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Essays On The Effect Of Excess Compensation And Governance Changes On Firm Value

Mustafa A. Dah
University of Central Florida

ESSAYS ON THE EFFECT OF EXCESS COMPENSATION AND GOVERNANCE CHANGES ON FIRM VALUE

by

MUSTAFA A. DAH
M.B.A. Lebanese American University, 2007
B.S. Lebanese American University, 2005

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Major Professor: Melissa B. Frye

ABSTRACT

This dissertation consists of three essays on the effect of excess compensation and corporate governance changes on the firm's performance. The first paper utilizes a cost minimization stochastic frontier approach to investigate the efficiency of director total compensation. Our findings suggest that board members are over compensated. We show that, on average, the director actual compensation level is above the efficient compensation level by around 63%. Our results suggest that an increase in director excess compensation decreases the likelihood of CEO turnover, reduces the turnover-performance sensitivity, and increases managerial entrenchment. Thus, the surplus in director compensation is directly associated with managerial job security and entrenchment. Furthermore, although director excess compensation is not significantly inversely related to the firm's future performance, it has an indirect negative effect on future performance through its impact on the entrenchment-performance relationship. Therefore, this essay proposes that the overcompensation of directors is directly associated with a board culture predicated by mutual back-scratching and collusion between the CEO and the board members. The second essay tests the effect of an exogenous shock, the Sarbanes-Oxley Act (SOX) of 2002, on the structure of corporate boards and their efficiency as a monitoring mechanism. The results suggest an increase in the participation of independent directors at the expense of insiders. Consequently, we investigate the implications of board composition changes on CEO turnover and firm value. We document a noticeable reduction in CEO turnover in the post-SOX period. We also demonstrate that, after SOX, a board dominated by independent directors is less likely to remove a CEO due to poor performance. Finally, we highlight a negative association between the change in board composition and firm value. We propose that our findings are predicated on an off equilibrium result whereby firms were forced to modify

their endogenously chosen board composition. Therefore, contrary to the legislators' objectives, we suggest that the change in board structure brought about inefficient monitoring and promoted an unfavorable tradeoff between independent directors and insiders. The third essay examines the relationship between the firm's governance structure and its value during different economic conditions. We show that both relative industry turnover and CEO entrenchment increase during economic downturns. We also find that relative industry turnover and managerial entrenchment have opposite impacts on the value of the firm throughout the recessionary period. While industry turnover leads to an appreciation in firm value, managerial entrenchment reduces shareholders' wealth. The negative impact of managerial entrenchment on firm value, however, outweighs the positive impact of industry turnover. Accordingly, we propose that a recession provides managers with a good opportunity to camouflage their behavior and extract more private benefits and, thus, blame the poor performance on bad economic conditions.

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INTRODUCTION

This dissertation consists of three essays on the effect of excess compensation and governance changes on the value of the firm. Essay one employs a cost minimization stochastic frontier methodology to estimate director excess compensation. The stochastic frontier approach permits the estimation of excess compensation by dividing the conventional composite error term into two components: (i) the one-sided inefficiency term; and (ii) the two-sided random error term that accounts for measurement error. Accordingly, excess compensation is represented by the non-negative inefficiency term which measures the divergence of actual compensation from the efficient compensation frontier. Our findings highlight a substantial inefficiency in the total compensation of directors. During 1996-2006, on average, directors are overpaid by approximately 63% relative to their benchmark efficient level. In addition, we show that an increase in the overcompensation of directors leads to a decrease in the likelihood of CEO turnover, reduces the turnover-performance sensitivity, and increases managerial entrenchment. Therefore, we propose that the surplus in director compensation is directly associated with CEO immunity and entrenchment. In addition, we show that the excessive compensation of directors has an indirect effect on the firm's future performance through its impact on the entrenchment-performance relationship. That is, we suggest that the relation between managerial entrenchment and firm performance is negative and significant only when board members receive high excess compensation. Thus, we propose that director excess compensation signals the presence of some sort of a collusion and back-scratching relationship between the manager of the firm and his/her directors. Essay two investigates a unique event whereby firms experience an exogenous shock regarding the minimum participation of independent directors on the board. Thus, we examine whether the change in board structure, due to the passage of the Sarbanes-Oxley Act (SOX) of

2002, attains its intended objectives by enhancing the soundness of the firms' governance structure. Our findings highlight a noticeable and significant increase in the percentage of independent directors at the expense of insiders, following the passage of SOX. In addition, our results suggest a significant reduction in the likelihood of CEO turnover during the post-SOX period. We also show that, after SOX, a board dominated by independent directors is less likely to remove a CEO due to poor performance. Finally, we demonstrate that the change in board structure has a negative effect on firm value. Accordingly, we propose that forcing firms away from their endogenously determined board structures has a converse effect on the shareholders' interests and wealth. Therefore, contrary to the legislators' objectives, we suggest that the change in board composition brought about inefficient monitoring and promoted an unfavorable tradeoff between independent directors and insiders. Essay three investigates the effect of economic downturns on the relation between the firm's governance structure and its value. We demonstrate that business cycle fluctuations have a substantive influence on the soundness of the firm's governance structure. The essay suggests that managers may be subject to higher industry pressure during a recession due to the increase in relative industry turnover. On the other hand, we demonstrate that managers are more entrenched during economic downturns. That is, bad economic conditions amplify the manager's influence and authority within the firm. Finally, we show that relative industry turnover and managerial entrenchment have opposite impacts on the value of the firm during poor economic conditions. While industry turnover has a positive impact on firm performance, managerial entrenchment is negatively associated with firm performance. However, our results show that, during bad macroeconomic conditions, the negative impact of entrenchment on firm value outweighs the positive impact of turnover. Thus, we propose that economic downturns provide the managers with a good opportunity to camouflage their behavior and extract more private benefits and, thus, blame the poor performance on the economy.

ESSAY 1: EXCESS COMPENSATION AS A SIGN OF BOARD ENTRENCHMENT: A STOCHASTIC FRONTIER APPROACH

1. Introduction

Are board members overpaid? Does the board culture promote some sort of collusion or mutual back-scratching between the directors and the CEO? If so, how is firm performance affected by such a board environment? These issues have received increased attention by finance scholars. This paper addresses these questions by utilizing a cost minimization stochastic frontier approach to estimate the efficiency of director total compensation. Frontier analysis allows for the investigation of the presence and magnitude of excess compensation. In addition, we examine whether superfluous director compensation affects the soundness of the firms' governance structure and performance.

Prior literature suggests that excessive compensation is not beneficial to shareholders. Core et al. (1999) highlight a negative relation between the predicted component of CEO compensation and the firm's future performance. They also show that CEOs in firms where the agency problems are more pronounced have higher compensation levels. Moreover, they suggest that firms are expected to perform worse when the agency problems are more severe. Brick et al. (2006) propose a direct and significant relation between director excess compensation and CEO excess compensation. Furthermore, they document an inverse relation between the firms' future performance and the excessive compensation of both the CEOs and the directors. They suggest that their results are mainly due to weak corporate governance and back-scratching between the CEO and the board members, that is, "cronyism". These findings are consistent with Jensen (1993) who proposes that the board environment might prevent productive and effective monitoring.

Brick et al. (2006) define excess compensation as the difference between the observed compensation level and the expected compensation level after controlling for firm, governance, and CEO characteristics. That is, excess compensation is the residuals obtained from performing a regression of realized compensation on the variables hypothesized to explain compensation. However, the difference between actual and predicted compensation might just be due to estimation error. Thus, the error term may be representing excess compensation, statistical noise induced by some random factors or outliers, or a combination of both. In this paper, we employ a stochastic frontier approach to differentiate between excess compensation and random noise.

Stochastic frontier analysis (SFA) allows for the estimation of excess compensation, after controlling for measurement error, by introducing a systematic nonnegative error term. That is, by dividing the conventional composite error component into two components: (i) the one-sided inefficiency term; and (ii) the two-sided random error term that accounts for noise or estimation error. Stochastic frontier cost minimization analysis assumes that there exists a minimum compensation, for a given opportunity set, and that the observed compensation lies on or above that efficient frontier level. In such a case, the nonnegative inefficiency term measures the divergence of actual compensation from its benchmark efficient level. Therefore, the stochastic frontier methodology facilitates the measurement of excess compensation by allowing for a comparison between the realized compensation level and the efficient compensation frontier.

This study utilizes a stochastic frontier methodology to estimate excess compensation for the 1996-2006 period. We also split the whole sample period into two subsamples: 1996-2001 and 2002-2006. This allows for the examination of the effect of the Sarbanes-Oxley Act of 2002 on the efficiency of director compensation as well as the association between excess compensation and the firm's corporate governance and performance. Following the business scandals in the early 2000s (Enron, Adelphia, Tyco, WorldCom, etc.), the U.S. Congress enacted the Sarbanes-Oxley Act in an attempt to improve internal monitoring and the soundness of the firm's governance structure. However, the effectiveness of the legislation has been questioned.[1]

We start by investigating the efficiency of director total compensation. The stochastic frontier results suggest that director total compensation is not efficient. That is, in general, directors receive compensation that is in surplus to their efficient compensation level. During 1996-2006, the mean director compensation is approximately 63% above their efficient compensation frontier. Therefore, on average, directors are paid around $33,135 in excess of their benchmark compensation. Moreover, we document a decline in director overcompensation of approximately 36.5% in the post-SOX period, as opposed to the pre-SOX period.

While Brick et al. (2006) document a positive association between director and CEO excess compensation; we complement their work by investigating the relation between director overcompensation and other forms of "cronyism". In other words, we focus our research on director excess compensation and its implications on the firm's internal monitoring and performance. Overcompensation may act as an incentive for board members to exert more effort and, thus, improve the soundness of the firm's governance structure. On the other hand, the surplus in director compensation might signal that directors are entrenched and not effective monitors and, consequently, lead to "cronyism" between the CEO and the board members. Accordingly, we focus on the effect of director excess compensation on internal monitoring by examining CEO turnover and the turnover-performance sensitivity.[2] Moreover, we study the

[1] In general, the literature provides mixed evidence on the efficiency and effectiveness of the SOX regulation.

[2] Since directors are required to monitor the manager's actions and behavior, they are expected to dismiss CEOs who: (i) are ineffective or do not possess the necessary skill and knowledge to run the firm; and/or (ii) engage in

effect of director overcompensation on managerial entrenchment, as proxied by both the G-Index and E-Index.

Our results suggest an inverse relation between director excess compensation and CEO turnover. That is, an increase in director excess compensation lowers the probability of CEO dismissal. We also find that the manager's contract is less likely to be terminated due to poor performance when directors receive high excess compensation. Therefore, the overpayment of board members provides the CEO with additional immunity and job security. Consequently, we also investigate the impact of director excess compensation on CEO entrenchment. In general, our results highlight a direct relationship between the overcompensation of directors and managerial entrenchment. These findings suggest that director excess compensation can be interpreted as a sign of board entrenchment and, thus, it is associated with a board environment dominated by mutual back-scratching between the CEO and the board members. However, in the post-SOX period, our results are not as significant.

Finally, we examine the relation between director overcompensation and the firm's future performance. While we find an insignificant negative relation between the overpayment of board members and the firm's future abnormal returns, we do show that the excessive compensation of directors has an indirect effect on the firm's performance through its impact on the entrenchment-performance relationship. During the full sample period and the pre-SOX period, we find that the impact of managerial entrenchment on future performance is negative and significant only when board members receive high excess compensation. Specifically, our results suggest that a reduction in the firm's future performance occurs only when both the CEO and the

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fraudulent and manipulation activities. Huson, Parrino, and Starks (2001) focus on CEO turnover as a measure or indicator of the quality of internal monitoring.

directors are entrenched. The results are again not as significant during the post-SOX period, suggesting that SOX may have reduced the negative impact of director overcompensation on board culture.

The remaining parts of our paper are organized as follows. Section 2 explains the stochastic frontier methodology. Section 3 presents the data and descriptive statistics. Section 4 examines the efficiency of director total compensation. Section 5 studies the impact of director excess compensation on CEO turnover, turnover-performance sensitivity, and entrenchment. Section 6 investigates the effect of the surplus in director compensation on the firm's future performance and the entrenchment-performance relationship. Section 7 provides robustness checks. Section 8 concludes.

2. Stochastic Frontier Approach

2.1 Background

The stochastic frontier approach (SFA) was originally introduced in economics by Aigner, Lovell and Schmidt (1977), and Meeusen and Van Den Broeck (1977). It was first applied on production functions to calculate technical efficiency. Frontier analysis provides a way to estimate the production function of a fully efficient firm, that is, the efficient production frontier. Green (1993) proposes that the "technical efficiency" of a given firm depends on the// relation between its observed production level and its fully efficient production level. A firm is said to be producing at maximum efficiency if its realized production is equal to its efficient production. In such a case, the firm's actual output level lies on the efficient production frontier. However, if the firm's actual output level lies below its efficient production frontier, then the firm is said to be technically inefficient. As a result, the firm's technical efficiency is measured by the ratio of its observed production to its fully efficient production. The estimation of the efficient production frontier involves the regression of the firm's actual production on some explanatory variables that are expected to affect or determine the firm's output level. Consequently, the error term is split into an inefficiency term and a random error term. In the same sense, stochastic frontier cost minimization models were introduced to examine the firm's cost efficiency.

Hofler and Payne (1997) apply SFA to examine the efficiency of National Basketball Association (NBA) teams. They study whether the performance of different NBA teams deviates from its optimal level and by how much. Anderson et al. (1999) use a cost minimization SFA to determine efficiency in the hotel industry. They show that, on average, the deviation from the optimal frontier efficiency level is approximately 11%. Altunbas et al. (2001) employ a stochastic frontier cost minimization analysis to measure the inefficiency in the European Banking sector. Trip et al. (2002) utilize the stochastic frontier methodology to suggest a direct relationship between the firm's decision making quality and its efficiency.

While the SFA has been rarely applied in the finance literature, there are a few notable exceptions. Hunt-McCool, Koh, and Francis (1996) employ frontier analysis to reassess the issue of premarket IPO underpricing. Thus, they measure deliberate underpricing as the difference between the observed offer price and the maximized frontier price. Berger and Mester (1997) apply the stochastic frontier methodology, among other methods, to examine the sources of deviations in the efficiency of financial institutions. Habib and Ljungqvist (2005) utilize the stochastic frontier methodology to estimate agency costs. The authors produce an estimate of agency costs by comparing a firm's observed value, as proxied by its actual Tobin's Q, to the maximum value (Q*) of a hypothetical firm with identical features and characteristics. They find that, on average, a firm's actual Q deviates from Q* by approximately 16%. That is, on average, a firm's actual market value is around $1,432,000 below its maximum achievable value. They show that this reduction in the value of the firm, or agency cost, is mainly related to managerial incentives. Depken et al. (2006) also use SFA to measure the firm's agency cost. They examine how agency costs are affected by the firm's external and internal environment.

2.2 Efficient Compensation Benchmark

In this paper, we investigate whether director compensation is efficient. To determine whether a certain level of compensation is efficient, it has to be compared to a benchmark. In general, director compensation varies across firms for several reasons, including: (i) the industry that the firm is operating in; (ii) the size of the firm; (iii) investment and growth opportunities of the firm; (iv) firm risk; (v) financial distress; (vi) firm performance; (vii) the soundness of the firm's governance structure and monitoring environment. Therefore, we need to control for the firm's opportunity set and characteristics in order to refrain from comparing the compensation of different directors, who possess dissimilar characteristics and attributes. Thus, to measure the efficiency of director compensation in a given firm, we compare the actual director compensation level in that firm to the optimal minimum compensation level in a hypothetical firm with the same characteristics and attributes.[3] Consequently, we need to construct a frontier that represents the efficient compensation benchmark for any given set of firm characteristics and opportunities. Moreover, the efficient compensation frontier has to be stochastic. Specifically, the estimation of the efficient frontier has to account for measurement errors such

[3] We use the efficient compensation level of a hypothetical firm with the same opportunity set as a benchmark since the firm's actual efficient director compensation level is not observable.

that it is not affected by luck or extreme values.[4] Therefore, we utilize a stochastic frontier cost minimization approach to investigate the efficiency of director compensation. Accordingly, we estimate director excess compensation. A stochastic frontier function C* = f(X) is estimated by varying the firm characteristics and opportunity set (X). Thus, for any possible X, the efficient compensation frontier (C*) yields the minimum optimal compensation level that may be received by the firm's director, after accounting for estimation error.

A firm whose director's actual compensation is above the frontier is said to provide its board member with a compensation level that is in excess to that of a director of a hypothetical efficient frontier firm with the same opportunity set and characteristics (X). Therefore, excess compensation may be represented by the difference between the observed compensation level (C) and the efficient compensation level (C*), attained by employing a stochastic frontier approach.

2.3 Methodology

In a cost minimization stochastic frontier analysis, actual compensation can never lie below the efficient compensation frontier (C*). That is, actual compensation may only be on the frontier or above it. The stochastic frontier approach allows for this phenomenon by splitting the traditional ordinary least squares error term into an unexplained or inefficiency term[5] and a white

[4] Brick et al. (2006) measure excess compensation by comparing the actual compensation level to the predicted compensation level given firm, governance, and CEO characteristics. That is, expected compensation is employed as the benchmark compensation level. However, Brick et al. (2006) do not allow for statistical noise in their measurement of benchmark compensation.

[5] The inefficiency term accounts for the nonnegative difference between actual and efficient compensation.

noise term.[6] Therefore, let $C_{it} = X_{it}\beta + e_{it}$, where i = 1, 2,…,n refers to firm i and t = 1996, 1997, …, 2006 refers to year t. C_{it} is the realized total compensation. X_{it} is the set of explanatory variables hypothesized to predict the total compensation of directors. The compound error term e_{it} is defined as $e_{it} = v_{it} + u_{it}$. The bilaterally symmetrical white noise component $v_{it} \sim N(0, \sigma^2_v)$ is an iid random error term. v_{it} allows the efficient compensation level to be stochastic by accounting for measurement error and, thus, the benchmark compensation level is not influenced by outliers. Consequently, our measure of excess compensation is not associated with estimation error or luck. The one-sided strictly non-negative inefficiency term u_{it} is derived by truncation at zero of $N(0, \sigma^2_u)$. We assume that the unexplained error component (u_{it}) is an iid random variable with a half-normal distribution. Moreover, the two error components, v_{it} and u_{it}, are said to be independent of each other. In such a case, the spread between actual and efficient compensation is not associated with statistical noise. Furthermore, maximum likelihood estimation is employed to estimate the stochastic frontier model.

If director compensation in a given firm at a certain time is efficient, then $u_{it} = 0$. That is, the director receives the minimum (efficient) level of compensation given the firm's characteristics and opportunity set. Thus, the observed compensation level is equal to the efficient compensation level ($C = C^*$). In such a case, the stochastic frontier model converges to an ordinary least squares model. However, if the board member is overpaid, then the inefficiency term is strictly greater than 0. Accordingly, actual compensation lies above the minimum compensation benchmark ($C > C^*$).

[6] The white noise term allows for measurement error in the estimation of the efficient compensation frontier.

Consistent with the literature, we standardize our measure of excess compensation by estimating the firm's technical efficiency. Technical efficiency, also referred to as predicted efficiency, is calculated as the ratio of actual compensation (C) to efficient compensation ($C^* \equiv C - u$). That is, the technical efficiency of firm i at time t is given by the following formula:

$$TE_{it} = E(\exp(C_{it}) \setminus u_{it}, X_{it}) / E(\exp(C^*_{it}) \setminus u_{it} = 0, X_{it})$$ [7] (Equation 1)

Consequently, our measure of excess compensation lies between 1 and ∞.[8]

To examine whether the observed compensation level is efficient, we utilize a likelihood ratio test. Given the firm's characteristics and opportunity set, the actual compensation level is said to be efficient if the inefficiency term (u_{it}) is equal to 0. That is, a director's compensation is minimized only when he/she lies on the frontier. Therefore, we investigate whether, on average, $u = 0$. If the null hypothesis cannot be rejected, realized compensation is said to be efficient. As a result, the inefficiency term vanishes and, thus, the stochastic frontier model converges to an ordinary least squares model with a traditional error term. However, if excess compensation is present, then the inefficiency term exists. In such a case, we achieve a likelihood gain from using SFA instead of OLS.[9] Consequently, the realized compensation level lies above the efficient

[7] We take the exponential of total compensation (exp(C)) since it enters our stochastic frontier model in logs.

[8] Technical efficiency is never less than one since actual compensation is always greater or equal to efficient compensation.

[9] Since the ordinary least squares model inappropriately assumes that $\sigma_u = 0$, we achieve a likelihood gain from using the stochastic frontier approach when C is strictly greater than C*.

compensation level. The deviation between the two compensation levels is represented by the one-sided error term.

In addition, following Battese and Cora (1977), we define gamma (γ) as the ratio of the variance of the inefficiency term (σ^2_u) to the variance of the composite error term (σ^2_e). Thus, γ lies between 0 and 1. Consequently, γ helps examine how much of the variation in the error term (e) is explained by the variation in the inefficiency term (u). Moreover, γ provides an insight on whether the inefficiency term is different from 0 or not. That is, γ is approximately 0 when the compensation level is efficient.[10] On the other hand, if γ is close to 1, then most of the variation in the composite error term (e) is characterized by the variation in the inefficiency term (u) and, thus, the compensation level is inefficient.

3. Data and Descriptive Statistics

3.1 Data and Variable Definitions

The empirical analysis of the efficiency of director compensation, throughout the 1996-2006 period, is based on data from the following databases: CRSP, Compustat, ExecuComp, and RiskMetrics.[11] CRSP is used to acquire data regarding the firm's daily stock prices and returns. Compustat provides data concerning the firm's accounting and financial information. ExecuComp offers information pertaining to the top executives' compensation, turnover, and

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[10] The variance of the inefficiency term (σ^2_u) is almost 0 when compensation is efficient.

[11] We start our sample period in 1996 since the RiskMetrics Directors dataset does not report data prior to 1996. The RiskMetrics Directors dataset is mainly used to acquire information regarding board size and board composition, which are expected to have a substantial influence on the board culture and the efficiency of internal monitoring. Furthermore, the fact that the ExecuComp database does not provide information concerning the number of board meetings after 2006 prevents us from calculating director total compensation for that period.

characteristics. RiskMetrics is employed to obtain information regarding the firm's board characteristics and managerial entrenchment. To investigate the impact of SOX on the efficiency of director compensation, the whole sample period is divided into two sub-periods: 1996-2001 and 2002-2006.

Director total compensation is computed by the summation of cash compensation and the value of stock and option grants. Director cash compensation is equal to the annual director retainer plus the multiplication of the director meeting fee and the number of board meetings. Similar to Brick et al. (2006), since the value of directors' options is not given by ExecuComp, we use the per-option value of CEOs' options to proxy for the per-option value of directors' options.[12]

We utilize the ExecuComp database to document CEO turnovers. A CEO turnover is identified if the CEO in year t+1 is different from the CEO in year t. Accordingly, we introduce a turnover dummy variable (**Turnover**) that takes the value of 1 if turnover is observed in a given year and 0 otherwise.

