	0.005		0.002
	(0.408)		(0.188)
Director equity ownership squared	0.000		0.000
	(0.559)		(0.730)
% Retirement age directors		-0.123	-0.124
		(-1.749)*	(-1.764)*
Avg age of directors		-0.007	-0.008
		(-2.334)**	(-2.380)**
CEO age	-0.000	0.000	-0.000
	(-0.362)	(0.154)	(-0.292)
CEO-Chair	0.012	0.016	0.009
	(0.681)	(0.966)	(0.551)
Classified board	0.126	0.126	0.126
	(3.822)***	(3.801)***	(3.809)***
Independent board	-0.029	-0.032	-0.025
	(-1.362)	(-1.505)	(-1.202)
Busy Board	-0.012	-0.012	-0.011
	(-0.474)	(-0.481)	(-0.436)
Blockholder on board	-0.005	-0.000	-0.008
	(-0.145)	(-0.009)	(-0.234)
Interlocked board	-0.099	-0.100	-0.102
	(-2.982)***	(-3.006)***	(-3.054)***
Board size	-0.026	-0.026	-0.025
	(-5.230)***	(-5.104)***	(-4.910)***
Firm age	-0.258	-0.263	-0.260
	(-6.639)***	(-6.764)***	(-6.672)***
Complex firm	-0.087	-0.087	-0.085
	(-3.836)***	(-3.857)***	(-3.764)***
Ln(1+ROA)	0.675	0.671	0.669
	(8.333)***	(8.280)***	(8.248)***
Growth opportunities	2.083	2.096	2.078
	(14.338)***	(14.442)***	(14.312)***
Risk	0.130	0.130	0.128
	(5.303)***	(5.305)***	(5.257)***
Observations	13,989	13,989	13,989
R-squared	0.737	0.737	0.737
Firm fixed effect	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes

Table 7 M&A Announcement Return

The sample consists of completed US mergers and acquisitions (listed in SDC) between 1998 and 2006. Following Masulis, Wang, and Xie (2007), sample includes acquisitions that meet following criteria: 1) The acquisition is complete, 2) The acquirer controls less than 50% of the target's shares prior to the announcement and owns 100% of the target's share after the transaction, 3) The deal value disclosed in SDC is more than $1 million, 4) the acquirer has annual financial information from Compustat and CRSP, 5) the acquirer is included in IRRC database with valid Gomper et al (2003) index and board tenure information. 'CAR[-2,2] (CAR[0,1])' is 5-day (2-day) announcement return using CRSP value-weighted market return and estimate market model parameters over the 200-day period from event day -210 to event day -11. 'D(Neg AR)' is a dummy equal to one if CAR[-2,2] is negative. 'Target public' dummy is one if the target is a public firm. 'All Cash deal' dummy is one if acquisition is financed by 100% cash. 'Deal size' is the deal value from SDC over market value of equity at last fiscal year end. 'Diversifying Acq' is a dummy equal to one if acquirer and target are not in the same industry at Fama-French 48 industry level. All the firm level controls are at the most recent fiscal year end prior to the acquisition announcement. 'Free cash flow' is operating income before depreciation (item # 13) minus interest expense (item # 15) minus income taxes (item # 16) minus capital expenditures (item # 128), scaled by book value of total assets (item # 6). 'Leverage' is book value of debt (item # 34+item # 9) over book value of total assets (item # 6). Year fixed effects and industry fixed effects at Fama-French 48 industry levels are included in all regressions. All other variables are defined under Table 1. Constants are included in the regressions but not displayed here. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

	(1) CAR[0,1]	(2) CAR[-2,2]	(3) D(Neg AR)
Board tenure	0.001	0.0024	-0.088
	(1.687)*	(1.996)**	(-2.165)**
Board tenure squared	-0.00007	-0.0001	0.004
	(-1.828)*	(-1.715)*	(2.310)**
G index	-0.001	-0.001	0.032
	(-1.886)*	(-2.164)**	(1.977)**
Insider tenure	0.000	0.000	-0.009
	(3.196)***	(1.778)*	(-1.306)
CEO age	-0.000	-0.000	0.016
	(-2.652)***	(-1.627)	(2.535)**
Busy Board	-0.006	-0.007	0.269
	(-2.623)***	(-2.022)**	(2.403)**
Independent board	0.003	0.002	-0.013
	(0.925)	(0.571)	(-0.093)
Board size	0.000	0.000	-0.009
	(0.634)	(0.765)	(-0.477)
CEO-Chair	0.002	0.004	-0.098
	(1.299)	(1.424)	(-1.079)
Target public	-0.013	-0.013	0.294
	(-5.733)***	(-3.899)***	(2.760)***
All Cash deal	0.003	0.005	-0.138
	(1.681)*	(2.116)**	(-1.640)
Deal size	-0.018	-0.015	0.365
	(-4.589)***	(-2.549)**	(1.848)*
Diversifying Acq	-0.003	-0.002	-0.043
	(-1.609)	(-0.602)	(-0.484)
Firm age	0.000	-0.000	0.002
	(0.249)	(-0.261)	(0.713)
Risk	-0.013	-0.073	0.877
	(-0.636)	(-2.504)**	(0.922)
Free cash flow	0.007	-0.043	0.163
	(0.623)	(-2.552)**	(0.297)
Leverage	0.009	0.003	-0.011
	(1.403)	(0.326)	(-0.034)
Log of asset	-0.001	-0.002	0.022
	(-1.159)	(-1.663)*	(0.622)
Tobin	-0.001	-0.001	0.002
	(-1.917)*	(-1.426)	(0.123)
Observations	2,696	2,696	2,688
R-squared	0.071	0.055	0.0290
Year FE	Yes	Yes	Yes
FF48 FE	Yes	Yes	Yes

Table 8 Financial Reporting Quality

The sample period is from 1998 to 2010. 'AQ' is the discretionary accruals estimated using the Dechow and Dechiv (2002) model augmented by the fundamental variables in the Jones (1991) model as suggested by McNichols (2002). The model is a regression of working capital accruals on current, future and past cash flows plus the change in revenue and PPE. I estimate Dechow and Dechiv model cross-sectional for each industry with at least 20 observations in a given year based on Fama-French 48 industry classification. AQ at year t is defined as the standard deviation of the firm-level residuals from the Dechow and Dechiv model during the years t-5 to t-1. I multiply the standard deviation by negative one so that AQ is increasing in financial reporting quality. 'FOG' is the FOG index based on Li (2008). The FOG index is available from Li's website and I multiply it by negative one so that it is increasing in reporting quality. CScore is constructed based on Basu's (1997) model as follows： $X_i = \beta_1 + \beta_2 D_i + \beta_3 R_i + \beta_4 D_i * R_i + e_i$, Where X is earnings over the market value of equity at the prior fiscal year end, R is the annual stock return, D is a dummy variable that is equal to one if R < 0 and zero otherwise. β_4 measures the incremental timeliness for bad news over good news, namely, accounting conservatism. Khan and Watts (2009) assume that both β_3 and β_4 are linear functions of firm-specific characteristics each year. $\beta_3 = \mu_1 + \mu_2 Size_i + \mu_3 MB_i + \mu_4 Lev_i$ and $CScore = \beta_4 = \lambda_1 + \lambda_2 Size_i + \lambda_3 MB_i + \lambda_4 Lev_i$, Where Size is the log of the market value of equity, MB is the ratio of market value of equity to book value of equity, and Lev is total debt divided by the market value of equity. Thus, the annual cross-sectional regression model used to estimate CScore can be written as $X_i = \beta_1 + \beta_2 D_i + R_i(\mu_1 + \mu_2 Size_i + \mu_3 MB_i + \mu_4 Lev_i) + D_i R_i(\lambda_1 + \lambda_2 Size_i + \lambda_3 MB_i + \lambda_4 Lev_i) + (\delta_1 Size_i + \delta_2 MB_i + \delta_3 Lev_i + \delta_4 D_i Size_i + \delta_5 D_i MB_i + \delta_6 D_i Lev_i) + \varepsilon_i$, Where coefficients δ_1- δ_6 capture the independent effects of firm specific variables and their interactions with D on earnings, while coefficients λ_1 - λ_4 are used to construct CScore. I estimate above equation cross-sectionally for each industry with at least 20 observations in a given year based on Fama-French 48 industry classification. 'FRQ' is a continuous variable computed as the standardized average of AQ, FOG and CScore. 'Tangibility' is the ratio of PPE (item #8) to total assets (item #6). 'Zscore' is the Altman's Z score and is constructed as 3.3*EBIT (item # 170) +Sales (item # 12) +0.25* Retained earnings (Item # 36) +0.5* working capital (item #4 –item # 5), all scaled by total assets (item #6). 'Dividend paying' is a dummy equal to one if firm paid a dividend (i.e if item #21>0 or item # 127>0), and zero otherwise. All the other variables are defined under Table 1. Constants are included in the regressions but not displayed here. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