We use the G-index and the E-index, developed by Gompers et al. (2003) and Bebchuk et al. (2009) respectively, to proxy for CEO entrenchment. Gompers et al. (2003) present their G-index based on 24 governance provisions to measure the soundness of the firm's corporate governance. Each governance provision is assigned a value of 0 or 1, depending on whether it boosts managerial entrenchment or not. In other words, a value of 1 is assigned to each provision if it leads to a reduction in shareholder rights. Bebchuk et al. (2009) propose that the importance of the G-index is limited to six provisions captured by their E-index.

[12] Brick et al. (2006) apply this approach since proxy statements propose that the per-option values of CEOs' and directors' options are generally very much alike.

Risk-adjusted returns are computed to measure the firm's performance. We use two measures of abnormal returns following the Fama-French (1993) 3-factor model and the Carhart (1997) 4-factor model. Therefore, we collect daily returns from CRSP and employ either of the two models to estimate risk-adjusted returns. Specifically, for each firm i in a given year t, abnormal returns are represented by the intercept (α_i) from the following regression models:

$$r_{id} - r_{fd} = \alpha_i + \beta(r_{Md} - r_{fd}) + sSMB_d + hHML_d + \varepsilon_{id} \qquad \text{(Equation 2)}$$

$$r_{id} - r_{fd} = \alpha_i + \beta(r_{Md} - r_{fd}) + sSMB_d + hHML_d + mMOM_d + \varepsilon_{id} \qquad \text{(Equation 3)}$$

where r_{id} is the return of firm i in day d in a certain year. r_{fd} is the simple daily T-bill rate. r_{Md}- r_{fd}, SMB_d, HML_d and MOM_d represent the market risk premium, size factor, book-to-market factor, and momentum factor, respectively. The daily data on these factors is obtained from Ken French's website.

In addition, we generally use the explanatory variables that were used by Brick et al. (2006) to predict director compensation. A detailed explanation of all the variables used in this paper is given in Table 1. We include industry and year dummy variables in all of our regression to control for unobserved industry and year specific characteristics. Industry is defined following the Fama and French (1997) 48-industry definition. We employ White (1980) robust standard errors to control for possible heteroskedasticity.

3.2 Descriptive Statistics

Table 2 provides descriptive statistics on director total compensation and all other variables that are hypothesized to explain compensation. Specifically, we compute the mean and standard deviation of these variables for the full sample period and the two sub-periods. During the entire sample period, the mean director total compensation is $85,914. The results highlight a substantial increase in director total compensation overtime. On average, the compensation that directors receive during the post-SOX period is approximately 55% higher than the amount that they obtain during the 1996-2001 period.

4. Efficiency of Director Compensation

In this section, we utilize a stochastic frontier approach to estimate director excess compensation. The natural logarithm of director total compensation is used as the dependent variable. As for the explanatory variables, we generally follow Brick et al. (2006) to account for CEO, governance, and firm characteristics. Table 3 presents the results of the stochastic frontier analysis employed to compute director excess compensation. In addition, we also present OLS regressions to compare the coefficient estimates between the two approaches. Table 3 shows that, in general, the coefficient estimates are very similar between the two approaches in terms of sign, magnitude, and significance.

Consistent with Bryan et al. (2000) and Brick et al. (2006), we find that director total compensation is directly associated with the required levels of firm monitoring and the complexity of the directors' job during the three sample periods: 1996-2001, 2002-2006, and 1996-2006. That is, our results highlight the positive impact of firm sales, R&D expenditures, and volatility on director total compensation.[13] Furthermore, we find that Tobin's Q and capital expenditures are directly associated with director compensation. Bryan et al. (2000) and Linn

[13] Bryan et al. (2000) and Linn and Park (2005) use firm size, R&D expenditures, and firm volatility to proxy for the need for monitoring and the complexity of the directors' job.

and Park (2005) propose that firms with higher investment and growth opportunities provide their board members with higher levels of compensation. In conformance with the findings of Brick et al. (2006), we highlight a negative relation between director total compensation and board size, percentage of inside directors, percentage of CEO equity, and PPE. Moreover, consistent with Bryan et al. (2000), we find an inverse association between leverage and director compensation. Firm leverage, therefore, appears to serve as an alternative monitoring mechanism (Jensen, 1986; Williamson, 1988). We also document a positive relation between duality and director compensation. A CEO who also serves as the Chair of the board may exercise more power and control over the board of directors. These firms may require more monitoring and, thus, directors receive higher levels of compensation. On the other hand, the direct association between duality and director compensation may be a sign of a poor governance structure or "cronyism". Furthermore, the firm's accounting performance, as proxied by ROA, has a negative effect on director compensation. This may suggest that a firm with poor accounting performance might require higher levels of monitoring. As expected, we highlight a positive and significant relation between the number of board meetings and director compensation.[14] That is, directors receive higher compensation as they meet more frequently.

We employ a likelihood ratio test to investigate whether directors' compensation is efficient or whether they are overpaid. That is, we test the null hypothesis that the inefficiency term is equal to zero. Our findings show that we can reject the null hypothesis in all three periods. Thus, on average, board members receive compensation that is significantly in excess of their efficient compensation level. While gamma equals 0.55 during the 1996-2001 period, it

[14] Note that the number of board meetings is used directly in the calculation of director compensation.

declines to 0.38 during the 2002-2006 period. Therefore, during 1996-2001, 55% of the variation in the error term is explained by the variation in the inefficiency term. On the other hand, the variation in the inefficiency term explains only 38% of the variation in the composite error term during the 2002-2006 period.

In addition, Table 3 presents the mean technical efficiency of director total compensation. As defined earlier, mean predicted u (as a percentage of C*) is equal to the ratio of director actual compensation (C) to director efficient compensation (C* = C - u). The results suggest that, on average, director actual compensation is around 163% of their efficient compensation during the full sample period. That is, on average, directors receive approximately $33,135 (63%) in excess of their benchmark compensation level.[15] Also, note that the percentage of director excess compensation diminishes by around 36.5% between the 1996-2001 period and the 2002-2006 period. Thus, although directors are still over compensated, they experience a reduction in their percentage of excessive compensation in the post-SOX period.

5. Excess Compensation, Turnover, and Entrenchment

5.1 Excess Compensation and Managerial Turnover

In this section, we study the effect of director excess compensation on managerial turnover. The overpayment of board members might induce them to work harder and exert more monitoring effort. Therefore, the CEO may be under more pressure and scrutiny from the board. Thus, increased director compensation may enhance the efficacy and productiveness of internal

[15] The average excess compensation (in dollars) is calculated by subtracting the mean director efficient compensation from the mean director actual compensation. That is, Mean Excess Compensation (in dollars) = C(1-(1/TE)).

monitoring. In such a case, we would expect a positive relation between director excess compensation and the likelihood of CEO turnover. Alternatively, the surplus in director compensation might be a sign of board entrenchment. In such a case, “cronyism” may take the form of increased job security for poor performing CEOs. Thus, director excess compensation may signal a failure on behalf of the board of directors to efficiently and effectively monitor the firm’s management. As a result, the overcompensation of directors may reduce the probability of managerial turnover.

Table 4 employs a probit model in which CEO turnover (Turnover) at time t+1 is regressed on director excess compensation at time t. All of the explanatory variables that are hypothesized to predict director total compensation are used as control variables. The results document that director overcompensation has a negative and significant impact on the likelihood of CEO turnover during the full sample period and the 1996-2001 sub-period. Thus, the CEO gains additional job security and protection as directors receive higher excess compensation. The surplus in director compensation does not seem to enhance internal monitoring. However, during the post-SOX period, the negative relation between director excess compensation and CEO turnover is not significant.

In addition, Table 4 documents that the likelihood of CEO turnover is directly related to firm volatility. Bushman, Dai, and Wang (2010) highlight a positive relation between CEO turnover and idiosyncratic risk. Moreover, we find that the prospect of CEO turnover rises as CEO age increases. The results also suggest a negative relation between managerial turnover and the percentage of CEO equity. The CEO’s power and control over the firm increases as his/her percentage equity ownership increases and, thus, the probability of CEO turnover declines.

5.2 Excess Compensation and Turnover-Performance Sensitivity

One might propose that the overpayment of board members induces them to exert more effort and, thus, improve the soundness of the firm's governance structure. This leads to a reduction in agency problems as the CEO is more inclined to work in the shareholders' best interests. As a consequence, the better alignment of interests between the owners of the firm and its management may lead to a reduction in the likelihood of managerial turnover. Therefore, the negative relation between director excess compensation and CEO turnover may be due to better governance. Therefore, we now explore whether the surplus in director compensation leads to the entrenchment of board members or whether it helps diminish agency problems by enhancing internal monitoring.

Accordingly, while we find evidence on an inverse relation between director excess compensation and CEO replacement, we also consider whether director overcompensation is related to the turnover-performance sensitivity. If the surplus in director compensation signals the entrenchment of board members, we expect directors receiving high excess compensation to be more reluctant to dismiss the CEO due to poor performance than those receiving low excess compensation. On the other hand, if the overcompensation of directors is associated with enhanced and more efficient monitoring, highly overly compensated directors are more likely to remove the CEO on the basis of poor performance.

During each of the three sample periods, an excess compensation dummy variable is defined to be equal to one if director excess compensation is higher than the median excess compensation during that period and zero otherwise. We use the firm's abnormal return at time t to measure firm performance. Risk-adjusted returns are calculated using both the Fama-French (1993) 3-factor model and the Carhart (1997) 4-factor model.

During all three sample periods, Table 5 columns 1, 5, and 9 highlight a negative relation between the director excess compensation dummy and CEO turnover. Therefore, consistent with our previous findings (Table 4), directors earning high excess compensation are less likely to terminate the CEO's contract than directors earning low excess compensation. Moreover, in line with the existing literature, our results document an inverse relation between the firm's abnormal returns, computed based on the Fama-French 3-factor model, and managerial turnover. A reduction in the firm's performance increases the possibility of CEO removal. We obtain analogous results when calculating abnormal returns based on Carhart's 4-factor model.

In addition, we introduce an interaction variable between the director excess compensation dummy and the firm's risk-adjusted returns in order to investigate the impact of director excess compensation on the turnover-performance sensitivity. During 1996-2006, columns 2 and 4 show that although the relation between director excess compensation and CEO turnover is negative, but it is no longer significant. The coefficient estimate for the firm's abnormal returns is negative and significant indicating that a reduction in the firm's performance increases the probability of CEO turnover when directors receive low excess compensation. Furthermore, we show that the interaction variable is positive and significant using both measures of firm performance. Therefore, the CEO is less likely to be dismissed due to poor firm performance when board members are highly over compensated. This suggests that the surplus in director compensation leads to poor monitoring by the board and is consistent with excess compensation facilitating board entrenchment. The entrenchment of the board members provides the CEO with increased protection and job security. Although we obtain similar findings during the 1996-2001 and 2002-2006 subsamples, the interaction variable is insignificant.

5.3 Excess Compensation and Managerial Entrenchment

Since our findings suggest that director excess compensation is directly associated with the CEO's job security, this may suggest a positive relation between managerial entrenchment and directors overpayment. Therefore, we investigate the impact of the surplus in director compensation on CEO entrenchment. Both the G-Index developed by Gompers et al. (2003) and the E-Index presented by Bebchuk et al. (2009) are utilized to measure managerial entrenchment.

Table 6 presents the regression of managerial entrenchment at time t+1 on director excess compensation at time t. We use all the variables that were previously employed to predict director total compensation as control variables. In general, the results suggest a positive association between director overcompensation and managerial entrenchment. Thus, shareholder rights decrease as directors receive additional excess compensation. However, the relation between director excessive compensation and managerial entrenchment (as proxied by the E-index or G-index) is not significant during the post-SOX period. The passage of SOX, which may have led to the reduction in the mean technical efficiency of director total compensation, may have helped reduce the direct effect of director excess compensation on board entrenchment and the lack of monitoring.

Table 6 also shows many control variables are significant with the expected sign. For example, managerial entrenchment is negatively related to Tobin's Q. Thus, managers are generally more entrenched in firms with low investment opportunities. Moreover, managerial entrenchment is adversely affected by firm size, as proxied by the natural logarithm of sales. Therefore, the managers of smaller firms tend to be more entrenched. Firm leverage seems to have a positive impact on CEO entrenchment. Thus, highly entrenched managers seem to borrow more. In general, the manager's authority in a given firm is expected to increase when he/she gets older. Unpredictably, the results highlight a negative relation between entrenchment and the age of the CEO. Furthermore, we highlight a positive relation between board size and managerial entrenchment. Several articles propose that large boards of directors are not successful in efficiently and effectively monitoring the firm's management (e.g. Yermack, 1996). In addition, the manager is more entrenched when he/she also serves as the chair of the board.

Again, our findings propose that director excess compensation signals the presence of collusion and back-scratching between the manager and the board members. Therefore, we provide evidence on the presence of other forms of "cronyism" between the CEO and the directors. That is, this paper finds that the surplus in director compensation is directly associated with CEO immunity and entrenchment.

6. Impact of Excess Compensation on Future Firm Performance

The surplus in director compensation may also have an adverse effect on the firm's future performance. Therefore, we next investigate the relation between director excess compensation and the firm's future risk-adjusted returns. We measure abnormal returns following both the Fama-French (1993) 3-factor model and the Carhart (1997) 4-factor model. All explanatory variables used to estimate director excess compensation are included as control variables.

The results presented in Table 7 show that the coefficient estimates for director excess compensation is negative but insignificant in all three sample periods, using both measures of future firm performance. Thus, an increase in director overcompensation does not directly imply a significant reduction in the firm's future abnormal returns.

However, we also explore whether the surplus in director compensation has an indirect effect on the firm's future performance through its effect on CEO entrenchment. Specifically, we examine the impact of director excess compensation on the relationship between managerial entrenchment and future firm performance.[16] Since we hypothesize that director overcompensation signals the entrenchment of board members, we study how firm performance is affected when both the CEO and the directors are entrenched.

In Table 8, we use the Fama-French abnormal returns at time t+1 as the dependent variable. We introduce an interaction variable between the director excess compensation dummy and CEO entrenchment in order to investigate how the entrenchment-performance relation is affected by director overcompensation. Again, managerial entrenchment is proxied by either the E-index or the G-index.

During 1996-2006, column 1 shows that the coefficient estimates for both the director excess compensation dummy and the E-index are insignificant. Using the G-index, column 3 reports similar results. Columns 2 and 4 report the regression results when the interaction variable between director excess compensation and managerial entrenchment is included. In both cases, the results suggest that the coefficient estimates for the excess compensation dummy variable is positive and significant. Therefore, when the manager is not entrenched, the surplus in director compensation seems to induce directors to exert more effort and, thus, improve the firm’s performance. Moreover, the coefficient estimate for managerial entrenchment is positive when directors receive low excess compensation. Columns 2 and 4 show that the coefficient estimates for the interaction variable are negative and significant. That is, we observe a significant negative change in the relationship between managerial entrenchment and future firm performance when board members receive high excess compensation. Therefore, our findings

[16] Gompers et al. (2003) and Bebchuk et al. (2009) propose that firm performance is adversely affected by managerial entrenchment.

suggest that it is the entrenchment combination of both the CEO and the directors that leads to a reduction in the firm's performance. Actually, there may be an improvement in firm performance if only one of the two parties is entrenched. In such a case, we suggest that director overpayment has an indirect adverse impact on future firm performance through its effect on the entrenchment-performance relationship.

In general, the results are similar for the 1996-2001 period. However, column 9 shows that the coefficient estimate for the E-index is negative and significant when the interaction variable is not included. During the post-SOX period, the findings are inconsistent with those of the 1996-2001 and 1996-2006 periods. We show that managerial entrenchment, using both the E-index and the G-index, is positively and significantly related to future firm performance. This result holds whether or not the interaction variable is included. These results are in line with the findings of Bhagat and Bolton (2010), who highlight a change in the relationship between the governance indices and firm performance in the post-SOX period. They show that although the relation between the governance indices and firm performance is negative in the pre-SOX period, an increase in the G-index has a positive effect on firm performance following the implementation of the Sarbanes-Oxley Act. Moreover, in the post-SOX period, Bhagat and Bolton (2010) suggest that the relation between the E-index and firm performance is inconsistent. In addition, although our results show that the coefficient estimate for the interaction variable is negative, it is not significant. This is in accordance with our previous suggestion that the post-SOX era provides an environment whereby the surplus in director compensation is not significantly associated with board entrenchment and poor monitoring.

7. Robustness Checks

Brick et al. (2006) examine the CEO and director excess compensation for the 1992-2001 period. Therefore, in unreported results, we also investigate the efficiency of director compensation for that same time period.[17] The results are generally equivalent to those documented for the 1996-2001 period. Specifically, we confirm the inefficiency of director compensation and the positive association between director overcompensation and board entrenchment.

Furthermore, we repeat all of our empirical analyses using the Brick et al. (2006) measure of excess compensation. That is, we define excess compensation as the residual in an ordinary least squares regression of total compensation on the variables hypothesized to explain total compensation. Except for the analysis of the efficiency of total compensation, the results obtained using the Brick et al. (2006) methodology are generally similar to those obtained by employing the stochastic frontier approach. That is, in general, the coefficient estimates are similar for both methodologies in terms of sign and significance. However, we find that measuring excess compensation following the Brick et al. (2006) approach yields biased coefficient estimates.

In addition, we examine how the entrenchment-performance relation is affected by director overcompensation when the firm's risk-adjusted returns are computed following Carhart's 4-factor model. The results are almost identical to those reported in table 9.

[17] In order to perform our stochastic frontier analysis for the 1992-2001 period, we drop both board size and the percentage of independent directors from our list of control variables since the RiskMetrics database does not report data prior to 1996.

8. Conclusion

This paper applies a stochastic cost frontier analysis to examine the efficiency of director compensation. Allowing for statistical noise, the frontier exemplifies the optimal level of compensation provided to the directors of the firm, given the firm's opportunity set and characteristics. Therefore, we measure excess compensation by comparing the actual compensation level to the efficient compensation benchmark.

Our findings highlight a substantial inefficiency in the total compensation of directors. On average, during 1996-2006, directors are overpaid by approximately 63% relative to their benchmark compensation. That is, the mean director total compensation is around $33,135 in surplus of the efficient compensation level. Consequently, we explore the impact of director excess compensation on the soundness of the firm's governance structure and performance.

We show that an increase in director overcompensation reduces the likelihood of managerial turnover. The results also indicate that the manager is less likely to be dismissed due to poor performance when board members are highly overcompensated. Moreover, our findings suggest that an increase in director excess compensation amplifies managerial entrenchment. Therefore, our results suggest that overpaying the board members helps the CEO gain additional job protection and increases his/her authority and control over the board. Accordingly, the excessive compensation of directors seems to be a sign of board entrenchment.

This paper suggests that the surplus in director compensation has an indirect effect on the firm's future performance. We find a significant negative change in the relationship between managerial entrenchment and the firm's future abnormal returns when the directors of that firm receive high excess compensation. In other words, managerial entrenchment has an adverse effect on future performance only when board members are highly overcompensated.

Overall, this article implies that overly compensating directors has a converse impact on the soundness of the firm's governance structure by promoting a board environment that is predicated by some sort of collusion and mutual back-scratching between the CEO and the directors. Our study complements the work of Brick et al. (2006) by suggesting the presence of a different type of "cronyism" between board members and the CEO. Specifically, we show that the surplus in director compensation is positively associated with managerial job security and entrenchment. Finally, it is interesting to note that the passage of the Sarbanes-Oxley Act may have enhanced the board culture by diminishing the significance of director excess compensation as a sign of socialization and board entrenchment.

Tables

Table 1. Variable Definitions

Variable	Variable Definition
Director Total Compensation	Director total compensation is computed by the summation of cash compensation and the value of stock and option grants. Director cash compensation is equal to the annual director retainer plus the multiplication of the director meeting fee and the number of board meetings. Similar to Brick et al. (2006), since the value of directors' options is not given by ExecuComp, we use the per-option value of the CEOs' options to proxy for the per-option value of the directors' options. The natural logarithm of Director total compensation is used.
CEO Total Compensation	CEO total compensation is calculated by adding the CEO's salary, bonus, the Black-Scholes value of options granted, the value of restricted stock granted, long-term incentive payouts, other annual and all other total compensation. The natural logarithm of CEO total compensation is used.
Q_{t-1}	The one period lagged Tobin's Q is computed following Chung & Pruitt (1994). It is equal to the sum of the Market Value of Equity, liquidating value of Preferred Stock, and Debt divided by the book value of Total Assets. The natural logarithm of Tobin's Q is used.
ROA_{t-1}	The one period lagged Return on Assets. It computed by taking the ratio of EBITDA to Total Assets. The natural logarithm of volatility is ROA.
Volatility	The Black-Scholes volatility measure. The natural logarithm of volatility is used.
$Sales_{t-1}$	The one period lagged firm sales. The natural logarithm of sales is used.
$Employees_{t-1}$	The one period lagged number of employees in a given firm. The natural logarithm of the number of employees is used.
$R\&D_{t-1}/At_{t-1}$	The one period lagged ratio of research and development expenses to total assets.
Adv_{t-1}/At_{t-1}	The one period lagged ratio of advertisement expenses to total assets.
$Leverage_{t-1}$	The one period lagged long term Debt. The natural logarithm of leverage is used.
PPE_{t-1}/At_{t-1}	The one period lagged ratio of property, plant, and equipment to Total Assets.
$Capx_{t-1}$	The one period lagged capital expenditures. The natural logarithm of capital expenditures is used.
Age	The CEO's age. The natural logarithm of the CEO's age is used.
Percentage CEO Equity	The percentage of the firm's equity that is held by the CEO.
Percentage Inside	The percentage of board members who are insiders.

Variable	Variable Definition
Board Size	The total number of board members.
Gender Dummy	A dummy variable equal to 1 if the CEO is a female and 0 otherwise.
Duality	Duality is a dummy variable equal to 1 if the CEO is also the chair of the board of directors and 0 otherwise.
Board Meetings	The natural logarithm of the number of board meetings is used.
Internal CEO	Internal CEO is a dummy variable equal to 1 if the CEO had been employed by the firm for more than one year before he/she became a CEO and 0 otherwise.
Turnover	A dummy variable that takes the value of 1 if CEO turnover is documented in a given year and 0 otherwise.
E-Index	E-Index is the entrenchment index presented by Bebchuk et al. (2009).
G-Index	G-Index is the governance index presented by Gompers et al. (2003).
Abnormal Return FF	The firm’s abnormal return measured following Fama and French (1993) 3-factor model.
Abnormal Return Carhart	The firm’s abnormal return measured following Carhart (1997) 4-factor model.