	(1) AQ	(2) FOG	(3) CSCORE	(4) FRQ
Board tenure	0.0027	0.0703	0.0168	0.0032
	(1.890)*	(2.373)**	(2.497)**	(3.327)***
Board tenure squared	-0.0001	-0.0031	-0.0008	-0.0002
	(-2.168)**	(-2.265)**	(-2.448)**	(-3.445)***
Insider tenure	-0.001	-0.007	0.000	-0.000
	(-2.102)**	(-1.321)	(0.159)	(-1.539)
CEO age	0.000	-0.005	-0.000	-0.000
	(0.487)	(-1.004)	(-0.210)	(-0.529)
CEO ownership >20%	0.023	0.085	-0.021	0.014
	(2.187)**	(0.388)	(-0.431)	(1.982)**
CEO-Chair	0.004	0.016	-0.030	-0.002
	(1.350)	(0.254)	(-2.087)**	(-0.982)
Classified board	0.008	0.133	0.038	0.008
	(1.330)	(1.005)	(1.278)	(1.739)*
Independent board	0.000	0.185	0.009	0.000
	(0.049)	(2.342)**	(0.490)	(0.117)
Busy Board	0.011	0.066	0.004	0.006
	(2.408)**	(0.669)	(0.172)	(2.005)**
Blockholder on board	0.005	-0.119	0.014	0.002
	(1.095)	(-1.168)	(0.605)	(0.636)
Interlocked board	-0.020	0.315	-0.023	-0.004
	(-3.119)***	(2.396)**	(-0.769)	(-0.907)
Board size	0.002	-0.020	0.001	0.000
	(1.855)*	(-1.054)	(0.286)	(0.503)
Firm age	-0.000	0.050	0.001	0.001
	(-0.039)	(3.225)***	(0.416)	(1.474)
Complex firm	-0.009	-0.049	0.006	-0.003
	(-2.277)**	(-0.570)	(0.330)	(-1.064)
Ln(1+ROA)	0.077	0.042	0.095	0.035
	(5.188)***	(0.137)	(1.354)	(3.453)***
Growth opportunities	-0.049	-0.330	-0.116	-0.042
	(-1.843)*	(-0.595)	(-0.925)	(-2.330)**
Risk	-0.027	0.062	0.127	-0.000
	(-5.824)***	(0.656)	(5.881)***	(-0.024)

Tangibility	-0.028	0.170	0.141	0.011
	(-1.322)	(0.389)	(1.430)	(0.795)
Dividend paying	-0.007	-0.012	0.016	-0.002
	(-1.464)	(-0.113)	(0.678)	(-0.470)
Zscore	-0.007	0.142	0.018	0.002
	(-2.868)***	(2.855)***	(1.580)	(1.070)
Observations	9,337	9,337	9,337	9,337
R-squared	0.694	0.426	0.214	0.640
Firm fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes

Table 9 Option Backdating

The director and CEO option lucky grants are from Bebchuk, Grinstein and Peyer (2010). The sample period is from 1998 to 2006. Data on executive lucky grants are available from Lucian Bebchuk's website. The dependent variable is a lucky dummy equal to one if the firm granted its CEO (director) a lucky option grant during the year, and zero otherwise. The option grant is a lucky grant if the exercise price of the grant coincides with the lowest share price of the month. All the other variables are defined under Table 1. Constants are included in the regressions but not displayed here. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

	(1)	(2)
	D(Director luck)	D(CEO luck)
Board tenure	-0.092	0.008
	(-2.001)**	(0.134)
Board tenure squared	0.003	-0.001
	(1.819)*	(-0.408)
Insider board tenure	0.008	0.000
	(0.847)	(0.038)
CEO age	-0.001	0.003
	(-0.188)	(0.370)
CEO ownership >20%	-0.121	-0.541
	(-0.358)	(-1.282)
CEO-Chair	-0.004	-0.073
	(-0.030)	(-0.568)
Classified board	-0.111	-0.123
	(-0.879)	(-0.976)
Independent board	-0.265	-0.244
	(-1.810)*	(-1.552)
Busy Board	-0.419	-0.240
	(-1.716)*	(-1.018)
Blockholder on board	-0.511	-0.498
	(-2.654)***	(-2.496)**
Interlocked board	0.179	-0.026
	(0.779)	(-0.098)
Board size	0.008	0.031
	(0.263)	(0.953)
Lagged tobin	0.056	0.026
	(1.017)	(0.461)
Firm age	-0.007	-0.018
	(-1.546)	(-4.402)***
Complex firm	0.069	0.101
	(0.461)	(0.701)
Ln(1+ROA)	1.453	0.484
	(2.665)***	(0.947)
Growth opportunities	-3.430	-1.274
	(-2.904)***	(-1.218)
Risk	0.559	0.646
	(3.207)***	(3.628)***
Received Lucky grant last year	1.178	0.995
	(6.174)***	(5.452)***
Observations	8,038	8,038
R-squared	0.0652	0.0659
Year fixed effect	Yes	Yes

Table 10 Strategic Persistence

Strategic persistence measure is constructed following Finkelstein and Hambrick (1990). In particular, I use six strategic indicators are used to create composite measure of persistence: 1) R&D intensity (item #46 over item #12), 2) PPE newness (item #8 over item #7), 3) advertising intensity (item #45 over item #12), 4)nonproduction overhead (item #132 over item #12), 5) inventory level (item #3 over item #12), 6) financial leverage (sum of item #9 and item #34 over item #60). The composite persistence measures are calculated as follows: treating t as the focal year, I compute the firm's five-year (t-2 through t+2) variance for each strategic dimension. Next, I standardize variance scores for each dimension by subtracting the minimum and scaling by the range of the variance at the three-digit SIC level. I then multiply each standardized value by minus one (-1) to bring the measures in line with the concept of persistence (i.e., an absence of strategic variance over time). The composite measure is the sum of all six dimensions. Missing R&D (advertising) information is replaced by zero and a RD (advertising) missing dummy takes value of one if the value is missing in the original data. All the other variables are defined under Table 1. Constants, R&D (advertising) missing dummy are included in the regressions but not displayed here. Column 2 reports the likelihood of filing a patent. Number of patent filings is extracted from NBER patent database for the 1998-2006 period. The dependent variable is a dummy equal to one if a company files for a patent during a year. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