Table 2. Descriptive Statistics

	1996-2001		2002-2006		1996-2006	
Variable	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Director Total Compensation	69,931.25	114,882.20	108,677.60	418,725.60	85,914.53	283,614.60
CEO Total Compensation	4,936,441	14,560,350	5,089,621	7,145,256	5,006,600	11,759,480
Q_{t-1}	1.8906	3.6161	1.4110	1.4536	1.6484	2.7563
ROA $_{t-1}$	0.1334	0.1378	0.1134	0.1750	0.1234	0.1579
Volatility	0.4197	0.2209	0.4799	0.3264	0.4486	0.2783
$Sales_{t-1}$ (in Thousands)	3,964,757	10,693,870	5,140,071	15,051,610	4,562,884	13,106,830
$Employees_{t-1}$	18,020.46	47,892.94	19,680.19	57,979.18	18,797.26	52,858.71
$R\&D_{t-1}/At_{t-1}$	0.0322	0.0790	0.0301	0.1142	0.0311	0.0984
Adv_{t-1}/At_{t-1}	0.0114	0.0389	0.0115	0.0337	0.0114	0.0363
$Leverage_{t-1}$ (in Thousands)	2,058,481	13,433,800	1,549,342	8,945,899	2,549,565	16,639,520
PPE_{t-1}/At_{t-1}	0.2986	0.2371	0.2550	0.2259	0.2768	0.2326
$Capx_{t-1}$ (in Thousands)	284,674.3	1,101,771	285,577	1,145,070	283,831.7	1,059,835
Age	55.5763	7.8472	55.8419	7.6420	55.6982	7.7546
Percentage CEO Equity	0.0306	0.0699	0.0346	0.8581	0.0325	0.5821
Percentage Inside	22.3054	12.3309	18.4179	9.7453	20.5042	11.3734
Board Size	9.8086	3.1690	9.3930	2.5725	9.6161	2.9151
Gender Dummy	0.0115	0.1068	0.0209	0.1432	0.0159	0.1249

	1996-2001		2002-2006		1996-2006	
Variable	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Duality	0.7080	0.4547	0.5754	0.4943	0.6470	0.4779
Number of Board Meetings	7.2488	3.1647	7.6572	3.6279	7.4168	3.3689
Internal CEO	0.7445	0.4361	0.6343	0.4817	0.6949	0.4604

Table 2 presents descriptive statistics on Director Total Compensation, CEO Total Compensation, and the variables that are hypothesized to predict compensation. Specifically, this table provides the mean and standard deviation of these variables during the whole sample period (1996-2006), in addition to the 2 sub-periods (1996-2001 and 2002-2006).

Table 3. Director Efficient Compensation Frontier

Log (Director Total Compensation)	Least Squares			Stochastic Frontier Approach		
	1996-2006	1996-2001	2002-2006	1996-2006	1996-2001	2002-2006
Log (Q_{t-1})	0.2529***	0.2715***	0.2148***	0.2343***	0.2436***	0.2056***
	(0.0161)	(0.0225)	(0.0230)	(0.0130)	(0.0171)	(0.0204)
Log (ROA_{t-1})	-0.0606***	-0.0969***	-0.0399*	-0.0544***	-0.0848***	-0.0379*
	(0.0187)	(0.0304)	(0.0234)	(0.0146)	(0.0223)	(0.0199)
Log (Volatility)	0.1866***	0.2153***	0.1462***	0.1672***	0.1730***	0.1390***
	(0.0238)	(0.0359)	(0.0325)	(0.0233)	(0.0364)	(0.0311)
Log ($Sales_{t-1}$)	0.2326***	0.2181***	0.2468***	0.2309***	0.2123***	0.2479***
	(0.0151)	(0.0218)	(0.0208)	(0.0137)	(0.0189)	(0.0199)
Log ($Employees_{t-1}$)	-0.0739***	-0.0594***	-0.0925***	-0.0705***	-0.0520***	-0.0914***
	(0.0134)	(0.0196)	(0.0184)	(0.0122)	(0.0172)	(0.0172)
$R\&D_{t-1}/At_{t-1}$	1.2729***	1.2758***	1.3288***	1.3155***	1.3251***	1.3578***
	(0.2635)	(0.3566)	(0.3975)	(0.2139)	(0.2639)	(0.3598)
Adv_{t-1}/At_{t-1}	-0.3852	-0.5674	0.0813	-0.2913	-0.402	0.1158
	(0.2574)	(0.3611)	(0.3733)	(0.2806)	(0.3819)	(0.4275)
Log ($Leverage_{t-1}$)	-0.0098*	-0.0152*	-0.0049	-0.0088*	-0.0142**	-0.0045
	(0.0058)	(0.0087)	(0.0078)	(0.0049)	(0.0072)	(0.0068)
PPE_{t-1}/At_{t-1}	-0.3863***	-0.2784***	-0.5054***	-0.3717***	-0.2506***	-0.5008***
	(0.0558)	(0.0756)	(0.0849)	(0.0515)	(0.0689)	(0.0772)
Log ($Capx_{t-1}$)	0.0383***	0.0356***	0.0431***	0.0384***	0.0362***	0.0428***
	(0.0070)	(0.0098)	(0.0099)	(0.0057)	(0.0078)	(0.0085)
Log (AGE)	-0.2184***	-0.1238	-0.3179***	-0.2232***	-0.1326*	-0.3235***
	(0.0591)	(0.0791)	(0.0883)	(0.0529)	(0.0725)	(0.0779)
Percentage CEO Equity	-1.7616***	-1.8482***	-1.6920***	-1.8647***	-1.9586***	-1.7682***
	(0.1962)	(0.2167)	(0.3410)	(0.1270)	(0.1662)	(0.1962)
Percentage Inside	-0.0024***	-0.0017**	-0.0037***	-0.0026***	-0.0020***	-0.0038***
	(0.0006)	(0.0008)	(0.0009)	(0.0005)	(0.0007)	(0.0008)
Board Size	-0.0092***	-0.0031	-0.0153***	-0.0071**	-0.0015	-0.0132**
	(0.0035)	(0.0046)	(0.0053)	(0.0034)	(0.0045)	(0.0053)
Gender Dummy	0.1392**	0.2183*	0.0749	0.1451**	0.2113**	0.0849
	(0.0648)	(0.1243)	(0.0636)	(0.0660)	(0.1018)	(0.0864)
Duality	0.0507***	0.0685***	0.0319	0.0484***	0.0703***	0.0287
	(0.0165)	(0.0238)	(0.0232)	(0.0158)	(0.0225)	(0.0222)

Log (Director Total Compensation)	Least Squares			Stochastic Frontier Approach		
Log (Number of Board Meetings)	0.2246***	0.2340***	0.2088***	0.2320***	0.2508***	0.2112***
	(0.0214)	(0.0298)	(0.0307)	(0.0196)	(0.0271)	(0.0283)
Internal CEO	-0.0179	-0.0211	-0.0128	-0.0124	-0.0114	-0.0099
	(0.0171)	(0.0258)	(0.0227)	(0.0159)	(0.0230)	(0.0218)
Intercept	3.0364***	2.3709***	3.7297***	2.8769***	1.9829***	3.4593***
	(0.2781)	(0.3892)	(0.4016)	(0.2656)	(0.3629)	(0.3785)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Sq	0.2663	0.2684	0.2724			
Likelihood-ratio test of u=0				35.04***	24.70***	11.01***
Mean predicted u (as % of C*)				162.78%	181.16%	144.62%
σ_v				0.5694	0.5428	0.5861
σ_u				0.5366	0.6037	0.4578
σ^2				0.6122	0.659	0.5531
γ				0.4703	0.553	0.3789
Number of Observations	8944	4759	4185	8944	4759	4185

Table 3 presents the stochastic frontier estimation of Director efficient compensation during the whole sample period (1996-2006), in addition to the 2 sub-periods (1996-2001 and 2002-2006). Moreover, we also report the coefficient estimates from an OLS regression. The dependent variable is Director Total Compensation. Industry and year dummies are included to control for industry and year specific characteristics. We define industry based on Fama and French 48-industry definition. Table 1 provides detailed information on all variables. In our OLS regression, we compute robust standard errors following White (1980) to account for any possible heteroskedasticity. We employ a likelihood ratio test to investigate the efficiency of director compensation. The mean predicted u (as a percentage of C*) is equal to the ratio of directors' actual compensation (C) to directors' efficient compensation (C* = C - u). Standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 4. Director Excess Compensation and CEO Turnover

$Turnover_{t+1}$	1996-2006	1996-2001	2002-2006
Director Excess $Compensation_t$	-0.2854***	-0.2683***	-0.2070
	(0.0605)	(0.0588)	(0.1327)
Log (Q_{t-1})	-0.0065	-0.0466	0.0453
	(0.0318)	(0.0417)	(0.0517)
Log (ROA_{t-1})	-0.0072	0.0530	-0.0685
	(0.0365)	(0.0575)	(0.0503)
Log (Volatility)	0.2008***	0.3498***	0.0970
	(0.0539)	(0.0802)	(0.0782)
Log ($Sales_{t-1}$)	0.0191	0.0512	0.0201
	(0.0360)	(0.0507)	(0.0536)
Log ($Employees_{t-1}$)	-0.0204	-0.0736	0.0172
	(0.0319)	(0.0453)	(0.0466)
$R\&D_{t-1}/At_{t-1}$	0.2310	-0.4564	1.0099
	(0.5726)	(0.7749)	(0.9695)
Adv_{t-1}/At_{t-1}	1.2433*	0.8062	1.8563*
	(0.7027)	(0.9621)	(1.1045)
Log ($Leverage_{t-1}$)	-0.0270**	-0.0176	-0.0372**
	(0.0125)	(0.0185)	(0.0175)
PPE_{t-1}/At_{t-1}	0.0392	-0.0364	0.1138
	(0.1336)	(0.1795)	(0.2067)
Log ($Capx_{t-1}$)	0.0502***	0.0610***	0.0334
	(0.0158)	(0.0220)	(0.0237)
Log (AGE)	1.3595***	1.3504***	1.3941***
	(0.1403)	(0.1916)	(0.2132)
Percentage CEO Equity	-0.5860*	-0.6359	-0.5155
	(0.3452)	(0.4627)	(0.5348)
Percentage Inside	0.0008	-0.0008	0.0031
	(0.0014)	(0.0018)	(0.0022)
Board Size	0.0091	0.0114	0.0044
	(0.0087)	(0.0114)	(0.0140)
Gender Dummy	-0.2230	-0.6876*	0.0022
	(0.1913)	(0.3660)	(0.2320)

Turnover $_{t+1}$	1996-2006	1996-2001	2002-2006
Duality	-0.0462	-0.1161**	0.0142
	(0.0402)	(0.0574)	(0.0585)
Log (Number of Board Meetings)	0.4927***	0.5446***	0.4593***
	(0.0495)	(0.0679)	(0.0749)
Internal CEO	0.4741***	0.4461***	0.4910***
	(0.0450)	(0.0653)	(0.0636)
Intercept	-8.3935***	-7.7766***	-13.2081
	(0.7838)	(1.0100)	(0.9739)
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Pseudo R-Sq	0.067	0.0802	0.0709
Number of Observations	8570	4523	4028

Table 4 employs a probit model to investigate the impact of director excess compensation on CEO turnover during the whole sample period (1996-2006), in addition to the 2 sub-periods (1996-2001 and 2002-2006). The dependent variable is CEO turnover at time t+1. Director excess compensation is measured by utilizing a stochastic frontier approach. We include all the variables that were hypothesized to explain director total compensation as control variables. Industry and year dummies are included to control for industry and year specific characteristics. We define industry based on Fama and French 48-industry definition. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. Standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 5. Director Excess Compensation and CEO Turnover-Performance Sensitivity

$Turnover_{t+1}$	1996-2006				1996-2001				2002-2006			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Excess $Dummy_t$	-0.2085***	-0.0709	-0.2084***	-0.064	-0.2819***	-0.2553	-0.2817***	-0.2738	-0.1452***	-0.1251	-0.1451***	-0.1076
	(0.0366)	(0.0816)	(0.0366)	(0.0822)	(0.0504)	(0.3127)	(0.0504)	(0.3215)	(0.0542)	(0.1106)	(0.0542)	(0.1112)
Abnormal Return FF_t	-0.1024***	-0.1488***			-0.3355***	-0.3419***			-0.0856	-0.0988		
	(0.0287)	(0.0379)			(0.0840)	(0.1119)			(0.0715)	(0.0956)		
Excess $Dummy_t$ * Abnormal Return FF_t		0.1024*				0.0141				0.028		
		(0.0543)				(0.1643)				(0.1341)		
Abnormal Return $Carhart_t$			-0.1041***	-0.1532***			-0.3524***	-0.3543***			-0.087	-0.1116
			(0.0291)	(0.0384)			(0.0868)	(0.1153)			(0.0717)	(0.0958)
Excess $Dummy_t$ * Abnormal Return $Carhart_t$				0.1079**				0.0042				0.0519
				(0.0550)				(0.1700)				(0.1345)
Log (Q_{t-1})	0.0016	0.003	0.0018	0.0032	-0.0412	-0.0413	-0.0417	-0.0417	0.0375	0.0375	0.0379	0.0379
	(0.0321)	(0.0321)	(0.0321)	(0.0321)	(0.0426)	(0.0426)	(0.0426)	(0.0426)	(0.0523)	(0.0523)	(0.0523)	(0.0523)
Log (ROA_{t-1})	-0.0277	-0.0277	-0.0278	-0.0279	0.0474	0.0475	0.0487	0.0488	-0.0654	-0.065	-0.0656	-0.0649
	(0.0372)	(0.0372)	(0.0372)	(0.0372)	(0.0585)	(0.0586)	(0.0586)	(0.0586)	(0.0520)	(0.0520)	(0.0519)	(0.0520)
Log (Volatility)	0.2391***	0.2381***	0.2401***	0.2390***	0.3842***	0.3840***	0.3888***	0.3888***	0.1198	0.1191	0.1204	0.1192
	(0.0561)	(0.0561)	(0.0561)	(0.0562)	(0.0827)	(0.0827)	(0.0828)	(0.0828)	(0.0824)	(0.0825)	(0.0825)	(0.0825)
Log ($Sales_{t-1}$)	0.0223	0.0218	0.0224	0.0219	0.0455	0.0454	0.0456	0.0456	0.0013	0.0013	0.0014	0.0015
	(0.0370)	(0.0371)	(0.0370)	(0.0371)	(0.0525)	(0.0525)	(0.0525)	(0.0525)	(0.0549)	(0.0549)	(0.0548)	(0.0548)
Log ($Employees_{t-1}$)	-0.0209	-0.0207	-0.021	-0.0208	-0.0736	-0.0735	-0.0737	-0.0737	0.0266	0.0266	0.0266	0.0265
	(0.0327)	(0.0327)	(0.0327)	(0.0327)	(0.0468)	(0.0469)	(0.0469)	(0.0469)	(0.0475)	(0.0475)	(0.0475)	(0.0475)
$R\&D_{t-1}/AT_{t-1}$	-0.0217	0.0009	-0.0231	-0.0012	-0.4354	-0.4329	-0.4431	-0.4424	0.7914	0.7928	0.7962	0.7988
	(0.5893)	(0.5877)	(0.5896)	(0.5880)	(0.7783)	(0.7788)	(0.7805)	(0.7810)	(0.9961)	(0.9961)	(0.9961)	(0.9960)
$R\&D_{t-1}/AT_{t-1}$	1.1138	1.1133	1.1133	1.1127	1.0074	1.009	1.0122	1.0127	1.7416	1.7478	1.742	1.7542
	(0.7068)	(0.7060)	(0.7067)	(0.7059)	(0.9605)	(0.9607)	(0.9605)	(0.9607)	(1.1208)	(1.1213)	(1.1206)	(1.1214)
Log ($Leverage_{t-1}$)	-0.0265**	-0.0260**	-0.0264**	-0.0260**	-0.0112	-0.0112	-0.0109	-0.0109	-0.0407**	-0.0407**	-0.0408**	-0.0407**
	(0.0126)	(0.0126)	(0.0126)	(0.0126)	(0.0188)	(0.0188)	(0.0188)	(0.0188)	(0.0176)	(0.0176)	(0.0176)	(0.0176)
PPE_{t-1}/AT_{t-1}	0.0089	0.0094	0.009	0.0094	-0.0218	-0.022	-0.0194	-0.0194	0.0765	0.0756	0.0762	0.0746

Turnover$_{t+1}$	1996-2006				1996-2001				2002-2006			
	(0.1368)	(0.1369)	(0.1368)	(0.1369)	(0.1845)	(0.1845)	(0.1845)	(0.1845)	(0.2116)	(0.2117)	(0.2116)	(0.2116)
Log (Capx$_{t-1}$)	0.0501***	0.0500***	0.0502***	0.0500***	0.0560**	0.0560**	0.0557**	0.0557**	0.0460*	0.0461*	0.0461*	0.0462*
	(0.0161)	(0.0161)	(0.0161)	(0.0161)	(0.0224)	(0.0224)	(0.0224)	(0.0224)	(0.0244)	(0.0245)	(0.0244)	(0.0245)
Log (AGE)	1.3249***	1.3267***	1.3245***	1.3266***	1.2216***	1.2220***	1.2225***	1.2226***	1.4390***	1.4386***	1.4377***	1.4371***
	(0.1419)	(0.1419)	(0.1419)	(0.1419)	(0.1946)	(0.1946)	(0.1946)	(0.1947)	(0.2153)	(0.2153)	(0.2153)	(0.2153)
Percentage CEO Equity	-0.6338*	-0.6362*	-0.6348*	-0.6375*	-0.8116	-0.8109	-0.8158*	-0.8156*	-0.3662	-0.3635	-0.3664	-0.3613
	(0.3567)	(0.3567)	(0.3567)	(0.3567)	(0.4951)	(0.4952)	(0.4951)	(0.4952)	(0.5294)	(0.5296)	(0.5293)	(0.5296)
Percentage Inside	0.0002	0.0003	0.0002	0.0003	-0.0009	-0.0009	-0.0009	-0.0009	0.0028	0.0028	0.0028	0.0028
	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0022)	(0.0022)	(0.0022)	(0.0022)
Board Size	0.0094	0.0095	0.0094	0.0095	0.0167	0.0167	0.0168	0.0168	0.0024	0.0024	0.0024	0.0024
	(0.0088)	(0.0088)	(0.0088)	(0.0088)	(0.0117)	(0.0117)	(0.0117)	(0.0117)	(0.0142)	(0.0142)	(0.0142)	(0.0142)
Gender Dummy	-0.1627	-0.1592	-0.163	-0.1594	-0.6173*	-0.6168*	-0.6186*	-0.6185*	0.0234	0.0252	0.0232	0.0266
	(0.1917)	(0.1919)	(0.1917)	(0.1919)	(0.3724)	(0.3724)	(0.3729)	(0.3729)	(0.2314)	(0.2314)	(0.2314)	(0.2313)
Duality	-0.0538	-0.0532	-0.0536	-0.053	-0.1022*	-0.1023*	-0.1014*	-0.1014*	0.009	0.0091	0.0093	0.0095
	(0.0409)	(0.0409)	(0.0409)	(0.0409)	(0.0585)	(0.0585)	(0.0585)	(0.0585)	(0.0594)	(0.0594)	(0.0594)	(0.0594)
Log (Number of Board Meetings)	0.4694***	0.4711***	0.4695***	0.4713***	0.4942***	0.4943***	0.4934***	0.4934***	0.4390***	0.4391***	0.4390***	0.4392***
	(0.0506)	(0.0506)	(0.0506)	(0.0506)	(0.0701)	(0.0701)	(0.0701)	(0.0701)	(0.0764)	(0.0764)	(0.0764)	(0.0764)
Internal CEO	0.4670***	0.4667***	0.4671***	0.4668***	0.4562***	0.4561***	0.4563***	0.4562***	0.4897***	0.4899***	0.4898***	0.4902***
	(0.0455)	(0.0455)	(0.0455)	(0.0455)	(0.0665)	(0.0665)	(0.0665)	(0.0665)	(0.0641)	(0.0641)	(0.0641)	(0.0641)
Intercept	-8.7007***	-8.7771***	-8.7013***	-8.7825***	-8.1396***	-8.1529***	-8.1665***	-8.1705***	-13.5187***	-13.5304***	-13.5165***	-13.539***
	(0.7892)	(0.7904)	(0.7892)	(0.7904)	(1.0315)	(1.0428)	(1.0318)	(1.0438)	(0.9872)	(0.9927)	(0.9883)	(0.9935)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-Sq	0.0698	0.0703	0.0698	0.0704	0.0859	0.0859	0.086	0.086	0.0738	0.0738	0.0738	0.0738
Number of Observations	8386	8386	8386	8386	4390	4390	4390	4390	3977	3977	3977	3977

Table 5 employs a probit model to investigate the impact of director excess compensation on the CEO turnover-performance sensitivity during the whole sample period (1996-2006), in addition to the 2 sub-periods (1996-2001 and 2002-2006). The dependent variable is CEO turnover at time t+1. During each sample period, an excess compensation dummy variable is defined to be equal to 1 if director excess compensation is greater than the mean excess compensation during that period and 0 otherwise. To measure firm performance, we calculate the firm's abnormal return at time t following both the Fama-French (1993) 3-factor model and Carhart (1997) 4-factor model. We include all the variables that were hypothesized to explain director total compensation as control variables. Industry and year dummies are included to control for industry and year specific characteristics. We define industry based on Fama and French 48-industry definition. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. Standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 6. Director Excess Compensation and CEO Entrenchment