	(1) Persistence	(2) Likelihood of patent filing	(3) Likelihood of patent citation
Board tenure	-0.0085	0.041	0.051
	(-1.802)*	(1.733)*	(1.911)*
Board tenure squared	0.0004	-0.002	-0.002
	(1.871)*	(-1.734)*	(-1.661)*
Insider tenure	0.002	-0.015	-0.017
	(2.185)**	(-3.654)***	(-3.701)***
CEO age	0.000	0.012	0.011
	(0.032)	(3.295)***	(2.563)**
CEO ownership >20%	0.024	0.056	-0.049
	(0.668)	(0.383)	(-0.302)
CEO-Chair	-0.006	-0.041	-0.042
	(-0.626)	(-0.723)	(-0.661)
Classified board	-0.025	-0.002	-0.030
	(-1.155)	(-0.035)	(-0.512)
Independent board	0.019	0.353	0.352
	(1.456)	(5.131)***	(4.720)***
Busy Board	0.009	0.846	0.812
	(0.536)	(9.395)***	(8.593)***
Blockholder on board	0.035	-0.244	-0.271
	(2.033)**	(-2.945)***	(-2.941)***
Interlocked board	-0.002	0.286	0.307
	(-0.089)	(2.895)***	(2.923)***
Board size	0.004	0.010	0.014
	(1.114)	(0.879)	(1.156)
Lagged tobin	0.001	0.150	0.171
	(0.279)	(8.017)***	(9.005)***
Firm age	-0.004	0.021	0.022
	(-0.941)	(13.036)***	(11.963)***
Complex firm	-0.045	0.479	0.331
	(-3.098)***	(7.682)***	(4.778)***
Ln(1+ROA)	0.107	-0.088	0.119
	(2.024)**	(-0.331)	(0.442)
R&D/Sale	-0.326	1.021	0.234
	(-3.651)***	(4.352)***	(1.753)*
Risk	-0.073	0.423	0.480
	(-4.888)***	(5.038)***	(5.228)***
Observations	14,699	10,853	10,853
R-squared	0.672	0.285	0.340
Firm fixed effect	Yes	No	No
Year fixed effect	Yes	Yes	Yes

Table 11 CEO Replacement

The sample period is from 1998 to 2009. CEO replacements are identified from the Execucomp database, where a CEO is taken to be replaced if for firm i the CEO in year t is different from the CEO in year t+1. A CEO replacement is considered as a forced replacement if the departing CEO is below retirement age of 62. 'CEO Turnover' is a dummy equal to one if a CEO is replaced. 'Forced Turnover' is a dummy equal to one if a replacement is a forced replacement. All the independent variables are measured at last fiscal year prior to the replacement. 'D(board tenure<8)' is a dummy equal to one if board tenure is less than 8 years. 'D(8<=board tenure<=10)' is a dummy equal to one if board tenure is between 8 and 10 years. 'D(board tenure>=11)' is a dummy equal to one if board tenure is above 11 years. The choice of board tenure cutoffs are based on regression results in Table 2. `Stock return' is the stock return over last fiscal year. 'Firm-specific return' is the difference between overall stock return and market return, where 'market return' is return from value-weighted market index. 'Risk(idiosyncratic)' is the standard deviation of idiosyncratic portion of stock return. Specifically, I run following firm-specific regressions of daily stock return: $R_{i,t} = \beta_0 + \beta_{i,t} MKT_t + \varepsilon_{i,t}$, where $R_{i,t}$ is the daily stock returns of stock i in year t and MKT_t is value-weighted index return in year t. I require firm to have at least 60 daily stock returns in a year to be included in the sample. The standard deviation of predicted value from this regression, $\hat{\beta}_0 + \hat{\beta}_{i,t} MKT_t$, is a measure of systematic exposure to the market or 'Risk(systematic)'. 'Risk(idiosyncratic)' is the standard deviation of residual returns from that regression. All the other variables are defined under Table 1. Constants are included in the regressions but not displayed here. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

	(1) CEO Turnover	(2) CEO Turnover	(3) Forced CEO Turnover	(4) Vol CEO Turnover	(5) CEO Turnover
Stock return	-0.395				
	(-4.876)***				
Stock return*D(Board tenure<8)		-0.280	-0.306	-0.103	
		(-2.702)***	(-2.472)**	(-0.583)	
Stock return*D(8<=Board tenure<=10)		-0.614	-0.831	-0.197	
		(-4.140)***	(-4.624)***	(-0.799)	
Stock return*D(Board tenure>=11)		0.360	-1.236	2.212	
		(0.249)	(-0.488)	(1.200)	
Firm-specific return*D(Board tenure<8)					-0.233
					(-2.225)**
Firm-specific return*D(8<=Board tenure<=10)					-0.472
					(-3.302)***
Firm-specific return*D(Board tenure>=11)					0.363
					(0.287)
Market return*D(Board tenure<8)					-0.551
					(-1.682)*
Market return*D(8<=Board tenure<=10)					-1.092
					(-2.764)***
Market return*D(Board tenure>=11)					1.118
					(0.398)
D(Board tenure<8)		0.292	0.448	0.150	0.299
		(3.086)***	(3.250)***	(1.085)	(3.121)***
D(8<=Board tenure<=10)		0.133	0.295	0.063	0.147
		(1.303)	(1.963)**	(0.431)	(1.415)
Ln(1+ROA)	-0.610	-0.694	-1.029	0.111	-0.745
	(-1.778)*	(-1.993)**	(-2.523)**	(0.189)	(-2.149)**
CEO age	0.097	0.099	-0.005	0.212	0.099
	(19.432)***	(19.361)***	(-0.801)	(24.835)***	(19.365)***
CEO tenure	-0.018	-0.013	-0.016	-0.026	-0.013
	(-3.765)***	(-2.678)***	(-2.376)**	(-3.636)***	(-2.722)***
CEO ownership >20%	-0.967	-0.927	-0.246	-2.268	-0.929
	(-4.213)***	(-4.024)***	(-0.780)	(-6.114)***	(-4.030)***
CEO-Chair	0.143	0.122	0.112	0.283	0.123
	(1.609)	(1.596)	(1.166)	(2.188)**	(1.606)
Risk(idiosyncratic)	0.323	0.268	0.362	-0.135	0.272
	(3.600)***	(2.904)***	(2.996)***	(-0.937)	(2.953)***
Risk(systematic)	-0.719	-0.803	-1.260	0.218	-0.715
	(-1.972)**	(-2.204)**	(-2.928)***	(0.349)	(-1.927)*
Observations	12,519	12,519	12,519	12,519	12,519
R-squared	0.0718	0.0738	0.0292	0.0249	0.0737
Year fixed effect	Yes	Yes	Yes	Yes	Yes

Table 12 Robustness Tests

The sample period is from 1998 to 2010. Dependent variable is tobin's Q and is truncated at top and bottom 1 percentile. Unless otherwise stated, the regressions contain same set of control variables as in Table 2 Column 1. Panel A includes insider tenure squared into the regression specification. Panel B uses average tenure of all directors on board and its square in the regression. Panel C excludes regulated industries (sic 4000-4999 and 6000-6999). Panel D excludes those firm-year observations for which adjustments to tenure have been made. Panel E truncates board tenure at 1 and 99 percentile to limit the influence of outliers on regression estimates. Panel F excludes alternating years. Panel G uses Fama-MacBeth (1973) estimations with standard error corrected using Pontiff (1996) method. The error term is assumed to follow a fourth-order autoregressive process. All the variables are defined under Table 1. All monetary items are measured in 2002 dollars. T-statistics are in parentheses. ***, **,* denote significance at 1%, 5% and 10% level. Standard errors are corrected for heteroscedasticity and are clustered at firm level.

Panel A Insider Tenure Squared	
Board tenure	0.0132
	(1.698)*
Board tenure squared	-0.0007
	(-2.130)**
Insider tenure	0.0071
	(2.332)**
Insider tenure squared	-0.0003
	(-3.624)***
Observations	13,989
R-squared	0.737
Panel B Average Tenure of All Directors	
Average tenure of all directors	0.0191
	(2.009)**
Average tenure of all directors squared	-0.0011
	(-2.479)**
Observations	13,989
R-squared	0.737
Panel C Exclude Utilities and Financials	
Board tenure	0.017
	(1.830)*
Board tenure squared	-0.0009
	(-2.263)**
Observations	11,709
R-squared	0.722
Panel D Measurement Errors	
Board tenure	0.0159
	(1.676)*
Board tenure squared	-0.0008
	(-1.812)*
Observations	9,412
R-squared	0.749
Panel E Truncate Board Tenure at 1 and 99 Percentile	
Board tenure	0.018
	(2.149)**
Board tenure squared	-0.001
	(-2.252)**
Observations	13,938
R-squared	0.767
Panel F Persistence in Governance Practices	
Board tenure	0.0214
	(1.938)*
Board tenure squared	-0.0013
	(-2.589)***
Observations	7,439
R-squared	0.755
Panel G Fama-MacBeth	
Board tenure	0.014
	(1.847)*
Board tenure squared	-0.001
	(-2.391)**
Average No of Obs each year	1058
Average R-squared	0.092