	$E\text{-Index}_{t+1}$			$G\text{-Index}_{t+1}$		
	1996-2006	1996-2001	2002-2006	1996-2006	1996-2001	2002-2006
Director Excess Compensation	0.1173**	0.1165***	0.1654	0.0012	0.0198	-0.0207
	(0.0526)	(0.0383)	(0.1155)	(0.0660)	(0.0773)	(0.1343)
Log (Q_{t-1})	-0.1961***	-0.2286***	-0.1592***	-0.2708***	-0.3277***	-0.1902**
	(0.0257)	(0.0336)	(0.0404)	(0.0505)	(0.0656)	(0.0810)
Log (ROA_{t-1})	0.1232***	0.1496***	0.1072***	0.1690***	0.1609*	0.1743**
	(0.0302)	(0.0472)	(0.0404)	(0.0595)	(0.0929)	(0.0811)
Log (Volatility)	-0.0773	-0.0422	-0.1145	-0.9035***	-0.9495***	-0.7969***
	(0.0507)	(0.0728)	(0.0717)	(0.0972)	(0.1472)	(0.1315)
Log ($Sales_{t-1}$)	-0.1743***	-0.1952***	-0.1633***	-0.3699***	-0.3703***	-0.3791***
	(0.0292)	(0.0407)	(0.0425)	(0.0570)	(0.0801)	(0.0815)
Log ($Employees_{t-1}$)	0.0719***	0.1234***	0.0273	0.3763***	0.4337***	0.3545***
	(0.0254)	(0.0366)	(0.0360)	(0.0494)	(0.0696)	(0.0712)
$R\&D_{t-1}/At_{t-1}$	-0.0370	-0.2879	0.6393	-0.7322	-1.6942	0.2494
	(0.4298)	(0.5958)	(0.6459)	(0.8653)	(1.2208)	(1.2960)
Adv_{t-1}/At_{t-1}	-0.3882	-0.1778	-1.4392	0.0254	0.7092	-3.2282**
	(0.5523)	(0.7208)	(0.9688)	(1.0357)	(1.4115)	(1.4570)
Log ($Leverage_{t-1}$)	0.0392***	0.0564***	0.0262**	0.1139***	0.0953***	0.1350***
	(0.0096)	(0.0141)	(0.0132)	(0.0190)	(0.0286)	(0.0258)
PPE_{t-1}/At_{t-1}	0.2387**	0.3254**	0.1606	0.0350	0.0324	0.0505
	(0.1109)	(0.1510)	(0.1652)	(0.2067)	(0.2844)	(0.3022)
Log ($Capx_{t-1}$)	-0.0212	-0.0407**	-0.0053	-0.0774***	-0.0509	-0.1295***
	(0.0136)	(0.0183)	(0.0211)	(0.0278)	(0.0381)	(0.0412)
Log (AGE)	-0.3647***	-0.2635*	-0.6004***	-0.4002*	-0.0170	-1.0788***
	(0.1100)	(0.1543)	(0.1606)	(0.2087)	(0.3004)	(0.2957)
Percentage CEO Equity	-3.0690***	-3.4868***	-2.4651***	-4.8126***	-5.3291***	-3.7784***
	(0.3632)	(0.3574)	(0.6284)	(0.7145)	(0.7603)	(1.1938)
Percentage Inside	-0.0082***	-0.0072***	-0.0096***	-0.0115***	-0.0097***	-0.0146***
	(0.0011)	(0.0014)	(0.0017)	(0.0022)	(0.0028)	(0.0034)
Board Size	0.0291***	0.0257***	0.0355***	0.1432***	0.1405***	0.1496***
	(0.0072)	(0.0093)	(0.0117)	(0.0138)	(0.0184)	(0.0218)
Gender Dummy	-0.1809	-0.3064	-0.0714	-0.5624*	-0.6354	-0.4767

	$E\text{-}Index_{t+1}$			$G\text{-}Index_{t+1}$		
	(0.1637)	(0.2532)	(0.2153)	(0.3225)	(0.5473)	(0.3920)
Duality	0.2106***	0.1996***	0.2271***	0.4707***	0.5130***	0.4382***
	(0.0332)	(0.0480)	(0.0465)	(0.0641)	(0.0945)	(0.0879)
Log (Number of Board Meetings)	0.1663***	0.1142**	0.2318***	0.4829***	0.4174***	0.5595***
	(0.0397)	(0.0554)	(0.0577)	(0.0781)	(0.1106)	(0.1103)
Internal CEO	0.1020***	0.1037**	0.1154***	0.0277	0.0714	0.0076
	(0.0320)	(0.0473)	(0.0438)	(0.0632)	(0.0966)	(0.0841)
Intercept	3.4602***	3.2335***	4.0684***	9.2905***	6.5653***	12.7490***
	(0.5180)	(0.7423)	(0.7539)	(1.0257)	(1.5342)	(1.4068)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Sq	0.1191	0.1218	0.1247	0.1766	0.1968	0.1610
Number of Observations	7253	3885	3368	7435	3967	3468

Table 6 examines the impact of director excess compensation on managerial entrenchment during the whole sample period (1996-2006), in addition to the 2 sub-periods (1996-2001 and 2002-2006). The dependent variable is CEO entrenchment, as proxied by both the E-index and the G-index, at time t+1. Director excess compensation is measured by utilizing a stochastic frontier approach. We include all the variables that were hypothesized to explain director total compensation as control variables. Industry and year dummies are included to control for industry and year specific characteristics. We define industry based on Fama and French 48-industry definition. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. Standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 7. Director Excess Compensation and Future Firm Performance

	Abnormal Return FF_{t+1}			Abnormal Return $Carhart_{t+1}$		
	1996-2006	1996-2001	2002-2006	1996-2006	1996-2001	2002-2006
Director Excess Compensation	-0.0022	-0.0048	-0.0040	-0.0015	-0.0053	-0.0024
	(0.0048)	(0.0091)	(0.0082)	(0.0049)	(0.0091)	(0.0081)
Log (Q_{t-1})	-0.0129***	-0.0186***	-0.0041	-0.0138***	-0.0212***	-0.0031
	(0.0044)	(0.0068)	(0.0046)	(0.0044)	(0.0067)	(0.0047)
Log (ROA_{t-1})	0.0084	0.0091	0.0035	0.0118**	0.0122	0.0064
	(0.0053)	(0.0101)	(0.0049)	(0.0052)	(0.0099)	(0.0049)
Log (Volatility)	0.0092	0.0244	0.0010	0.0131*	0.0326**	0.0017
	(0.0071)	(0.0150)	(0.0073)	(0.0070)	(0.0147)	(0.0073)
Log ($Sales_{t-1}$)	0.0105***	0.0132*	0.0083**	0.0115***	0.0132*	0.0107***
	(0.0041)	(0.0072)	(0.0042)	(0.0040)	(0.0070)	(0.0041)
Log ($Employees_{t-1}$)	-0.0058	-0.0052	-0.0065	-0.0061	-0.0050	-0.0072*
	(0.0052)	(0.0097)	(0.0041)	(0.0051)	(0.0095)	(0.0040)
$R\&D_{t-1}/At_{t-1}$	0.3591***	0.4914***	0.0253	0.3377***	0.4585***	0.0207
	(0.0816)	(0.1167)	(0.0948)	(0.0791)	(0.1092)	(0.0959)
Adv_{t-1}/At_{t-1}	0.0399	-0.0224	0.1028	0.0483	-0.0057	0.1012
	(0.0772)	(0.1150)	(0.0967)	(0.0764)	(0.1122)	(0.0992)
Log ($Leverage_{t-1}$)	-0.0016	-0.0042	0.0007	-0.0014	-0.0048	0.0013
	(0.0030)	(0.0067)	(0.0014)	(0.0029)	(0.0067)	(0.0014)
PPE_{t-1}/At_{t-1}	0.0683**	0.1011*	0.0335**	0.0665**	0.0928	0.0415**
	(0.0337)	(0.0612)	(0.0166)	(0.0335)	(0.0608)	(0.0165)
Log ($Capx_{t-1}$)	-0.0039	-0.0045	-0.0022	-0.0037	-0.0032	-0.0031
	(0.0030)	(0.0060)	(0.0018)	(0.0030)	(0.0059)	(0.0019)
Log (AGE)	0.0038	0.0063	0.0071	0.0001	0.0015	0.0048
	(0.0208)	(0.0305)	(0.0153)	(0.0205)	(0.0296)	(0.0156)
Percentage CEO Equity	-0.0052	-0.0474	0.0305	-0.0067	-0.0531	0.0346
	(0.0507)	(0.0848)	(0.0507)	(0.0503)	(0.0837)	(0.0511)
Percentage Inside	0.0000	0.0001	-0.0001	0.0000	0.0000	-0.0001
	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0003)	(0.0002)
Board Size	-0.0010	-0.0014	0.0001	-0.0011	-0.0013	-0.0000
	(0.0009)	(0.0015)	(0.0010)	(0.0009)	(0.0014)	(0.0010)
Gender Dummy	-0.0051	-0.0177	0.0065	-0.0048	-0.0150	0.0042
	(0.0151)	(0.0293)	(0.0160)	(0.0150)	(0.0289)	(0.0164)

	Abnormal Return FF_{t+1}			Abnormal Return $Carhart_{t+1}$		
Duality	0.0136***	0.0114	0.0070	0.0131***	0.0108	0.0065
	(0.0045)	(0.0075)	(0.0046)	(0.0044)	(0.0072)	(0.0046)
Log (Number of Board Meetings)	-0.0189	-0.0354	-0.0025	-0.0209*	-0.0369	-0.0047
	(0.0123)	(0.0246)	(0.0064)	(0.0123)	(0.0244)	(0.0065)
Internal CEO	-0.0103	-0.0213	-0.0000	-0.0114	-0.0220	-0.0017
	(0.0108)	(0.0215)	(0.0046)	(0.0107)	(0.0214)	(0.0046)
Intercept	-1.3245***	-1.5065***	-1.1075***	-1.2993***	-1.4618***	-1.1082***
	(0.0811)	(0.1266)	(0.0723)	(0.0798)	(0.1233)	(0.0730)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Sq	0.0124	0.0318	0.0100	0.0122	0.0320	0.0113
Number of Observations	8281	4330	3951	8281	4330	3951

Table 7 examines the impact of director excess compensation on the firm's future performance during the whole sample period (1996-2006), in addition to the 2 sub-periods (1996-2001 and 2002-2006). The dependent variable is the firm's abnormal return, as measured by both the Fama-French (1993) 3-factor model and the Carhart (1997) 4-factor model, at time t+1. Director excess compensation is measured by utilizing a stochastic frontier approach. We include all the variables that were hypothesized to explain director total compensation as control variables. Industry and year dummies are included to control for industry and year specific characteristics. We define industry based on Fama and French 48-industry definition. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. Standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 8. Director Excess Compensation and the Entrenchment-Performance Relationship

Abnormal Return FF_{t+1}	1996-2006				1996-2001				2002-2006			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Excess $Dummy_t$	0.0027	0.0198**	0.0035	0.0353**	-0.0001	0.0251**	-0.0010	0.0576**	-0.0037	0.0057	-0.0031	0.0075
	(0.0038)	(0.0081)	(0.0041)	(0.0166)	(0.0061)	(0.0122)	(0.0071)	(0.0279)	(0.0043)	(0.0089)	(0.0043)	(0.0166)
$E\text{-}Index_t$	-0.0009	0.0028			-0.0058**	-0.0002			0.0048**	0.0068**		
	(0.0017)	(0.0025)			(0.0027)	(0.0037)			(0.0019)	(0.0029)		
Excess $Dummy_t$ * $E\text{-}Index_t$		-0.0074**				-0.0114**				-0.0039		
		(0.0031)				(0.0048)				(0.0034)		
$G\text{-}Index_t$			0.0004	0.0021			-0.0017	0.0014			0.0024**	0.0029**
			(0.0009)	(0.0013)			(0.0016)	(0.0022)			(0.0009)	(0.0013)
Excess $Dummy_t$ * $G\text{-}Index_t$				-0.0034**				-0.0063**				-0.0011
				(0.0016)				(0.0028)				(0.0016)
Log (Q_{t-1})	-0.0109***	-0.0107***	-0.0082**	-0.0082**	-0.0196***	-0.0196***	-0.0130*	-0.0133**	0.0005	0.0006	-0.0018	-0.0018
	(0.0040)	(0.0040)	(0.0041)	(0.0041)	(0.0061)	(0.0061)	(0.0066)	(0.0066)	(0.0047)	(0.0047)	(0.0048)	(0.0048)
Log (ROA_{t-1})	0.0061	0.0060	0.0050	0.0050	0.0188**	0.0186**	0.0129	0.0132	-0.0072	-0.0072	-0.0058	-0.0058
	(0.0048)	(0.0048)	(0.0049)	(0.0049)	(0.0090)	(0.0089)	(0.0100)	(0.0100)	(0.0050)	(0.0050)	(0.0050)	(0.0050)
Log (Volatility)	0.0087	0.0084	0.0159*	0.0158*	0.0249*	0.0239*	0.0370**	0.0358**	-0.0030	-0.0030	0.0026	0.0027
	(0.0078)	(0.0078)	(0.0082)	(0.0082)	(0.0140)	(0.0140)	(0.0160)	(0.0160)	(0.0081)	(0.0081)	(0.0081)	(0.0081)
Log ($Sales_{t-1}$)	0.0137***	0.0137***	0.0145***	0.0146***	0.0123	0.0125	0.0138	0.0144	0.0118**	0.0117**	0.0125***	0.0124***
	(0.0046)	(0.0046)	(0.0047)	(0.0047)	(0.0079)	(0.0079)	(0.0089)	(0.0089)	(0.0047)	(0.0047)	(0.0045)	(0.0045)
Log ($Employees_{t-1}$)	-0.0117***	-0.0116***	-0.0101**	-0.0099**	-0.0132*	-0.0129*	-0.0113	-0.0110	-0.0092**	-0.0091**	-0.0079*	-0.0078*
	(0.0041)	(0.0041)	(0.0043)	(0.0043)	(0.0070)	(0.0070)	(0.0078)	(0.0078)	(0.0046)	(0.0045)	(0.0045)	(0.0045)
$R\&D_{t-1}/At_{t-1}$	0.2422***	0.2424***	0.3649***	0.3639***	0.3892***	0.3862***	0.6229***	0.6205***	0.0401	0.0406	0.0915	0.0907

Abnormal Return FF_{t+1}	1996-2006				1996-2001				2002-2006			
	(0.0844)	(0.0842)	(0.0959)	(0.0959)	(0.1220)	(0.1221)	(0.1506)	(0.1506)	(0.1058)	(0.1057)	(0.1039)	(0.1039)
Adv_{t-1}/At_{t-1}	-0.0248	-0.0229	0.0199	0.0201	-0.1153	-0.1096	-0.0699	-0.0680	0.0301	0.0298	0.0954	0.0940
	(0.0768)	(0.0766)	(0.0818)	(0.0817)	(0.0994)	(0.0994)	(0.1104)	(0.1102)	(0.1152)	(0.1152)	(0.1164)	(0.1165)
Log ($Leverage_{t-1}$)	-0.0012	-0.0013	-0.0006	-0.0006	-0.0018	-0.0020	-0.0002	-0.0004	-0.0003	-0.0003	-0.0006	-0.0006
	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0028)	(0.0028)	(0.0032)	(0.0032)	(0.0015)	(0.0015)	(0.0015)	(0.0015)
PPE_{t-1}/At_{t-1}	0.0390**	0.0382**	0.0342**	0.0333*	0.0335	0.0336	0.0308	0.0301	0.0369**	0.0361**	0.0326*	0.0323*
	(0.0160)	(0.0160)	(0.0171)	(0.0171)	(0.0261)	(0.0261)	(0.0305)	(0.0305)	(0.0175)	(0.0174)	(0.0171)	(0.0171)
Log ($Capx_{t-1}$)	-0.0018	-0.0018	-0.0049*	-0.0049*	-0.0027	-0.0026	-0.0073*	-0.0073*	0.0007	0.0008	-0.0016	-0.0016
	(0.0025)	(0.0025)	(0.0026)	(0.0026)	(0.0036)	(0.0036)	(0.0043)	(0.0043)	(0.0032)	(0.0032)	(0.0025)	(0.0025)
Log (AGE)	-0.0010	-0.0004	-0.0053	-0.0052	-0.0012	-0.0017	0.0037	0.0023	0.0145	0.0149	0.0049	0.0049
	(0.0153)	(0.0153)	(0.0164)	(0.0164)	(0.0259)	(0.0258)	(0.0296)	(0.0295)	(0.0156)	(0.0156)	(0.0161)	(0.0161)
Percentage CEO Equity	-0.0309	-0.0321	-0.0261	-0.0271	-0.0641	-0.0684	-0.0437	-0.0479	0.0175	0.0174	0.0052	0.0054
	(0.0486)	(0.0485)	(0.0496)	(0.0494)	(0.0783)	(0.0780)	(0.0865)	(0.0859)	(0.0584)	(0.0583)	(0.0561)	(0.0560)
Percentage Inside	0.0002	0.0002	0.0003	0.0003*	0.0003	0.0003	0.0004	0.0005	-0.0001	-0.0001	0.0000	0.0000
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Board Size	-0.0019*	-0.0019*	-0.0016	-0.0017	-0.0023	-0.0024	-0.0016	-0.0018	-0.0004	-0.0003	-0.0005	-0.0005
	(0.0010)	(0.0010)	(0.0011)	(0.0011)	(0.0016)	(0.0016)	(0.0019)	(0.0019)	(0.0012)	(0.0012)	(0.0012)	(0.0012)
Gender Dummy	-0.0127	-0.0125	-0.0132	-0.0136	-0.0089	-0.0092	-0.0109	-0.0125	-0.0118	-0.0117	-0.0144	-0.0144
	(0.0142)	(0.0143)	(0.0156)	(0.0157)	(0.0270)	(0.0275)	(0.0338)	(0.0343)	(0.0164)	(0.0164)	(0.0161)	(0.0161)
Duality	0.0052	0.0053	0.0047	0.0050	0.0044	0.0046	0.0024	0.0028	0.0024	0.0024	0.0028	0.0030
	(0.0045)	(0.0045)	(0.0048)	(0.0048)	(0.0077)	(0.0077)	(0.0089)	(0.0089)	(0.0049)	(0.0049)	(0.0049)	(0.0049)
Log (Number of Board Meetings)	-0.0044	-0.0049	-0.0041	-0.0049	-0.0052	-0.0061	-0.0053	-0.0074	-0.0030	-0.0033	-0.0034	-0.0036
	(0.0060)	(0.0060)	(0.0063)	(0.0064)	(0.0100)	(0.0100)	(0.0115)	(0.0115)	(0.0065)	(0.0065)	(0.0067)	(0.0067)

Abnormal Return FF_{t+1}	1996-2006				1996-2001				2002-2006			
Internal CEO	0.0016 (0.0045)	0.0017 (0.0045)	-0.0011 (0.0048)	-0.0009 (0.0048)	0.0066 (0.0082)	0.0072 (0.0082)	-0.0006 (0.0093)	-0.0005 (0.0093)	-0.0035 (0.0047)	-0.0035 (0.0047)	-0.0018 (0.0049)	-0.0018 (0.0049)
Intercept	-1.3430*** (0.0710)	-1.3532*** (0.0712)	-1.2811*** (0.0762)	-1.2943*** (0.0768)	-1.5088*** (0.1192)	-1.5211*** (0.1194)	-1.4974*** (0.1381)	-1.5167*** (0.1389)	-1.1953*** (0.0730)	-1.1998*** (0.0731)	-1.1422*** (0.0757)	-1.1463*** (0.0759)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Sq	0.0129	0.0137	0.0173	0.0179	0.0333	0.0346	0.0466	0.0482	0.0149	0.0150	0.0120	0.0118
Number of Observations	6721	6721	6227	6227	3440	3440	2865	2865	3281	3281	3362	3362

Table 8 examines the impact of director excess compensation on the entrenchment-performance relationship during the whole sample period (1996-2006), in addition to the 2 sub-periods (1996-2001 and 2002-2006). The dependent variable is the firm's abnormal return, measured following the Fama-French (1993) 3-factor model, at time t+1. During each sample period, an excess compensation dummy variable is defined to be equal to 1 if director excess compensation is greater than the mean excess compensation during that period and 0 otherwise. We proxy for managerial entrenchment at time t using both the E-index and the G-index. We include all the variables that were hypothesized to explain director total compensation as control variables. Industry and year dummies are included to control for industry and year specific characteristics. We define industry based on Fama and French 48-industry definition. Table 1 provides detailed information on all variables. Robust standard errors are computed following White (1980) to account for any possible heteroskedasticity. Standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

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ESSAY 2: BOARD COMPOSITION, CEO TURNOVER, AND FIRM VALUE: THE EFFECT OF THE SARBANES-OXLEY ACT

1. Introduction

Do firms choose the composition of their board of directors such that they are in equilibrium? Does the regulation of board structure help improve board efficiency? How does the imposition of board regulations affect the firms' performance? This article attempts to answer these questions by examining a unique event whereby firms experience an exogenous shock regarding the minimum participation of independent directors on the board. That is, we investigate whether the regulation of board structure enhanced the efficiency and effectiveness of internal monitoring. Often times imposing such regulations may not be optimal. That is, the benefits of increased independence might not outweigh its costs. Moreover, the firm characteristics and monitoring needs are neither homogenous across firms nor constant over time. Accordingly, the imposition of a unified regulation on all firms may not be economically efficient.

An advantage of having insiders as members of the board of directors is that insiders have more specific information about the firm. Inside directors are more informed, and thus can make better decisions concerning the operations of the firm.[18] Since outside directors lack firm-specific information, there are costs associated with transforming their knowledge and experience to fit a certain firm.[19] In general, adding independent directors to the board raises the costs associated

[18] Vance (1964) suggests a positive association between the percentage of insiders serving on the board and firm performance.
[19] Raheja (2005) presents a theoretical model to study the tradeoff between inside and outside directors. The author suggests that as the cost of monitoring increases, the number of outsiders decrease. Moreover, Raheja (2005) proposes that when there is an alignment between the objectives of shareholders and managers, boards are generally smaller. Whereas Klein (1998) reports no significant relationship between board committees' independence and firm performance, the author argues that insiders' participation on the board's investment committee has a positive effect on firm performance.

with coordination, information asymmetry, and free-rider problems. Maug (1997) suggests that monitoring costs for firms with high information asymmetry might outweigh the benefits of monitoring. In such a case, adding independent directors to the board might not be optimal for the firm. On the other hand, even though they are less informed about the firm operations, independent directors are expected to offer more effective and efficient monitoring (Fama and Jensen (1983); Weisbach (1988); Borokhovich, Parrino, and Trapani (1996)). Fama and Jensen (1983) suggest that outsiders provide better internal monitoring than insiders due to their reputation concerns.[20] Weisbach (1988) proposes that, since insiders are less likely to confront the CEO and challenge his/her decisions, outsiders are more effective in monitoring the firm's management. Borokhovich et al. (1996) document a direct relationship between outside directors and the likelihood of replacing a dismissed CEO with an outsider.[21] In general, there is mixed evidence concerning the effect of increased independence on the firm's governance structure and performance.

This paper adds to the growing body of literature studying the Sarbanes-Oxley Act (SOX) of 2002 and its effect on the firm's governance and control mechanisms. We complement the existing literature by documenting the impact of changes in board composition on monitoring, turnover, and firm value. The current paper breaks from the existing literature by showing that an increase in the percentage of independent directors leads to a significant reduction in CEO turnover and the turnover-performance sensitivity. We also highlight a converse impact on firm value due to the changes in board structure. Our findings rely on an off equilibrium result whereby firms are forced to deviate from their endogenously chosen board structure.

[20] Outside directors are generally employed by other firms and, thus, rely on multiple firms for income.
[21] Borokhovich et al. (1996) highlight a positive market reaction to the appointment of an outsider as the firm's CEO.

We test the time period of four years before and after the passage of SOX to show that an exogenous requirement to increase the percentage of independent directors represents a shift away from the endogenously chosen equilibrium levels of board composition. Linck, Netter, and Yang (2009) show that, following the passage of SOX and the adoption of the NYSE/NASDAQ regulations, the boards of directors of publicly traded corporations in the United States became larger and consisted of a greater percentage of independent directors. In this paper, we verify the increase in the percentage of independent directors following SOX. The passage of this legislation had a significant impact on board composition and forced a shift away from the previously established equilibrium. Linck et al. (2009) suggest that if boards exacerbate agency problems such as moral hazards and adverse selection, regulatory mandates may be beneficial to shareholders. Alternatively, if regulations force firms toward an inefficient board structure, these mandates may impose deadweight costs on firms and their shareholders. In addition, we argue that if the regulation falls short of the intended objective and can be exploited by the CEO, this might lead to weaker governance and more expropriation of the shareholders' wealth. Goldman and Slezak (2006) show that although policies and regulations are implemented to decrease manipulation, they might have an unforeseen converse effect and, thus, lead to an increase in manipulation and fraudulent activities.

Our findings suggest that the participation of independent directors increases significantly after the passage of SOX. We show that this increase in independence came at the expense of insiders and grey directors. Chhaorchharia and Grinstein (2009) find that, in non-complying firms, the average number of independent directors arriving post SOX was 1.31 while the average number of independent directors leaving post SOX was 0.34 for a net increase of one independent director per firm. Additionally, they find that on average 0.38 and 0.37 employee and linked directors left the firm post SOX. This shift entails a trade-off between the contribution of insiders who possess valuable firm specific experience and information, and the additional internal control and monitoring that independent directors are expected to provide. More efficient monitoring and better governance is what the legislators hoped to achieve by implementing SOX.

One of the major responsibilities of board members is to monitor the manager's actions and behavior. That is, the board of directors is expected to help maximize shareholders' wealth by ensuring the appropriateness, dedication, honesty, and transparency of the firm's management. Consequently, directors make the crucial decision of dismissing ineffective, inappropriate, or fraudulent managers. In this paper, we investigate whether the change in board structure enhances the soundness of the firm's governance structure. Therefore, we focus on the impact of increased independence on CEO turnover, which is a direct consequence or measure of the quality of internal monitoring (Huson, Parrino, and Starks (2001)). Weisbach (1988) and Perry (2000) show that boards dominated by independent directors are more likely to remove a CEO based on poor firm performance than boards dominated by insiders.

In contrast to the existing literature on the direct relationship between board independence and CEO turnover, our findings suggest a significant drop in the likelihood of managerial turnover in the post-SOX period. While it is tempting to attribute such a decline in turnover to the better alignment of interests between management and shareholders, our results show just the opposite. This paper suggests that while better firm performance leads to lower CEO turnover irrespective of board composition, boards dominated by independent directors are less likely to terminate a CEO contract because of poor performance in the post-SOX period. Moreover, we show that the increase in the participation of independent directors leads to a lower probability of CEO turnover. Back-scratching and socialization between the CEO and the directors, especially the CEO appointed independent directors, might be a reasonable explanation for the obtained results. The need to comply with SOX, regarding board composition, might have provided a good opportunity for CEOs to appoint independent directors, who are not effective monitors, but will rather accommodate the CEO's decisions. That is, SOX may have given the CEO an opportunity to increase his/her authority and job security. These results are consistent with the findings of Crystal (1991), Lambert et al. (1993), and Boyd (1994). Crystal (1991) proposes that independent directors, who are appointed by the CEO, are less likely to vote against CEO recommendations. Lambert et al. (1993) and Boyd (1994) find evidence on a direct correlation between CEO compensation and board independence.

We also show that the change in board composition has a negative impact on firm performance. During the post-SOX era, our findings suggest a negative and significant association between board independence and firm performance. On the other hand, we find that insiders' participation has a direct effect on performance. In addition, whereas the upward change in board independence brings about a converse change in firm value, the drop in insiders' participation leads to a reduction in firm value. This signals the importance of insiders in improving firm performance during the post-SOX period. Insiders are more informed about firm operations whereas independent directors are expected to upgrade the internal control mechanism. Consequently, substituting independent directors for insiders entails a trade-off that might be costly to shareholders, especially if independent directors fail to provide the intended additional monitoring.

The rest of the paper is organized as follows. Section 2 reviews the literature. Section 3 describes the data and presents descriptive statistics. Sections 4 and 5 empirically test the impact of the regulatory requirements on board composition and, consequently, the implications on CEO turnover and firm value. Section 6 concludes.

2. Literature Review

Empirical findings in corporate governance must be holistically evaluated as seen by Hermalin and Weisbach (1998), who suggest that there may be some extraneous factor causing equilibrium or alternatively the findings may represent out-of-equilibrium phenomena. In either case, the policy procedures or corrections are very different. Hermalin and Weisbach (1998) insist that a board of directors exists not merely because of regulatory mandates but that there must be some added value. Linck, Netter, and Yang (2008) propose that a board may arise as a result of agency problems, rather than as a solution. It may however be hard to evaluate empirical findings because of the endogeneity surrounding board composition as a response to the firm's internal environment.

The search for a control mechanism, internal or external, to align the objectives of management and shareholders receives a lot of attention from academic researchers, practitioners, and policy makers as well. Several studies contend that the existing internal control provided by the board of directors provides a reasonable mechanism to make it more difficult for managers to deviate from shareholders' objectives. The added value of independent directors has been advanced by Fama (1980) and Weisbach (1988). Fama (1980) argues that the likelihood of expropriating shareholders' wealth, by management, is negatively related to the percentage of independent directors. Weisbach (1988) suggests that an insider dominated board is less likely to remove a CEO due to poor performance than an outsider dominated board. In addition, Perry (2000) documents a positive relation between independent directors and effective board monitoring. The author finds no significant relation between board composition and CEO turnover for reasons other than performance. However, a board dominated by independent directors is more likely to vote for CEO removal after the firm's poor performance.

Following the fraudulent business scandals of Enron, Adelphia, Tyco, and WorldCom in the early 2000's, Congress enacted the Sarbanes Oxley Act in 2002. SOX makes it harder for managers to manipulate the content of their financial statements and engage in fraudulent activities. The act is intended to increase the amount of monitoring on managers' behavior by encouraging the independence of board committees, improving transparency, and increasing the penalties for deceitful activities. In addition, the NYSE/NASDAQ compositional regulatory requirements, as of 2003, impose that the majority of directors be classified as independent. Imposing such a requirement may not be economically efficient. For efficiency, the benefit due to increased monitoring that comes with greater independence must outweigh or at least be equal to the costs of monitoring and the inherent free-rider problem.

Linck, Netter, and Yang (2009) and Gordon (2007) highlight the presence of an upward trend in the percentage of independent directors before SOX. Gordon (2007) attributes this to firms focusing more on maximizing the value of the firm. Linck, Netter, and Yang (2009) show that the increase in the percentage of independent directors hastened after SOX. They provide evidence that, following SOX and the regulations by the NYSE and NASDAQ, the number of members on the board of directors of U.S. firms increased. They also suggest that boards are composed of more outside directors and that board members experience an increase in workload and risk after SOX. Overall, boards are larger and more independent in the post-SOX era.

Extant literature is split between two opposing viewpoints on the merit of board composition affecting firm value; it may be the case that the ever changing makeup of the corporate landscape allows for both findings. Furthermore it may be the case that both findings exist simultaneously due to the issues of endogeneity and diminishing marginal efficiency of independence. The latter is theoretically viable because the marginal benefits associated with monitoring decrease as free riding and asymmetric information increases. Both costs increase as the number of members serving on the board increase.

Several studies investigate the effect of board composition on firm value. Much of the research has shown no significant relationship between the percentage of outsiders on the board and contemporaneous measures of corporate performance (Baysinger and Butler (1985); Hermalin and Weisbach (1991); Mehran (1995); Klein (1998); Bhagat and Black (1999)). However, Bhagat and Bolton (2008) find a negative correlation between board independence and industry adjusted Tobin's Q. On the contrary, Rosenstein and Wyatt (1990) find a positive and significant reaction in stock price following the announcement of a new independent director. Additional evidence for a positive relationship includes the findings of Nguyen and Nielsen (2010), who find a drop in stock price following the death of an independent director.

The existent literature offers several instances whereby the fraternal relationship between the CEO and the board directors may be suboptimal. In general, the CEO may also serve as the chair of the board; thus exerting significant influence over the board. Crystal (1991) proposes that since the CEO is generally responsible for hiring and removing the outside directors, the board of directors is not successful in providing the CEO with the proper levels of compensation. In such a case, outside directors will be reluctant to opposing the CEO’s decisions. Lambert et al. (1993) and Boyd (1994) show that CEO compensation increases with the proportion of outside directors on the board. Moreover, they show that there is a positive relation between CEO compensation and the percentage of the board that is appointed by the CEO.

Jensen (1993) suggests that the board of directors might not be successful in providing efficient and effective monitoring. He argues that the culture of the board of directors might prevent constructive criticism. Moreover, board members might put more weight on politeness and back scratching instead of truthfulness and honesty. In such a case, poor monitoring leads to exaggerated compensation for the CEO. Brick et al. (2006) refer to this "mutual back scratching" phenomenon as "cronyism". Brick et al. (2006) show that there is a positive relation between CEO and director compensation.

3. Sample and Data

3.1 Data and Methodology

The sample consists of firms for which sufficient data exists on the COMPUSTAT, CRSP, ExecuComp, and RiskMetrics databases. The time period spans four years prior and post the adoption of SOX in 2002.

ExecuComp data is utilized to identify CEO turnover. **Turnover** is a dummy variable that takes the value of 1 if a CEO turnover is documented and 0 otherwise. Firms are said to be complying with the board composition requirement if at least 50% of its board members are independent directors in a given year. **IndepDummy** is an independent dummy variable that takes the value of 1 if the percentage of independent directors is greater than 50% and 0 otherwise.

The firm's abnormal returns are calculated to measure performance. Abnormal returns are computed based on the Fama-French (1993) 3-factor model. Therefore, for each firm i in a given year t, we employ the following regression model:

$$r_{id} - r_{fd} = \alpha_i + \beta(r_{Md} - r_{fd}) + sSMB_d + hHML_d + \varepsilon_{id} \quad \text{(Equation 1)}$$

where the intercept (α_i) represents the firm's abnormal return r_{id} is the return of firm i in day d in a certain year. r_{fd} is the simple daily T-bill rate. r_{Md}- r_{fd}, SMB_d, and HML_d denote the market risk premium, size factor, and book-to-market factor, respectively. We obtain the daily data on these factors from Ken French's website.

In the post-SOX period, we examine the impact of the changes in board composition on CEO turnover and the change in firm value. Therefore, we calculate the following:

$$ChangeIndependent_{ia} = Independent_{ia} - MeanIndependent_{ib} \quad \text{(Equation 2)}$$

$$ChangeInside_{ia} = Inside_{ia} - MeanInside_{ib} \quad \text{(Equation 3)}$$

$$ChangeGrey_{ia} = Grey_{ia} - MeanGrey_{ib} \quad \text{(Equation 4)}$$

$$ChangeAR_{ia} = AR_{ia} - MeanAR_{ib} \quad \text{(Equation 5)}$$

where i = 1, 2,…,n refers to firm i and a = 2003,…,2006 refers to the post-SOX period. The subscript b refers to the period before the passage of SOX. For example, **$Independent_{ia}$** is the percentage of independent directors for firm i in year a. **$MeanIndependent_{ib}$** is the mean percentage of independent directors for firm i during the pre-SOX period. Therefore, we calculate the mean percentage of independent directors for each firm in the pre-SOX period and use it as a benchmark. Then, we subtract each firm's mean percentage of independent directors in the pre-SOX period from the percentage of independent directors for each firm during a given post-SOX year. Similarly, we compute the change in the percentage of insiders, the change in the percentage of grey directors, and the change in the firm value.

The control variables used in this research regarding firm, governance, and CEO characteristics are consistent with the existing literature on board composition, managerial turnover, and firm performance (Weisbach (1988); Warner, Watts, and Wruck (1988); Rosenstein and Wyatt (1990); Yermack (1996); Denis, Denis, and Sarin (1997); Perry (2000); Goyal and Park (2002); Bhagat and Bolton (2008); Linck, Netter, and Yang (2008); Linck, Netter, and Yang (2009); Lehn, Patro, and Zhao (2009), Guo and Masulis (2010)). Detailed information on all variables is provided in Table 9. Industry fixed effects are used to control for industry unobserved specifics. We define industry based on Fama-French (1997) industry definition. To control for any possible heteroskedasticity, we utilize White (1980) robust standard errors.

3.2 Descriptive Statistics

Table 10 Panel A presents a comparison between the pre-SOX and the post-SOX eras regarding the percentage of non-complying firms. Firms are said to be in compliance if more than 50% of its board members are independent directors.

Due to the passage of the SOX and the regulations enforced by NYSE and NASDAQ, we expect an increase in the percentage of complying firms following SOX. Table 10 Panel A shows that, on average, 28.75% of firms were non-complying in the pre-SOX era. However, as expected, the mean percentage of non-complying firms drops to only 11.53% following SOX. These levels of compliance (noncompliance) in the pre (post) SOX era are consistent with the findings of Chhaochharia and Grinstein (2009) and a working paper by Guo and Masulis

(2010).[22] Although the largest jump in compliance occurs between 2002 and 2003 there is still a significant amount of noncompliance in the post SOX era and after the NYSE and NASDAQ adopted the new listing requirements. Chhaochharia and Grinstein (2009) attribute this discrepancy to a difference in the definition of 'independent' applied by the exchanges and RiskMetrics. NYSE and NASDAQ classify a former employee of the firm as independent if at least three years has passed since their employment ended. RiskMetrics, on the other hand, never classifies a former employee as independent. Additionally, the NYSE and NASDAQ allow for certain business relationships to be deemed "insignificant" provided they do not exceed a certain payment threshold, whereas RiskMetrics may consider these directors linked. Finally, the NYSE and NASDAQ provide an exemption to the rules for controlled companies, those that have at least 50% of the voting power held by one owner, group, or corporation. In such cases the companies need not comply with the listing requirements regarding independent directors.

In Table 10 Panel B, we provide descriptive statistics on board composition in the two periods before and after the implementation of the SOX. The results show a significant increase in the percentage of independent directors following the passage of SOX. In the pre-SOX period, the mean percentage of independent directors is 62.448%. On the other hand, the mean percentage of independent directors increases to 70.633% in the post-SOX period. This is consistent with the findings of Linck et al. (2009) who highlight an increase in the percentage of independent directors following SOX. The results suggest that, in the post-SOX period, firms increase the number of independent directors serving on their boards at the expense of insiders

[22] Guo and Masulis (2010) show that firms which were obliged to comply with the SOX and NYSE/NASDAQ regulations experience an improvement in monitoring relative to firms which were already in compliance with the regulations.

and grey directors. We document a significant reduction in the percentage of insiders and grey directors following the passage of SOX.

4. Board Composition, Monitoring, and Turnover

4.1 Board Composition and SOX

One might argue that the documented change in board composition during the post-SOX period might be due to factors other than the passage of SOX. That is, other factors, such as the need for monitoring, might have led firms to increase the participation of independent directors. Table 11 presents a regression of the percentage of the three types of directors on the SOX dummy variable and various control variables. That is, all else equal, we document the variation in board composition due to the implementation of SOX. The results confirm the findings of Table 10 Panel B. The post-SOX period experienced an increase in the percentage of independent directors, while the representation of non-independent directors went down. That is, the increase in the participation of independent directors came at the expense of a lower participation by insiders and grey directors.

The results suggest a positive relation between firm size and independence. Therefore, consistent with Fama and Jensen (1983), monitoring costs increase as the firm becomes more complex. If independent directors are effective internal monitors, one would expect the CEO, who is also the chair of the board, to prefer lower levels of monitoring. Thus, he/she would appoint fewer independent directors. Hermalin and Weisbach (1998) propose a negative relation between independence and the CEOs power and control. Interestingly, we find that the percentage of independent directors is higher when the CEO serves as the chair of the board. Moreover, a negative relation is found between duality and both types of non-independent directors. Since the CEO is generally responsible for hiring independent directors, his/her preference for more independent directors signals ineffective monitoring and the possibility of back scratching between the CEO and independent directors. This is consistent with several previous research findings (Crystal (1991); Lambert et al. (1993); Boyd (1994)). We find a positive association between CEO total compensation and board independence. Also, the firm is expected to require higher levels of monitoring when the firm risk is higher (Bryan et al. (2000) and Brick et al. (2006)). However, our findings suggest a negative and significant relation between firm volatility and the percentage of independent directors.

4.2 CEO Turnover and SOX

In this section, we investigate the impact of increased independence on CEO turnover. The appreciation in the percentage of independent directors following SOX may improve the efficiency and effectiveness of internal monitoring. In such a case, the manager is subject to more pressure as he/she is held more accountable for firm performance. In Table 12, a probit model is utilized to study the impact of SOX on CEO turnover. The results highlight a significant reduction in the probability of CEO turnover after SOX. This suggests that, in the post-SOX period, managers experience less pressure since the prospect of losing their jobs is lower. Therefore, SOX might not have been successful in monitoring the managers. The increase in independent directors might have provided CEOs with more protection. Mutual back scratching and socialization at the top, rather than the better alignment of owners and managers objectives, might have led to the lower turnover probability.

Table 12 also suggests that firm size has a positive impact on CEO turnover. This is consistent with the findings of Huson, Parino, and Starks (2001). ROA, which measures the firm's accounting performance, has an inverse and significant relation with turnover. Warner, Watts, and Wruck (1988), among others, suggest similar results. Contrary to Yermack (1996), we observe a direct association between board size and CEO turnover. As expected, we demonstrate a negative relation between turnover and duality. When the CEO is also the chair of the board, he/she has more power and control over the decisions and actions of the board. This would in turn diminish the probability of CEO turnover.

4.3 Impact of Independence on the Turnover-Performance Sensitivity

An alternative hypothesis may suggest that the drop in CEO turnover following SOX is the outcome of the better alignment of interests between the CEO and the firm owners. That is, SOX increases the soundness of the firm's governance structure and manages to better align the shareholders' and management objectives. Consequently, this might reduce the need for managerial turnover.

Accordingly, we investigate the impact of board independence on the turnover-performance sensitivity during the pre-SOX and post-SOX periods. This helps differentiate whether the reduction in turnover probability following SOX is due to inefficient monitoring or better alignment of interests between owners and management. Consistent with Perry (2000) and Huson, Parino, and Starks (2001), we use both accounting and market performance measures in our analysis of the effect of independence on the turnover-performance sensitivity. Weisbach (1988) and Perry (2000) suggest that boards dominated by independent directors are more likely to remove a CEO based on poor performance.

Table 13, columns 1 and 3, presents a regression of Turnover on the independence dummy variable (IndepDummy), ROA (as a measure of accounting performance), and various control variables. We show that the relation between independence and turnover switches in sign following SOX. The relation between the independence dummy variable and turnover is positive prior to SOX. However, in the post-SOX period, the relation is negative. While the relation between the independence dummy variable and turnover is not statistically significant during both periods, the difference between both coefficient estimates is statistically significant at the 10% level of significance, using a t-test. The results also suggest that the post-SOX turnover-performance sensitivity is not significantly different than the pre-SOX turnover-performance sensitivity.[23] That is, in both periods, poor performance increases the likelihood of CEO turnover. Therefore, following SOX, the manager is not subject to an additional pressure of losing his/her job because of poor performance.

In columns 2 and 4, we interact the return on assets with the independent dummy variable to examine the effect of independence on the turnover-performance sensitivity. During the pre and post SOX periods, the relation between performance and turnover is negative and significant when the percentage of independent directors is less than or equal to 50%. Contrary to the findings of Weisbach (1988) and Perry (2000), in both periods, high board independence does not increase the likelihood of performance related CEO dismissals. Therefore, board independence does not seem to impose additional pressure on the manager to enhance his/her performance. Surprisingly, the coefficient estimate for the independence-performance interaction variable is positive and significant in the post-SOX period. This suggests that board independence reduces the turnover-performance sensitivity following SOX. Therefore, boards dominated by independent directors are less likely to remove a CEO due to poor firm

[23] A t-test is used to test whether the turnover-performance sensitivity is significantly different between both periods, before and after SOX.

performance, as compared to boards dominated by non-independent directors. These results suggest that the increase in independent directors following SOX does not lead to more efficient monitoring and better governance. Instead, back-scratching, socialization, and other forms of collusion between the CEO and the CEO influenced independent directors might explain the lower job security pressure on CEOs subsequent to SOX.

Using the one period lagged risk adjusted returns to proxy for the firm's market performance, Table 14 examines the effect of independence on the turnover-market performance sensitivity. Risk adjusted returns are computed following the Fama-French (1993) 3-factor model. In general, our findings in columns 1 and 3 are very much like those reported in Table 13. However, during the post-SOX period, the inverse relation between abnormal returns and managerial turnover is not significant. Thus, we do not find significant evidence suggesting that managers are dismissed due to poor stock market performance following SOX. During both the pre-SOX and post-SOX periods, columns 2 and 4 document that the turnover-market performance sensitivity is not significant when boards are not dominated by independent directors. As for the independence-performance interaction variable, our results demonstrate a change in the sign of the coefficient estimates during the post-SOX period. Whereas the coefficient estimate of the independence-performance interaction variable is negative prior to SOX, it switches to positive following the passage of SOX. Both coefficient estimates are, however, not significant. Accordingly, these findings suggest that the increased participation of independent directors does not imply an appreciation in the likelihood of performance related managerial turnover. The increased participation of independent directors does not seem to improve the firm's internal monitoring.

4.4 Changes in Board Composition and CEO Turnover

We now examine the effect of the changes in board composition on CEO turnover following the passage of the SOX. Table 15 presents a probit model whereby CEO turnover is regressed on the post-SOX change in the percentage of the three different groups of directors. Table 15 documents an inverse relationship between the change in the percentage of independent directors and CEO Turnover. That is, the increase in the percentage of independent directors, in the post-SOX period, reduces the pressure on the CEO in terms of his/her job security. The relation between the percentage of inside directors and CEO turnover is positive but insignificant. As for grey directors, we observe a positive and significant relation between the change in the percentage of grey directors and turnover. That is, a decrease in the percentage of grey directors reduces the probability of CEO turnover.

The results follow the same trend established in earlier sections. The hypothesis which associates the reduction in CEO turnover following SOX with better governance is refuted. On the contrary, the lower CEO turnover associated with the positive change in the percentage of independent directors suggests weaker corporate governance. Thus, board composition changes might have given the manager the opportunity to increase the percentage of CEO influenced independent directors and, thus, gain more control over the board and achieve higher job security. Our findings are consistent with several previous studies examining the relation between the CEO and the outside directors (Crystal (1991); Lambert et al. (1993); Boyd (1994)). These papers suggest that the board of directors might not be successful in providing the CEO with proper levels of compensation since the CEO is generally responsible for hiring and removing the outside directors. Hermalin and Weisbach (1998) argue that directors are generally reluctant to oppose the CEO's decisions as he/she control their appointments. In such a case, directors may not be efficient and effective in monitoring the CEO's actions and behavior.

5. Board Composition and Firm Performance

In this section, we study how firm value is affected by board structure changes. In Table 16, we regress the firm's risk-adjusted returns on the percentage of the three different types of board directors during both the pre and post SOX periods. During 1998-2001, Table 16 suggests that, though insignificant, the coefficient estimates of independence and insiders' participation have opposite signs. While the coefficient estimate for the percentage of independent directors is positive, the coefficient estimate for the percentage of inside directors is negative. Regulatory requirements were intended to improve the firms' governance structure by promoting board independence. However, our findings demonstrate that the regulators may not have been successful in accomplishing their objectives. During the post-SOX era, we highlight a negative and significant association between board independence and firm performance. In addition, we demonstrate that insiders' participation has a significantly positive effect on firm performance. Thus, despite the good intentions of legislators to protect shareholders, the trend towards increased independence has converse implications on shareholders' wealth.

Table 16 also highlights a change in the sign of the relation between leverage and firm performance during the post-SOX period. In general, the literature provides mixed evidence on the effect of leverage on firm value. During the pre-SOX period, consistent with Yermack (1996), we find an inverse relation between board size and firm value. In addition, our results propose that an increase in CEO age brings about a deterioration in the firm's performance. The evidence suggests a positive association between the firm's risk and its abnormal returns.

We also investigate, in the post-SOX period, the effect of board composition changes on firm performance. That is, we study the relation between firm value and the change in the percentage of the three different groups of directors. If the increase in independence leads to more efficient monitoring and better governance, we expect the change in board composition to help improve firm performance, other things being equal. On the other hand, in line with our previous results, if the legislation leads to inefficient monitoring and forces firms away from their endogenously determined equilibrium, we anticipate a negative association between independence and firm value.

Table 17 presents the results of regressing firm performance on the change in independence, change in insider participation, change in the percentage of grey directors, and various control variables. The results demonstrate an inverse association between the change in board independence and firm value. Moreover, our findings document a positive and significant relation between the change in the percentage of insiders and firm performance. That is, the reduction in the participation of insiders in the post-SOX era leads to a reduction in shareholders' wealth.[24]

The results emphasize that an increase in the percentage of independent directors, which came at the expense of inside and grey directors, adversely affects firm performance. This is consistent with our previous findings that board structure changes do not lead to better governance and more efficient monitoring. Furthermore, in the post-SOX period, the reduction in the percentage of inside directors seems to have an adverse effect on shareholders. Insiders seem to possess invaluable information and expertise concerning firm-specific operations. On the other hand, independent directors may lack the necessary experience and information about the firm.

[24] We obtain similar results when using the change in risk adjusted return (ChangeAR) as the dependent variable.

The problem of replacing insiders by independent directors is aggravated when independent directors fail to provide more efficient monitoring and better governance.

6. Conclusion

This paper adds to the intellectual debate on the efficacy of corporate boards as a monitoring mechanism by studying the consequences of the SOX legislation and the subsequent changes to the NYSE/NASDAQ listing requirements. Consequently, we also examine the implications of board structure changes on CEO turnover and firm value. Therefore, we focus on a specific period in which there is an exogenous shift from the general market equilibrium to one with imposed regulation.

Our findings document a boost in the participation of independent directors following SOX. This comes at the expense of a reduction in the percentage of insiders serving on the board. We also document a drop in CEO turnover during the post-SOX period. We suggest that such a decline in turnover is not due to better governance and control. Instead, the increase in independent directors has a negative impact on the turnover-performance sensitivity. Moreover, in the post-SOX period, we demonstrate that the increase in board independence has an adverse effect on the likelihood of managerial turnover. Therefore, contrary to the legislators' objectives, our results suggest that the increase in independent directors reduces monitoring efficiency and the soundness of the governance structure. The passage of SOX may have presented an opportunity for the CEO to appoint new "independent" directors. These newly-appointed directors might be influenced by the CEO and be willing to accommodate his/her actions and decisions. This new environment offers the CEO more protection and greater job security.

Furthermore, this study examines the impact of board composition changes on firm value. We show that firm value is conversely affected by board structure changes. This article documents that higher independence and lower involvement of insiders on the board have a negative effect on firm performance during the post-SOX period. This suggests that the change in board structure may have led to an unfavorable and costly trade-off between independent directors and the more informed inside directors.

Following the exogenous increase in board independence, firms appear to employ independent directors at a level greater than optimal. Our results suggest that forcing firms away from their endogenously determined board structures has a negative effect on the shareholders' interests and wealth.

Tables

Table 9. Variable Definitions

Variable	Variable Definition
Firm Size$_{t-1}$	The natural logarithm of Total Assets in time t-1.
Sales$_{t-1}$/At$_{t-1}$	The ratio of Sales to Total Assets in time t-1.
Capx$_{t-1}$/At$_{t-1}$	The ratio of Capital Expenditures to Total Assets in time t-1.
Leverage$_{t-1}$	The ratio of long term Debt to Total Assets in time t-1
Liquidity$_{t-1}$	The difference between Current Assets and Current Liabilities divided by Total Assets in time t-1
ROA $_{t-1}$	The ratio of Income Before Extraordinary Items to Total Assets in time t-1
Board Size	The total number of board members in a given year.
CEO Age	The CEO's Age
Duality	A dummy variable equal to 1 if the CEO is also the chair of the board of directors and 0 otherwise.
CEO Total Compensation	CEO total compensation is calculated by adding the CEO’s salary, bonus, the Black-Scholes value of options granted, the value of restricted stock granted, long-term incentive payouts, other annual and all other total compensation. The natural logarithm of CEO total compensation is used.
Volatility	The Black-Scholes volatility measure. The natural logarithm of volatility is used.
Sox	A dummy variable that takes the value of 1 in the post-SOX period and 0 otherwise.
AR FF	The firm’s abnormal return is computed following the Fama-French (1993) 3-factor model.
Turnover	A dummy variable equal to 1 if a CEO turnover is documented in a given year or 0 otherwise.
Independent	The percentage of independent directors serving on the board. Directors are identified as independent based on the RiskMetrics classification.

Variable	Variable Definition
Inside	The percentage of inside directors serving on the board. Directors are identified as insiders based on the RiskMetrics classification.
Grey	The percentage of grey directors serving on the board. Directors are identified as grey based on the RiskMetrics classification.
IndepDummy	An independent dummy variable that takes the value of 1 if the percentage of independent directors is greater than 50% and 0 otherwise.
ChangeIndependent	The change in the percentage of independent directors in a given post-SOX year is calculated as the percentage of independent directors less the mean percentage of independent directors for that firm during the pre-SOX period.
ChangeInside	The change in the percentage of insiders in a given post-SOX year is calculated as the percentage of insiders less the mean percentage of insiders for that firm during the pre-SOX period.
ChangeGrey	The change in the percentage of grey directors in a given post-SOX year is calculated as the percentage of grey directors less the mean percentage of grey directors for that firm during the pre-SOX period.
ChangeAR	The change in firm value in a given post-SOX year is calculated as industry adjusted Tobin's Q less the mean industry adjusted Tobin's Q for that firm during the pre-SOX period.

Table 10. Descriptive Statistics

Panel A

Period	Number of Complying Firms	Number of Non-Complying Firms	Total Number of Firms	Percentage of Non-Complying Firms
Pre-SOX	974	393	1367	28.75%
Post-SOX	1189	155	1344	11.53%

Panel B

	Pre-SOX		Post-SOX	
Variable	Mean	Median	Mean	Median
Independent	62.448	66.667	70.633[a]	71.429[b]
Inside	22.121	20.000	17.876[a]	14.286[b]
Grey	15.431	12.500	11.484[a]	10.000[b]

Table 10 Panel A presents the percentage of complying and non-complying firms for the 2 periods: Pre-SOX and Post-SOX. Complying firms are those firms in which the percentage of independent directors is greater or equal to 50%. Non-complying firms are those firms in which the percentage of independent directors is less than 50%. Table 10 Panel B presents descriptive statistics on the composition of the board of directors during the pre and post SOX periods. The superscript (a) denotes that the difference in means between the 2 samples is statistically significant at the 1% level, using a t-test. The superscript (b) suggests that the difference in medians between the 2 samples is statistically significant at the 1% level, using the Wilcoxon-Mann-Whitney test.

Table 11. Board Composition and SOX

	Independent	Inside	Grey
Sox	7.7642*** (0.3538)	-4.0698*** (0.2289)	-3.6966*** (0.3038)
Firm Size$_{t-1}$	1.2132*** (0.1918)	-0.3156** (0.1251)	-0.8973*** (0.1527)
Sales$_{t-1}$/AT$_{t-1}$	0.8360*** (0.3040)	-0.8248*** (0.2089)	-0.0132 (0.2604)
Capx$_{t-1}$/AT$_{t-1}$	-7.5708* (4.1496)	14.4145*** (2.8538)	-6.8456** (3.4673)
Leverage$_{t-1}$	3.1721** (1.3194)	-4.2110*** (0.8438)	1.0436 (1.1468)
Liquidity$_{t-1}$	1.9032 (1.3469)	3.6940*** (0.8599)	-5.6014*** (1.1869)
ROA$_{t-1}$	-4.5421*** (1.3189)	3.9930*** (0.9345)	0.5539 (1.2726)
Board Size	0.0246 (0.0957)	-0.6381*** (0.0657)	0.6129*** (0.0786)
CEO Age	-0.1016*** (0.0237)	0.1056*** (0.0176)	-0.0042 (0.0199)
Duality	2.1344*** (0.3671)	-0.9423*** (0.2419)	-1.1936*** (0.3162)
CEO Total Compensation	1.3387*** (0.2193)	-1.0370*** (0.1519)	-0.3031* (0.1638)
Volatility	-2.2219** (1.0151)	1.5710** (0.6916)	0.6456 (0.9066)
Intercept	46.8625*** (2.2803)	31.3618*** (1.5505)	21.8014*** (1.9130)

	Independent	Inside	Grey
Industry Dummies	YES	YES	YES
Adj. R-Sq	0.1026	0.1259	0.0351
Number of Observations	8341	8341	8341

Table 11 highlights presents a regression of the percentage of independent directors, the percentage of insiders, and the percentage of grey directors on the SOX dummy variable and various control variables. All regressions are implemented using industry fixed effects to control for industry specific characteristics. We define industry based on Fama and French (1997) 48-industry definition. See Table 9 for detailed information on all variables. We compute robust standard errors following White (1980) to account for any possible heteroskedasticity. Robust standard errors are presented in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 12. CEO Turnover and SOX

CEO Turnover	
Sox	-0.2346*** (0.0377)
Firm Size$_{t-1}$	0.0599*** (0.0188)
Sales$_{t-1}$/AT$_{t-1}$	0.0299 (0.0306)
Capx$_{t-1}$/AT$_{t-1}$	-0.3119 (0.4115)
Leverage$_{t-1}$	-0.2305 (0.1404)
Liquidity$_{t-1}$	-0.0740 (0.1317)
ROA$_{t-1}$	-0.8132*** (0.2081)
Board Size	0.0236** (0.0092)
CEO Age	-0.0031 (0.0026)
Duality	-0.5468*** (0.0378)
CEO Total Compensation	0.0090 (0.0178)
Volatility	0.1712 (0.1080)
Intercept	-1.1356*** (0.2493)

CEO Turnover	
Industry Dummies Adj. R-Sq Number of Observations	YES 0.0515 8371

Table 12 presents a probit regression in which CEO Turnover is regressed on the SOX dummy variable and various control variables. Industry dummies are included to control for industry specific characteristics. We define industry based on Fama and French (1997) 48-industry definition. See Table 9 for detailed information on all variables. We compute robust standard errors following White (1980) to account for any possible heteroskedasticity. Robust standard errors are presented in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 13. Impact of Independence on the Turnover-Accounting Performance Sensitivity

CEO Turnover	Pre-SOX		Post-SOX	
	(1)	(2)	(3)	(4)
IndepDummy	0.0752 (0.0597)	0.0684 (0.0621)	-0.1186 (0.0783)	-0.2080** (0.0867)
ROA_{t-1}	-0.7345*** (0.2686)	-0.8886** (0.3576)	-0.8779*** (0.3376)	-2.7847*** (0.8515)
IndepDummy * ROA_{t-1}		0.1850 (0.4394)		1.9834** (0.8760)
Firm $Size_{t-1}$	0.0518* (0.0276)	0.0520* (0.0276)	0.0666** (0.0263)	0.0674** (0.0264)
$Sales_{t-1}/AT_{t-1}$	0.0380 (0.0400)	0.0385 (0.0399)	0.0194 (0.0476)	0.0192 (0.0476)
$Capx_{t-1}/AT_{t-1}$	-0.0199 (0.5267)	-0.0187 (0.5267)	-0.9987 (0.6824)	-0.9479 (0.6831)
$Leverage_{t-1}$	-0.1467 (0.1891)	-0.1443 (0.1896)	-0.3037 (0.2132)	-0.3090 (0.2134)
$Liquidity_{t-1}$	-0.1375 (0.1856)	-0.1323 (0.1857)	-0.0407 (0.1902)	-0.0166 (0.1911)
Board Size	0.0207* (0.0123)	0.0205* (0.0123)	0.0320** (0.0144)	0.0315** (0.0145)
CEO Age	-0.0007 (0.0036)	-0.0008 (0.0036)	-0.0050 (0.0037)	-0.0050 (0.0037)
Duality	-0.4808*** (0.0546)	-0.4816*** (0.0545)	-0.6055*** (0.0541)	-0.6075*** (0.0540)
CEO Total Compensation	0.0172 (0.0251)	0.0172 (0.0251)	-0.0068 (0.0263)	-0.0071 (0.0263)
Volatility	0.3957** (0.1679)	0.3888** (0.1664)	-0.0251 (0.1571)	-0.0440 (0.1581)

CEO Turnover	Pre-SOX		Post-SOX	
Intercept	-1.3688***	-1.3629***	-1.1105***	-1.0247***
	(0.3589)	(0.3596)	(0.3588)	(0.3599)
Industry Dummies	YES	YES	YES	YES
Adj. R-Sq	0.0479	0.0480	0.0653	0.0666
Number of Observations	3953	3953	4385	4385

Table 13 utilizes a probit model to examine the impact of board independence on the turnover-accounting performance sensitivity during the pre-SOX and post-SOX periods. The dependent variable is CEO turnover. The IndepDummy is a dummy variable that takes the value of 1 if the percentage of independent directors is greater than 50% and 0 otherwise. Industry dummies are included to control for industry specific characteristics. We define industry based on Fama and French (1997) 48-industry definition. See Table 9 for detailed information on all variables. We compute robust standard errors following White (1980) to account for any possible heteroskedasticity. Robust standard errors are presented in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 14. Impact of Independence on the Turnover-Market Performance Sensitivity

CEO Turnover	Pre-SOX		Post-SOX	
	(1)	(2)	(3)	(4)
IndepDummy	0.0767	-0.3853	-0.1280	-0.0379
	(0.0602)	(0.4195)	(0.0786)	(0.1749)
AR FF_{t-1}	-0.1600***	-0.0917	-0.0224	-0.0729
	(0.0395)	(0.0730)	(0.0326)	(0.0916)
IndepDummy * AR FF_{t-1}		-0.0941		0.0569
		(0.0844)		(0.0976)
Firm $Size_{t-1}$	0.0392	0.0389	0.0740***	0.0742***
	(0.0284)	(0.0283)	(0.0262)	(0.0262)
$Sales_{t-1}/AT_{t-1}$	0.0224	0.0236	0.0208	0.0203
	(0.0408)	(0.0407)	(0.0477)	(0.0477)
$Capx_{t-1}/AT_{t-1}$	0.1017	0.1047	-1.0811	-1.0694
	(0.5327)	(0.5333)	(0.6823)	(0.6824)
$Leverage_{t-1}$	-0.0725	-0.0756	-0.1987	-0.1973
	(0.1830)	(0.1829)	(0.2126)	(0.2128)
$Liquidity_{t-1}$	-0.0947	-0.1002	-0.0202	-0.0182
	(0.1899)	(0.1897)	(0.1902)	(0.1905)
Board Size	0.0227*	0.0229*	0.0322**	0.0322**
	(0.0124)	(0.0124)	(0.0145)	(0.0145)
CEO Age	-0.0011	-0.0010	-0.0056	-0.0055
	(0.0036)	(0.0036)	(0.0038)	(0.0038)
Duality	-0.4787***	-0.4799***	-0.6032***	-0.6026***
	(0.0550)	(0.0550)	(0.0543)	(0.0543)
CEO Total Compensation	0.0244	0.0244	-0.0140	-0.0141
	(0.0266)	(0.0266)	(0.0262)	(0.0262)
Volatility	0.5004***	0.5032***	0.1583	0.1591
	(0.1617)	(0.1612)	(0.1389)	(0.1390)
Intercept	-2.2267***	-1.8956***	-1.2505***	-1.3335***

CEO Turnover	Pre-SOX		Post-SOX	
	(0.4086)	(0.5035)	(0.3615)	(0.3894)
Industry Dummies	YES	YES	YES	YES
Adj. R-Sq	0.0485	0.0489	0.0614	0.0615
Number of Observations	3905	3905	4330	4330

Table 14 utilizes a probit model to examine the impact of board independence on the turnover-market performance sensitivity during the pre and post SOX periods. The dependent variable is CEO turnover. The IndepDummy is a dummy variable that takes the value of 1 if the percentage of independent directors is greater than 50% and 0 otherwise. The firm's abnormal returns are calculated following the Fama-French (1993) 3-factor model. Industry dummies are included to control for industry specific characteristics. We define industry based on Fama and French (1997) 48-industry definition. See Table 9 for detailed information on all variables. We compute robust standard errors following White (1980) to account for any possible heteroskedasticity. Robust standard errors are presented in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 15. Changes in Board Composition and CEO Turnover

CEO Turnover	(1)	(2)	(3)
ChangeIndependent	-0.0054**		
	(0.0021)		
ChangeInside		0.0043	
		(0.0034)	
ChangeGrey			0.0039*
			(0.0022)
Firm Size$_{t-1}$	0.0569**	0.0521*	0.0557*
	(0.0288)	(0.0288)	(0.0289)
Sales$_{t-1}$/AT$_{t-1}$	0.0371	0.0250	0.0308
	(0.0541)	(0.0540)	(0.0539)
Capx$_{t-1}$/AT$_{t-1}$	-1.1161	-1.0468	-1.1009
	(0.8272)	(0.8183)	(0.8197)
Leverage$_{t-1}$	-0.1466	-0.1424	-0.1408
	(0.2353)	(0.2343)	(0.2351)
Liquidity$_{t-1}$	-0.1361	-0.0994	-0.1350
	(0.2142)	(0.2139)	(0.2145)
ROA$_{t-1}$	-0.8391**	-0.8497**	-0.8551**
	(0.3784)	(0.3840)	(0.3775)
Board Size	0.0325**	0.0363**	0.0332**
	(0.0158)	(0.0158)	(0.0159)
CEO Age	-0.0032	-0.0036	-0.0032
	(0.0041)	(0.0041)	(0.0041)
Duality	-0.5808***	-0.5783***	-0.5790***
	(0.0583)	(0.0582)	(0.0582)
CEO Total Compensation	-0.0097	-0.0128	-0.0066
	(0.0276)	(0.0275)	(0.0275)
Volatility	-0.1465	-0.1434	-0.1331
	(0.2224)	(0.2216)	(0.2218)

CEO Turnover	(1)	(2)	(3)
Intercept	-1.1432*** (0.3963)	-1.1402*** (0.3982)	-1.1908*** (0.3949)
Industry Dummies	YES	YES	YES
Adj. R-Sq	0.0644	0.0625	0.0629
Number of Observations	3684	3684	3684

Table 15 utilizes a probit model to examine the impact of the changes in board composition on CEO turnover following the passage of the Sarbanes-Oxley Act. The dependent variable is CEO turnover. Industry dummies are included to control for industry specific characteristics. We define industry based on Fama and French (1997) 48-industry definition. See Table 9 for detailed information on all variables. We compute robust standard errors following White (1980) to account for any possible heteroskedasticity. Robust standard errors are presented in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 16. Board Composition and Firm Performance

$AR\ FF_t$	Pre-SOX			Post-SOX		
	(1)	(2)	(3)	(4)	(5)	(6)
$Independent_t$	0.0008 (0.0008)			-0.0094*** (0.0016)		
$Inside_t$		-0.0009 (0.0012)			0.0196*** (0.0025)	
$Grey_t$			-0.0005 (0.0010)			0.0026 (0.0018)
$Firm\ Size_{t-1}$	-0.0075 (0.0160)	-0.0068 (0.0160)	-0.0068 (0.0160)	-0.0091 (0.0264)	-0.0145 (0.0264)	-0.0161 (0.0264)
$Sales_{t-1}/AT_{t-1}$	0.0271 (0.0220)	0.0270 (0.0221)	0.0277 (0.0220)	0.0311 (0.0429)	0.0391 (0.0426)	0.0219 (0.0430)
$Capx_{t-1}/AT_{t-1}$	-0.2741 (0.2883)	-0.2706 (0.2879)	-0.2844 (0.2876)	-1.7583*** (0.6424)	-2.0077*** (0.6437)	-1.7152*** (0.6434)
$Leverage_{t-1}$	-0.2621** (0.1089)	-0.2644** (0.1090)	-0.2605** (0.1091)	0.6174*** (0.1752)	0.6677*** (0.1755)	0.5511*** (0.1755)
$Liquidity_{t-1}$	0.1418 (0.1094)	0.1460 (0.1095)	0.1398 (0.1093)	-0.5800*** (0.1665)	-0.6737*** (0.1661)	-0.6017*** (0.1670)
ROA_{t-1}	-0.0932 (0.2111)	-0.0935 (0.2117)	-0.0981 (0.2107)	-0.3612* (0.2064)	-0.3836* (0.2051)	-0.3457* (0.2072)
Board Size	-0.0171** (0.0067)	-0.0175*** (0.0067)	-0.0168** (0.0067)	0.0189 (0.0130)	0.0328** (0.0130)	0.0173 (0.0131)
CEO Age	-0.0001 (0.0019)	-0.0001 (0.0019)	-0.0002 (0.0019)	-0.0162*** (0.0030)	-0.0171*** (0.0030)	-0.0153*** (0.0030)
Duality	-0.0142 (0.0314)	-0.0134 (0.0314)	-0.0135 (0.0314)	0.3837*** (0.0461)	0.3826*** (0.0460)	0.3623*** (0.0462)
CEO Total Compensation	0.0434** (0.0171)	0.0433** (0.0171)	0.0443*** (0.0171)	-0.0305 (0.0259)	-0.0285 (0.0258)	-0.0440* (0.0256)
Volatility	0.3819*** (0.1191)	0.3826*** (0.1192)	0.3808*** (0.1191)	2.1700*** (0.3078)	2.1687*** (0.3053)	2.1896*** (0.3101)

$AR\ FF_t$	Pre-SOX			Post-SOX		
Intercept	-4.9121***	-4.8477***	-4.8647***	-1.6215***	-2.6556***	-2.1652***
	(0.1875)	(0.1873)	(0.1839)	(0.3693)	(0.3592)	(0.3607)
Industry Dummies	YES	YES	YES	YES	YES	YES
Adj. R-Sq	0.0171	0.0170	0.0170	0.1046	0.1093	0.0978
Number of Observations	3927	3927	3927	4316	4316	4316

Table 16 presents a regression of the firm's abnormal returns on the percentage of the three different types of board directors during both the pre and post SOX periods. Abnormal returns are calculated following the Fama-French (1993) 3-factor model. All regressions are implemented using industry fixed effects to control for industry specific characteristics. We define industry based on Fama and French (1997) 48-industry definition. See Table 9 for detailed information on all variables. We compute robust standard errors following White (1980) to account for any possible heteroskedasticity. Robust standard errors are presented in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 17. Changes in Board Composition and Firm Performance

AR FF_t	(1)	(2)	(3)
ChangeIndependent	-0.0080***		
	(0.0017)		
ChangeInside		0.0164***	
		(0.0024)	
ChangeGrey			0.0009
			(0.0018)
Firm $Size_{t-1}$	-0.0125	-0.0163	-0.0169
	(0.0255)	(0.0254)	(0.0255)
$Sales_{t-1}/AT_{t-1}$	0.0688	0.0535	0.0508
	(0.0473)	(0.0466)	(0.0475)
$Capx_{t-1}/AT_{t-1}$	-1.1521*	-1.1178	-1.0436
	(0.6921)	(0.6869)	(0.6956)
$Leverage_{t-1}$	0.2088	0.2030	0.2244
	(0.1886)	(0.1876)	(0.1887)
$Liquidity_{t-1}$	-0.8479***	-0.7666***	-0.8200***
	(0.1768)	(0.1763)	(0.1777)
ROA_{t-1}	0.2035	0.2067	0.1556
	(0.2000)	(0.1921)	(0.1958)
Board Size	0.0255*	0.0318**	0.0294**
	(0.0135)	(0.0134)	(0.0136)
CEO Age	-0.0108***	-0.0118***	-0.0110***
	(0.0032)	(0.0032)	(0.0032)
Duality	0.3451***	0.3460***	0.3486***
	(0.0491)	(0.0489)	(0.0492)
CEO Total Compensation	-0.0615**	-0.0768***	-0.0611**
	(0.0267)	(0.0267)	(0.0266)
Volatility	3.2982***	3.2873***	3.3179***
	(0.1826)	(0.1809)	(0.1829)
Intercept	-2.5685***	-2.4129***	-2.6382***

AR FF_t	(1)	(2)	(3)
	(0.3167)	(0.3188)	(0.3175)
Industry Dummies	YES	YES	YES
Adj. R-Sq	0.1353	0.1400	0.1298
Number of Observations	3631	3631	3631

Table 17 presents a regression of the firm's abnormal returns on the change in independence, change in insider participation, change in the percentage of grey directors. Abnormal returns are calculated following the Fama-French (1993) 3-factor model. All regressions are implemented using industry fixed effects to control for industry specific characteristics. We define industry based on Fama and French (1997) 48-industry definition. See Table 9 for detailed information on all variables. We compute robust standard errors following White (1980) to account for any possible heteroskedasticity. Robust standard errors are presented in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

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ESSAY 3: GOVERNANCE AND FIRM VALUE: THE EFFECT OF A RECESSION

1. Introduction

Economic conditions may have a substantive influence on the soundness of the firm's governance structure and characteristics. This paper examines the impact of business cycle changes on the relation between corporate governance and firm value. Few studies explore the consequences of the macroeconomic environment on the firm's value and characteristics. Philipon (2004) presents a theoretical model to demonstrate that firms with a bad governance structure have a higher response to aggregate shocks than firms with a good governance structure. Korajczyk and Levy (2003) suggest that the timing of debt issuance is significantly affected by macroeconomic conditions. Hackbarth, Miao, and Morellec (2004) show that capital structure and credit risk are highly influenced by economic conditions. Oxelheim, Wihlborg, and Zhang (2008) propose that the impact of macroeconomic fluctuations on performance and compensation have a negative effect on the ability of managerial compensation to align the interests of managers and shareholders.

This paper adds to the existing literature by investigating the relation between market conditions and corporate governance. We show that the firm's governance structure is vulnerable to fluctuations in the business cycle. Moreover, we examine the impact of the macroeconomic environment on the relation between the firm's governance structure and its value.

We suggest that CEO turnover increases during a recession. Our results support this hypothesis by showing that relative industry turnover increases during bad economic conditions. Due to the increase in managerial turnover throughout a recession, CEOs are subject to increased industry pressure. This is anticipated to have a positive influence on the manager's effort and behavior. In that sense, industry turnover seems to act as a control mechanism against swings in macroeconomic conditions.

We also investigate whether managerial entrenchment is affected by changes in the business cycle. Managers are said to be entrenched when they have power and control over the firm such that they are able to pursue their own private benefits and interests instead of maximizing the shareholders' wealth. We propose that the recession provides managers with a good opportunity to camouflage their behavior and extract more private benefits and, thus, blame the poor performance on the recession. The Entrenchment Index (E-index) constructed by Bebchuk et al. (2009) is used to measure managerial entrenchment. The results demonstrate that managers are more entrenched during economic downturns. That is, bad economic conditions amplify the manager's influence and authority within the firm. Consequently, agency problems are expected to be more pronounced during economic downturns.

In addition, this study investigates the impact of turnover and entrenchment on the value of the firm under different macroeconomic conditions. During economic downturns, the results demonstrate a direct association between turnover and firm value. Moreover, during a recession, we show that the increase in turnover, or excess turnover[25], has a positive influence on the value of the firm. We also highlight a negative association between managerial entrenchment and firm performance. Furthermore, we propose that the effect of entrenchment on firm value is sensitive to macroeconomic changes. Our findings show that, during bad economic conditions, the increase in entrenchment, or excess entrenchment[26], has a converse effect on firm value. The

[25] Excess turnover for each firm in a given recession year is defined as total industry turnover less the median total industry turnover for that firm during nonrecession years.

[26] Excess entrenchment for each firm in a given recession year is defined as the E-index less the median E-index for that firm during nonrecession years.

results also suggest that, during economic downturns, the negative impact of entrenchment on firm value outweighs the positive impact of turnover.

The remaining part of this paper is organized as follows. Section 2 develops the research hypotheses. Section 3 presents the data and descriptive statistics. Section 4 offers empirical evidence on the impact of the macroeconomic environment on industry turnover and managerial entrenchment. Section 5 investigates the effect of industry turnover and managerial entrenchment on firm value during different economic conditions. Section 6 provides robustness checks. Section 7 concludes our research.

2. Hypothesis Development

During economic downturns, a firm is usually closer to financial distress and the manager is confronted with elevated job insecurity. Gilson (1989) suggests that financial distress leads to higher management turnover. The author shows that managerial turnover is higher for distressed firms than it is for non-distressed firms. Moreover, in a recession, poor decisions and behavior on the part of the CEO might worsen the already poor firm performance. In addition, the existing manager might lack the talent and skills required to face the challenges and obstacles presented by aggregate economic shocks. In this paper, we hypothesize that managerial turnover in a given industry amplifies during a recession. Thus, due to the increased risk of losing his/her job, the manager is subject to more pressure during economic downturns.

We also investigate the impact of business cycle changes on managerial entrenchment. As managers become more entrenched, they gain more authority and protection against monitoring and governance systems. Demsetz (1983) proposes that the CEO is more willing to take on self-centered negative net present value projects when he/she has more power over the board of directors. In general, an increase in managerial entrenchment is said to amplify agency problems and lead to higher agency costs. Gompers, Ishii, and Metrick (2003) suggest a positive relation between their G-index and agency costs. Managers generally tend to divert firm resources, operate less efficiently, and take on self-centered decisions when replacing them becomes harder and more costly. An extensive literature suggests that the manager is motivated to pursue projects that are value deteriorating for shareholders, as long as he/she can extract private benefits from such projects (eg. Baumol (1959), Williamson (1964), Jensen and Meckling (1976)). Jensen and Ruback (1983) and Shleifer and Vishny (1989) emphasize that the severity of this agency problem increases when managers are entrenched and have enough power to prevent takeover attempts. Moreover, several studies propose that the imposition of state takeover laws leads to higher agency costs (Borokhovich, Brunarski, and Parrino (1997); Bertrand and Mallainathan (1999a, 1999b, and 2000); Garvey and Hanka (1999)). Furthermore, Baum, Chakraborty, Han, and Liu (2009) use the G-index to proxy for agency costs.[27]

A recession may offer the manager an opportunity to camouflage his/her self-centered decisions that have a negative effect on the firm's value. In such a case, a recession is expected to increase the manager's consumption of private benefits and expropriation of shareholders' wealth. In other words, managers might try to extract as much private benefits as possible and then blame the poor performance on the recession. Johnson et al. (2000) examine the role that corporate governance played during the Asian financial crisis 1997-1998. They show that poor governance structures had a significant impact on the decrease in stock prices and the exchange rate depreciations during the crisis. They suggest that managers are more likely to steal and

[27] Since agency costs cannot be observed, Baum, Chakraborty, Han, and Liu (2009) suggest that the G-index can be used to assess the soundness of the governance structure.

consume private benefits during bad economic conditions. This leads to more depreciation and stock price deterioration during the crisis. Accordingly, we hypothesize that managerial entrenchment increases during a recession and, thus, leads to lower firm value.

An alternative hypothesis suggests that managerial entrenchment might decrease during a recession. In normal conditions, the CEO might be entrenched or engage in perquisite consumption. That is, agency problems might arise due to the conflict of interest between the CEO and the shareholders. Jensen (1986) presents his free cash flow hypothesis in which he suggests that free cash flow in the hands of the managers might induce them to engage in expansionary activities by investing in negative NPV projects. Accordingly, in normal conditions, the CEO might be more entrenched and have more control over the firm and this exacerbates the agency problem. Therefore, agency problems, as proxied by managerial entrenchment, might be less severe during periods of economic distress.[28] However, our results do not support this hypothesis.

This paper also examines the effect of industry turnover and managerial entrenchment on firm value during different macroeconomic circumstances. The rise in relative industry turnover during bad economic conditions is anticipated to elevate the pressure on the manager and, thus, have a direct impact on the manager's effort and behavior. That is, the risk of losing his/her job induces the CEO to exert more effort in order to satisfy shareholders and maintain his/her office. Therefore, we hypothesize that, during a recession, industry turnover has a positive impact on the value of the firm. On the other hand, CEO entrenchment is expected to exacerbate agency problems and, thus, reduces firm value. Several studies show that firms with low shareholder

[28] In general, during bad economic conditions, one would expect lower levels of free cash flow in the hands of the managers. Accordingly, the agency problem might be less pronounced during a recession.

rights have inferior performance as compared to firms with high shareholder rights (Gompers et al. (2003), Core et al. (2006), Bebchuk et al. (2009)). Since managerial entrenchment is predicted to increase during a recession, the converse impact of entrenchment on the value of the firm is anticipated to be more pronounced during that period.

3. Data and Descriptive Statistics

3.1 Data and Variable Definitions

This paper utilizes data from Compustat, ExecuComp, and RiskMetrics. Compustat Fundamentals Annual is used to obtain data regarding the firm's financial information. ExecuComp provides information regarding the compensation and characteristics of the firm's top executives. Finally, the RiskMetrics database offers data on the firm's corporate governance.

We examine the impact of market conditions on corporate governance and firm value during the period 2001 – 2009. In order to identify recession periods, business cycle data is obtained from the National Bureau of Economic Research (NBER). The NBER identifies 2 recession cycles during the period 2001 – 2009:

(i) March 2001 – November 2001
(ii) December 2007 – June 2009

As a result, four recession years are identified: 2001, 2007, 2008, and 2009. We define **Rdummy** as a dummy variable that takes the value of 1 if the year is a recession year and 0 otherwise.[29] To improve the robustness of our results, two additional macroeconomic variables, which are highly correlated with economic conditions, are used. The two macroeconomic

[29] Consistent with Hund et al. (2010) and Hovakimian (2011), a given year is classified as a recession year if it includes at least one recession month.

variables are the GDP growth rate and the Default Spread.[30] An increase in GDP growth suggests an improvement in economic conditions. GDP growth is calculated using data from the National Bureau of Economic Research (NBER). The probability of default increases during bad economic conditions. Therefore, an increase in the default spread signals a deterioration in the economic situation. Default spread is calculated as the difference between the average annual yield on Moody's Baa corporate bonds and the average annual yield on Moody's Aaa corporate bonds.[31]

We first investigate whether a recession leads to an increase in CEO turnover in a given industry. Data from ExecuComp is used to identify CEO turnover. A CEO turnover is documented if the CEO for a given year is different from the CEO for the previous year. **IndTurnover** is defined as the relative CEO turnover in a given industry in a given year. Industry is defined following the Fama & French (1997) 48-industry definition.

We also study the effect of economic conditions on the soundness of the firm's governance structure. Gompers, Ishii, and Metrick (2003) present their G-index as a measure of the manager's authority and influence over a given firm. The calculation of the G-index is based on 24 governance provisions. An increase in the firm's G-index indicates an increase in the manager's power and a reduction in the soundness of the firm's governance structure.[32] Bebchuk, Cohen, and Ferrell (2009) suggest that only six of the 24 provisions have a significant impact on the value of the firm. They propose that the negative impact of the G-index on firm

[30] Both macroeconomic variables are computed on an annual basis.
[31] In unreported results, we find a very strong correlation between the two macroeconomic variables and the recession.
[32] The G-index cannot be calculated using the RiskMetrics database for the period 2007 – 2009. In 2007, RiskMetrics followed a new methodology, which is in accordance to ISS conditions and specifications, to collect the governance data. This new methodology does not permit the calculation of the G-index since it does not gather all the variables required to construct the index.

value, documented by Gompers et al. (2003), is mainly due to six provisions. Thus, they construct their E-index based on these six provisions. The six provisions are: golden parachutes, poison pills, staggered boards, supermajority requirements for charter amendments, supermajority requirements for merger amendments, and limits to shareholder bylaw amendments. Consequently, we use the Entrenchment Index (E-Index) constructed by Bebchuk et al. (2009) in order to study the effect of a recession on managerial entrenchment.

Furthermore, this article examines the effect of the firm's governance structure on firm value under different market conditions. Tobin's Q has long been used as a measure of firm value by many researchers (e.g. Bebchuk et al. (2009)). In order to account for industry characteristics, we use the Industry-Adjusted Tobin's Q to proxy for firm value. Tobin's Q is calculated following Chung & Pruitt (1994).[33] In a given year, Industry-Adjusted Tobin's Q is calculated as the difference between the firm's Tobin's Q and its industry median Q.

In addition, we investigate the impact of excess turnover and excess entrenchment on the change in firm value during economic downturns. In order to calculate excess industry turnover during a given recession year, we first calculate the median relative industry turnover for each firm during the nonrecession period.[34] In such a case, excess turnover for each firm in a given recession year is defined as relative industry turnover less the median relative industry turnover for that firm during good economic conditions. Similarly, we calculate excess managerial entrenchment and the change in industry adjusted Tobin's Q.

$$ExcessTurnover_{ir} = IndTurnover_{ir} - MedianIndTurnover_{ig} \qquad \text{(Equation 1)}$$

[33] Since the calculation of Tobin's Q is complex, Chung and Pruitt (1994) present a simpler estimation of Tobin's Q. They show that their proxy for Tobin's Q explains 96.6% of the variation in Tobin's Q.
[34] The nonrecession period comprises the following years: 2002, 2003, 2004, 2005, and 2006.

$$\text{ExcessE}_{ir} = \text{E}_{ir} - \text{MedianE}_{ig} \qquad \text{(Equation 2)}$$

$$\text{ChangeIndAdjQ}_{ir} = \text{IndAdjusted Q}_{ir} - \text{MedianIndAdjusted Q}_{ig} \qquad \text{(Equation 3)}$$

where i = 1, 2,…,n refers to firm i and r = 2001, 2007, 2008, 2009 refers to recession year r. The subscript g refers to the period of good economic conditions. For example, **IndTurnover_{ir}** is the relative industry turnover for firm i in recession year r. **$\text{MedianIndTurnover}_{ig}$** is the median relative industry turnover for firm i during good economic conditions.

As for control variables, we use variables that are generally suggested by the literature. Our control variables include: firm size, capital expenditures, leverage, liquidity, ROA, CEO age, board size, duality, and percentage independence. Detailed information on all variables used in this paper is provided in Table 18. Furthermore, in all regressions, we apply year random effects in order for our results not to be driven by a general trend towards a certain change in industry turnover and/or managerial entrenchment overtime. We also include industry dummies to control for unobserved industry specific characteristics. In addition, we use White (1980) robust standard errors to account for any possible heteroskedasticity.

3.2 Descriptive Statistics

Table 19 presents descriptive statistics on relative industry turnover and managerial entrenchment under different economic conditions. Table 19 Panel A shows that, using both the mean and median, relative industry turnover is higher during the recession period. The mean relative industry turnover increases from 0.114 in the nonrecession period to 0.126 in the recession period. Moreover, we highlight an increase in managerial entrenchment during economic downturns. We document an increase in the mean E-index from 2.373 in the nonrecession period to 3.236 in the recession period.[35] In addition, Table 19 Panel B demonstrates that both excess industry turnover and excess entrenchment are positive and significantly different from zero during the period of economic distress. Therefore, Table 19 suggests that both industry turnover and managerial entrenchment increase during recessionary periods.

4. Impact of Recession on Industry Turnover and Managerial Entrenchment

4.1 Turnover and Recession

We first investigate whether relative industry turnover rises during periods of economic distress. The following regression model is used to study the effect of a recession on CEO relative industry turnover:

$$IndTurnover_{it} = \alpha + \beta_1 Rdummy_t + \text{Control Variables}_{it} + \varepsilon_{it} \quad \text{(Equation 4)}$$

where i = 1, 2, …, n refers to firm i and t = 2001, 2002, …, 2009 refers to year t. The coefficient estimate of **Rdummy** is expected to be positive and significant. This indicates that CEO turnover increases during a recession. Since turnover is measured at the industry level, the control variables are also measured at the industry level. Therefore, we use the total number of CEOs who also serve as chairs of the board in a given industry instead of the duality dummy variable. As for all other control variables, we use their industry means in a given year to predict industry turnover. The results are reported in Table 20.

[35] The results are similar when we calculate the mean and median of the average industry turnover and average entrenchment for each firm during both economic periods. That is, using both the mean and median, the average industry turnover and average entrenchment for each firm are higher in the recession period than they are in the nonrecession period.

Table 20 column 1 shows that relative industry turnover is significantly higher during recessionary periods. Accordingly, managers are said to face a higher risk of losing their jobs during bad economic conditions. Furthermore, Table 20 columns 2 and 3 underline the relation between the two additional macroeconomic variables and relative industry turnover. We show that industry turnover increases significantly with the reduction in the GDP growth rate. Furthermore, industry turnover is significantly higher when the default spread is higher. These findings suggest that managers are subject to additional industry pressure during economic downturns. The increased pressure is expected to have a positive impact on managerial effort and behavior.

Consistent with Huson, Parino, and Starks (2001), the results document a direct relationship between firm size and turnover. Moreover, relative industry turnover is positively related to capital expenditures and leverage. Consistent with Yermack (1996), board size is negatively associated with turnover. The results also highlight a negative relation between turnover and age. A similar association between turnover and age is reported by Agrawal and Nasser (2010).

4.2 Entrenchment and Recession

We now investigate the impact of the macroeconomic environment on managerial entrenchment. The following regression model is used:

$$\text{E-Index}_{it} = \alpha + \beta_1 \text{Rdummy}_t + \text{Control Variables}_{it} + \varepsilon_{it} \qquad \text{(Equation 5)}$$

Table 21 column 1 shows that managerial entrenchment is significantly higher during the recession. This suggests that the manager may be able to exploit the opportunity presented by bad economic conditions to extract more private benefits. In such a case, the manager may take advantage of the recession to camouflage his/her self-centered decisions and, consequently, blame the poor firm performance on the bad economic circumstances. Agency problems are, therefore, anticipated to be more pronounced during recessionary periods. Johnson et al. (2000) suggest that the managerial consumption of private benefits and theft is expected to increase during bad conditions.

Table 21 columns 2 and 3 highlight the impact of GDP growth and default spread on managerial entrenchment. The results emphasize that managers take advantage of bad economic conditions to increase their entrenchment. Managerial entrenchment is found to increase significantly with: (i) the increase in the default spread, or (ii) the decrease in the GDP growth rate.

In addition, Table 21 documents a negative relation between the size of the firm and managerial entrenchment. This suggests that agency problems are more pronounced in small firms. The results show that capital expenditure, which proxies for growth opportunities or "hard spending", is negatively related to managerial entrenchment. Moreover, liquidity is found to have a converse impact on the firm's E-index. Firms with higher liquidity are expected to have higher investment opportunities and make more investments. Therefore, the presence of investment opportunities and the ability to invest are anticipated to mitigate agency problems. The results also highlight a positive relation between board size and entrenchment. Several studies suggest that managers are not successfully or efficiently monitored by large boards of directors (e.g. Yermack 1996). Surprisingly, we find that CEO age is negatively related to entrenchment. It is generally suggested that managers gain more control and power over the firm as their age increase. However, the results in this paper do not support this hypothesis. In addition, our findings highlight a positive association between board independence and managerial entrenchment. Dah, Frye, and Hurst (2011) show that, during the post-SOX period, board independence is directly associated with managerial job security and immunity.

5. Industry Turnover, Managerial Entrenchment, and Firm Value

5.1 Impact of Turnover and Entrenchment on Firm Value

In this section, we start by examining the marginal impact of both turnover and entrenchment on firm value during different economic conditions. Consistent with the literature, we use the Industry-Adjusted Tobin's Q as a proxy for the value of the firm.[36] The increase in industry turnover during a recession is expected to increase the pressure on the manager and, thus, have a positive impact on the manager's effort and behavior. This is anticipated to help improve the performance of the firm. On the other hand, since managerial entrenchment triggers an increase in agency problems, a negative relation between the E-index and Tobin's Q is expected. We also investigate whether the marginal impact of managerial entrenchment on firm value is greater during bad economic periods. The following regression model is used:

$$IndAdjustedQ_{it} = \alpha + \beta_1 Rdummy_t + \beta_2 IndTurnover_{it} + \beta_3 (Rdummy_t * IndTurnover_{it}) + \beta_4 E\text{-}index_{it} + \beta_5 (Rdummy_t * E\text{-}index_{it}) + Control\ Variables_{it} + \varepsilon_{it} \quad \text{(Equation 6)}$$

[36] Using Tobin's Q instead of Industry Adjusted Tobin's Q yields similar results in all of our regressions.

The impact of CEO turnover on firm value during normal economic conditions is represented by β_2. The overall impact of CEO turnover on the value of the firm during a recession is represented by the summation of β_2 and β_3. A significant β_3 suggests that the marginal impact of turnover on firm value is more significant during a recession than it is during normal conditions. Similarly, the relation between managerial entrenchment and firm value during normal economic conditions is revealed by β_4. The total impact of managerial entrenchment on firm value during a recession is demonstrated by the summation of β_4 and β_5. The effect of managerial entrenchment on the value of the firm is more significant during a recession if β_5 is significant.

Table 22 presents the results of regressing industry adjusted Tobin's Q on relative industry turnover, entrenchment, and various control variables. During normal conditions, the results highlight a negative association between industry turnover and firm value. As for the recessionary period, we find that the turnover interaction variable is positive and significant. Furthermore, the impact of industry turnover on the value of the firm is significantly higher during the recession period as opposed to the nonrecession period. Therefore, Table 22 shows that, during a recession, the overall impact of industry turnover on the value of the firm is positive. Therefore, we propose that industry turnover imposes more pressure on managers during a recession and, thus, induces them to exert more effort. This leads to an appreciation in the value of the firm. Concerning managerial entrenchment, the results demonstrate a negative and significant relation between entrenchment and firm value during nonrecession periods. The coefficient estimate for the entrenchment interaction variable is negative; however, it is not significant. That is, the marginal impact of entrenchment on the value of the firm during bad economic conditions is not significantly different than that during normal economic conditions.

In addition, column 3 shows that the coefficient estimates for both **IndTurnover** and the turnover interaction variable turn insignificant when managerial entrenchment is introduced in the regression equation.

Furthermore, in unreported results, we compute the standardized coefficient estimates in order to compare the marginal impacts of industry turnover and managerial entrenchment. The results suggest that, during a recession, the overall negative marginal impact of entrenchment on firm value outweighs the overall positive impact of industry turnover on firm value.[37]

In addition, we document a positive and significant relation between capital expenditures and the value of the firm. Capital expenditures proxies for the firm's growth and investment opportunities. Therefore, consistent with the literature, firms with more growth opportunities have higher values. The results highlight a positive relation between liquidity and firm value. This is consistent with Hoshi, Kashyap, and Scharfstein (1991) who suggest that liquidity proxies for the firm's investment profitability and, thus, has a positive impact on firm value. Moreover, we find that ROA, which also proxies for the firm's profitability, is positively related to the value of the firm. Consistent with Yermack (1996), we find that firms with larger boards of directors have lower values. Yermack (1996) proposes that smaller boards of directors are more effective in monitoring the firm's management. This is mainly due to the free-riding problem which exacerbates as boards become larger. The results also show that an increase in CEO age leads to a reduction in the value of the firm. Finally, we highlight a negative association between board independence and firm value. Dah, Frye, and Hurst (2011) demonstrate that the increased participation of independent directors, following the implementation of the Sarbanes-Oxley Act of 2002, has a converse impact on firm performance.

[37] Results are available upon request.

Using the default spread dummy variable instead of the recession dummy variable (Rdummy) to identify bad economic conditions, Table 23 investigates the impact of the macroeconomic environment on the relation between the firm's governance structure and its value. In a given year, the default spread dummy variable is defined to be equal to 1 if the default spread is higher than the full sample period median default spread and zero otherwise. Therefore, a value of one for the default spread dummy signals bad economic conditions, and vice versa.[38] The results reported in Table 23 are very much alike those presented in Table 22. However, the negative relation between relative industry turnover and firm value is no longer significant during normal conditions. In addition, the coefficient estimate for the entrenchment interaction variable is negative and significant. Thus, Table 23 suggests that the converse impact of managerial entrenchment on firm value is more pronounced during economic downturns.

5.2 Impact of Excess Turnover and Excess Entrenchment on Firm Value

In this section, the impact of excess turnover and excess entrenchment on the change in firm value is examined. Therefore, we run the following regression model:

$$\text{ChangeIndAdjQ}_{ir} = \alpha + \beta_1\text{ExcessTurnover}_{ir} + \beta_2\text{ExcessE}_{ir} + \text{Control Variables}_{ir} + \varepsilon_{ir} \quad \text{(Equation 7)}$$

Table 24 presents the results in which the change in industry adjusted Tobin's Q is regressed on excess turnover, excess entrenchment, and various control variables. Column 1 proposes a positive relation between excess industry turnover and the change in firm value.

[38] We also conduct our analysis by employing a GDP growth dummy variable instead of the recession dummy variable to identify economic downturns. However, the results are identical to those reported in Table 22. That is, the identified recession years (2001, 2007, 2008, 2009) are the same years in which the GDP growth rate is below the median GDP growth rate, calculated based on the whole sample period.

Therefore, during the recession period, the increase in industry turnover has a positive impact on the change in firm value. Concerning the change in managerial entrenchment, the results suggest a negative and significant relation between excess entrenchment and the change in firm value. Thus, the increase in managerial entrenchment has a negative effect on the change in the value of the firm during economic downturns.

In unreported results, we again compute the standardized coefficient estimates to compare the impacts of excess turnover and excess entrenchment on the change in firm value. The results document that, during the recession period, the impact of excess entrenchment on the change in firm value outweighs that of excess turnover.[39]

6. Robustness Checks

One of the main problems that arise in empirical studies examining the relation between the firm's governance structure and its value is an endogeneity problem. In this paper, we try to resolve this issue by (i) including industry dummy variables in all of our regressions to control for industry specific characteristics, and/or (ii) using instrumental variables and conducting two stage least square regressions. In this section, we explore the robustness of our results when using the instrumental variables technique to resolve any potential endogeneity. We use the one period lagged values of turnover and entrenchment as their respective instrumental variables.

Accordingly, **LagIndTurnover** and (**Rdummy * LagIndTurnover)** are used as instruments for relative industry turnover and the interaction variable between industry turnover and the recession. The results are presented in Table 25 columns 1 and 3. Confirming our previous results, Table 25 demonstrates that the coefficient estimate for the turnover interaction

[39] Results are available upon request.

variable is positive and significant. Therefore, during a recession, industry pressure has a positive impact on the value of the firm.

Bebchuk et al. (2009) introduce the E-index and examine its effect on the value of the firm. The authors regress firm value (as proxied by Tobin's Q or Industry Adjusted Tobin's Q) on the E-index. They highlight a negative and significant relation between entrenchment and the value of the firm. In their paper, they also address the endogeneity problem or the simultaneity issue. They argue that it might not be clear whether higher levels of entrenchment lead to lower firm values, or whether managers of lower valued firms are generally more entrenched. However, Bebchuk et al. (2009) suggest that high levels of managerial entrenchment lead, at least partially, to lower firm values. They show that, though firms with high entrenchment levels had lower values at the beginning of the sample period, these firms experience a further reduction in their values over time.

To improve the robustness of our results, we conduct a two stage least squares by using the one period lag E-index and the multiplication of the lag E-index by the recession dummy variable as instruments for the E-index and the entrenchment interaction variable. The results are reported in Table 25 columns 2 and 3. Consistent with our previous findings, we highlight a negative and significant relation between managerial entrenchment and the value of the firm during normal economic conditions. Moreover, though insignificant, the coefficient estimate for the entrenchment interaction variable is negative.

In addition, Table 26 presents similar analysis when using the default spread dummy variable instead of the recession dummy variable. However, the results are almost identical to those reported in Table 23.

7. Conclusion

This paper examines the relation between corporate governance and the value of the firm during different phases of the business cycle. We show that changes in the firm's macroeconomic environment have a substantial effect on its governance structure and characteristics.

We suggest that, due to the bad economic conditions, turnover in a given industry is expected to increase. The increase in industry turnover is anticipated to increase the industry pressure on managers and, thus, induce them to exert more effort in order to satisfy shareholders. The results show that industry turnover is significantly higher during periods of economic distress.

This research also examines the impact of economic conditions on the levels of managerial entrenchment. The results highlight a significant increase in managerial entrenchment during economic downturns. In general, firms are anticipated to increase anti-takeover provisions during bad macroeconomic circumstances in order to prevent hostile takeover. Moreover, we suggest that bad economic conditions present a good opportunity for managers to camouflage their activities and extract more private benefits. In such a case, managers might take advantage of the situation and blame the poor performance on the recession. Therefore, agency problems are expected to increase during a recession. As a result, the increase in managerial entrenchment leads to a reduction in the firm's value and, thus, fosters the deterioration in economic conditions.

In addition, we examine the impact of industry turnover and managerial entrenchment on the value of the firm under different macroeconomic conditions. The results show that industry turnover and managerial entrenchment have opposite effects on firm value during economic downturns. While industry turnover has a positive impact on firm performance, managerial entrenchment is negatively associated with firm value. Furthermore, we demonstrate that excess industry turnover has a positive effect on the change in firm value. Our findings also suggest that the increase in managerial entrenchment during a recession has a negative impact on the change in firm value. Finally, we document that the negative impact of managerial entrenchment on firm value during a recession outweighs the positive impact of industry turnover.

Tables

Table 18. Variable Definitions

Variable	Variable Definition
Firm Size	The natural logarithm of Total Assets.
Capx/At	The ratio of Capital Expenditures to Total Assets.
Leverage	The ratio of long term Debt to Total Assets.
Liquidity	The difference between Current Assets and Current Liabilities divided by Total Assets
ROA	The ratio of EBITDA to Total Assets
Board Size	The total number of board members in a given year.
CEO Age	The CEO's Age
Duality	A dummy variable equal to 1 if the CEO is also the chair of the board of directors and 0 otherwise.
Percentage Independence	The percentage of board members who are independent directors.
Rdummy	A dummy variable equal to 1 if the year is a recession year and 0 otherwise.
Tobin's Q	Tobin's Q calculated following Chung & Pruitt (1994). It is equal to the sum of the Market Value of Equity, liquidating value of Preferred Stock, and Debt divided by the book value of Total Assets.
IndAdjusted Q	Industry-Adjusted Tobin's Q is calculated as the difference between the firm's Q and its industry median Q.
IndTurnover	The relative CEO turnover in a given industry in a given year.
E-Index	Entrenchment Index calculated following Bebchuk et al. (2009).
GDP Growth	The percentage change in GDP from year t-1 to year t.
Default Spread	The difference between the average annual yield on moody's baa corporate bonds and the average annual yield on moody's aaa corporate bonds.

Variable	Variable Definition
Default Dummy	The default spread dummy variable is defined to be equal to 1 if the default spread in a given year is higher than the full sample period median default spread and zero otherwise.
ExcessTurnover	ExcessTurnover for each firm in a given recession year is defined as relative industry turnover less the median relative industry turnover for that firm during nonrecession years.
ExcessE	ExcessE for each firm in a given recession year is defined as the E-index less the median E-index for that firm during nonrecession years.
ChangeIndAdjQ	ChangeIndAdjQ for each firm in a given recession year is defined as the industry adjusted Tobin's Q less the median industry adjusted Tobin's Q for that firm during the nonrecession period.

Table 19. Descriptive Statistics

Panel A

Variable	NonRecession Period Mean	NonRecession Period Median	Recession Period Mean	Recession Period Median
Total Industry Turnover	0.114	0.108	0.126[a]	0.123[b]
E-Index	2.373	2.000	3.236[a]	3.000[b]

Panel B

Variable	Mean	Median
ExcessTurnover	1.117***	0.600***
ExcessE	0.908***	1.000***

This table presents descriptive statistics on relative industry turnover and managerial entrenchment during different macroeconomic conditions for the period 2001 – 2009. Based on data from the NBER, we identify 4 recession years: 2001, 2007, 2008, and 2009. Industry is defined following Fama and French 48-industry definition. Panel A highlights the mean and median for both IndTurnover and E-index under the 2 economic periods. IndTurnover is defined as the relative CEO turnover in a given industry in a given year. E-index is calculated following Bebchuk et al. (2009). The superscript (a) denotes that the difference in means between the 2 samples is statistically significant at the 1% level, using a t-test. The superscript (b) suggests that the difference in medians between the 2 samples is statistically significant at the 1% level, using the Wilcoxon-Mann-Whitney test. Panel B documents the mean and median for both ExcessTurnover and ExcessE during the recession period. ExcessTurnover for each firm in a given recession year is defined as relative industry turnover less the mean relative industry turnover for that firm during nonrecession years. ExcessE for each firm in a given recession year is defined as the E-index less the mean E-index for that firm during nonrecession years. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. The t-test and the Wilcoxon signed-rank test are implemented to analyze the significance of the mean and median, respectively.

Table 20. Industry Turnover and Macroeconomic Conditions

IndTurnover	(1)	(2)	(3)
Rdummy	0.0159*** (0.0013)		
GDP Growth		-0.2159*** (0.0280)	
Default Spread			0.0037*** (0.0007)
Mean Firm Size	0.0297*** (0.0050)	0.0332*** (0.0050)	0.0343*** (0.0051)
Mean Capx/AT	0.0489 (0.0548)	0.0704 (0.0609)	0.1781*** (0.0568)
Mean Leverage	0.1810*** (0.0252)	0.1886*** (0.0259)	0.2071*** (0.0255)
Mean Liquidity	0.0024 (0.0106)	-0.0066 (0.0108)	-0.0067 (0.0110)
Mean ROA	0.0649*** (0.0192)	0.0489*** (0.0187)	0.0474** (0.0186)
Mean Board Size	-0.0141*** (0.0021)	-0.0150*** (0.0021)	-0.0152*** (0.0021)
Mean CEO Age	-0.0045*** (0.0006)	-0.0047*** (0.0006)	-0.0048*** (0.0006)
Total Duality	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Mean Independence	-0.0017*** (0.0002)	-0.0017*** (0.0002)	-0.0014*** (0.0002)
Intercept	0.4109*** (0.0438)	0.4205*** (0.0447)	0.3738*** (0.0435)
Industry Dummies	Yes	Yes	Yes
R-Sq	0.1658	0.1575	0.1541
Number of Observations	15602	15602	15602

Table 20 presents the regressions of IndTurnover on 3 different macroeconomic variables and various control variables for the period 2001 – 2009. Based on data from the NBER, we identify 4 recession years: 2001, 2007, 2008, and 2009. Rdummy is a dummy variable equal to 1 if the year is a recession year and 0 otherwise. GDP growth is calculated using data from the National Bureau of Economic Research (NBER). Default spread is calculated as the difference between the average annual yield on Moody's Baa corporate bonds and the average annual yield on Moody's Aaa corporate bonds. IndTurnover is defined as the relative CEO turnover in a given industry in a given year. Industry is defined following Fama and French 48-industry definition. Since turnover is measured at the industry level, the control variables are also measured at the industry level. We use the total number of CEOs who also serve as chairs of the board in a given industry instead of the duality dummy variable. For all other control variables, we use their industry means in a given year to predict IndTurnover. See Table 18 for details on the control variables. Year random effects is employed in order for the results not to be driven by a general trend towards a certain change in industry turnover overtime. Industry dummy variables are included to control for unobserved industry specific characteristics. Following White (1980), we compute robust standard errors. Robust standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 21. Managerial Entrenchment and Macroeconomic Conditions

E-Index	(1)	(2)	(3)
Rdummy	0.7967***		
	(0.0269)		
GDP Growth		-13.6372***	
		(0.5287)	
Default Spread			0.2639***
			(0.0169)
Firm Size	-0.1040***	-0.1040***	-0.0997***
	(0.0120)	(0.0121)	(0.0124)
Capx/AT	-1.1126***	-1.2121***	-0.8402**
	(0.3451)	(0.3424)	(0.3506)
Leverage	0.0512	0.0772	0.077
	(0.0953)	(0.0957)	(0.0977)
Liquidity	-0.7703***	-0.7719***	-0.7876***
	(0.0930)	(0.0943)	(0.0962)
ROA	-0.0003	-0.0009	-0.001
	(0.0015)	(0.0015)	(0.0015)
Board Size	0.0618***	0.0619***	0.0595***
	(0.0072)	(0.0072)	(0.0073)
CEO AGE	-0.0043**	-0.0045**	-0.0029
	(0.0018)	(0.0018)	(0.0018)
Duality	-0.007	-0.0175	-0.0780***
	(0.0269)	(0.0273)	(0.0277)
Percentage Independent	0.0194***	0.0195***	0.0220***
	(0.0009)	(0.0009)	(0.0009)
Intercept	1.3703***	2.2878***	1.1614***
	(0.1996)	(0.2084)	(0.2114)
Industry Dummies	Yes	Yes	Yes
R-Sq	0.2147	0.1923	0.1566
Number of Observations	9295	9295	9295

Table 21 presents the regressions of the E-index on 3 different macroeconomic variables and various control variables for the period 2001 – 2009. Based on data from the NBER, we identify 4 recession years: 2001, 2007, 2008, and 2009. Rdummy is a dummy variable equal to 1 if the year is a recession year and 0 otherwise. GDP growth is calculated using data from the National Bureau of Economic Research (NBER). Default spread is calculated as the difference between the average annual yield on Moody's Baa corporate bonds and the average annual yield on Moody's Aaa corporate bonds. The E-index is calculated following Bebchuk et al. (2009). See Table 18 for details on the control variables. Year random effects is employed in order for the results not to be driven by a general trend towards a certain change in entrenchment overtime. Industry dummy variables are included to control for unobserved industry specific characteristics. Industry is defined following Fama and French 48-industry definition. Following White (1980), we compute robust standard errors. Robust standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 22. Industry Turnover, Managerial Entrenchment, and Firm Value

IndAdjusted Q	(1)	(2)	(3)
Rdummy	-0.0396 (0.0448)	0.1378*** (0.0513)	0.0719 (0.0658)
IndTurnover	-0.4319* (0.2267)		-0.2582 (0.2177)
Rdummy * IndTurnover	0.9285*** (0.3348)		0.4927 (0.3258)
E-Index		-0.0553*** (0.0098)	-0.0556*** (0.0098)
Rdummy * E-Index		-0.0118 (0.0146)	-0.0099 (0.0146)
Firm Size	-0.0018 (0.0104)	0.0062 (0.0100)	0.0066 (0.0100)
Capx/AT	1.9079*** (0.4365)	1.5376*** (0.4091)	1.5384*** (0.4090)
Leverage	-0.1144 (0.1179)	-0.0848 (0.1183)	-0.0870 (0.1182)
Liquidity	0.8024*** (0.0907)	0.7088*** (0.0921)	0.7101*** (0.0921)
ROA	0.0502*** (0.0039)	0.0505*** (0.0041)	0.0505*** (0.0041)
Board Size	-0.0208*** (0.0053)	-0.0174*** (0.0051)	-0.0174*** (0.0051)
CEO AGE	-0.0065*** (0.0014)	-0.0065*** (0.0014)	-0.0065*** (0.0014)
Duality	0.0416** (0.0207)	0.0339 (0.0208)	0.0327 (0.0208)
Percentage Independent	-0.0033*** (0.0007)	-0.0019*** (0.0007)	-0.0018** (0.0007)
Intercept	0.3387 (0.2171)	0.2253 (0.2030)	0.2561 (0.2081)
Industry Dummies	Yes	Yes	Yes
R-Sq	0.288	0.2998	0.3
Number of Observations	9870	9295	9295

This table presents the regressions of the industry adjusted Tobin's Q on Rdummy, IndTurnover, turnover interaction (Rdummy * IndTurnover), E-index, entrenchment interaction (Rdummy * E-Index), and various control variables for the period 2001 – 2009. The industry adjusted Tobin's Q is calculated as the difference between the firm's Q and its industry median Q. Based on data from the NBER, we identify 4 recession years: 2001, 2007, 2008, and 2009. Rdummy is a dummy variable equal to 1 if the year is a recession year and 0 otherwise. IndTurnover is defined as the relative CEO turnover in a given industry in a given year. The E-index is calculated following Bebchuk et al. (2009). Industry is defined following Fama and French 48-industry definition. See Table 18 for details on the control variables. A year random effects model is employed. Industry dummy variables are included to control for unobserved industry specific characteristics. Following White (1980), we compute robust standard errors. Robust standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 23. Industry Turnover, Managerial Entrenchment, and Firm Value

IndAdjusted Q	(1)	(2)	(3)
Default Dummy	0.0248 (0.0451)	0.2381*** (0.0461)	0.1798*** (0.0618)
IndTurnover	-0.3261 (0.2117)		-0.2403 (0.2037)
Default Dummy * IndTurnover	0.6437* (0.3364)		0.4480 (0.3288)
E-Index		-0.0303*** (0.0090)	-0.0313*** (0.0090)
Default Dummy * E-Index		-0.0491*** (0.0136)	-0.0477*** (0.0136)
Firm Size	-0.0004 (0.0104)	0.0099 (0.0100)	0.0098 (0.0100)
Capx/AT	1.8528*** (0.4398)	1.5143*** (0.4139)	1.5159*** (0.4140)
Leverage	-0.1315 (0.1182)	-0.1059 (0.1184)	-0.1063 (0.1184)
Liquidity	0.8001*** (0.0906)	0.7168*** (0.0921)	0.7169*** (0.0921)
ROA	0.0503*** (0.0039)	0.0507*** (0.0041)	0.0507*** (0.0041)
Board Size	-0.0211*** (0.0053)	-0.0185*** (0.0051)	-0.0184*** (0.0051)
CEO AGE	-0.0063*** (0.0014)	-0.0061*** (0.0014)	-0.0061*** (0.0014)
Duality	0.0314 (0.0203)	0.0172 (0.0203)	0.0171 (0.0203)
Percentage Independent	-0.0029*** (0.0007)	-0.0013* (0.0007)	-0.0013* (0.0007)
Intercept	0.2735 (0.2169)	0.1013 (0.2037)	0.1286 (0.2076)
Industry Dummies	Yes	Yes	Yes
R-Sq	0.2887	0.3009	0.3011
Number of Observations	9870	9295	9295

This table presents the regressions of the industry adjusted Tobin's Q on the Default Dummy, IndTurnover, turnover interaction (Default Dummy * IndTurnover), E-index, entrenchment interaction (Default Dummy * E-Index) and various control variables for the period 2001 – 2009. The industry adjusted Tobin's Q is calculated as the difference between the firm's Q and its industry median Q. Default spread is calculated as the difference between the average annual yield on Moody's Baa corporate bonds and the average annual yield on Moody's Aaa corporate bonds. In a given year, the default spread dummy variable is defined to be equal to 1 if the default spread is higher than the full sample period median default spread and zero otherwise. IndTurnover is defined as the relative CEO turnover in a given industry in a given year. The E-index is calculated following Bebchuk et al. (2009). Industry is defined following Fama and French 48-industry definition. See Table 18 for details on the control variables. A year random effects model is employed. Industry dummy variables are included to control for unobserved industry specific characteristics. Following White (1980), we compute robust standard errors. Robust standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 24. Excess Turnover, Excess Entrenchment, and the Change in Firm Value

ChangeIndAdjQ	(1)	(2)	(3)
Excess Turnover	0.6808***		0.0482
	(0.2430)		(0.2550)
changee1		-0.0832***	-0.0829***
		(0.0117)	(0.0120)
Firm Size	0.0195	-0.0086	-0.0085
	(0.0160)	(0.0143)	(0.0143)
Capx/AT	0.4038	0.2374	0.2367
	(0.5539)	(0.6715)	(0.6705)
Leverage	0.1620	-0.0038	-0.0041
	(0.1633)	(0.1973)	(0.1970)
Liquidity	0.2952**	0.3334**	0.3337**
	(0.1390)	(0.1355)	(0.1354)
ROA	0.0037	0.0029	0.0029
	(0.0038)	(0.0046)	(0.0046)
Board Size	0.0158*	0.0386***	0.0387***
	(0.0088)	(0.0082)	(0.0082)
CEO AGE	-0.0026	-0.0040*	-0.0040*
	(0.0022)	(0.0021)	(0.0021)
Duality	0.1021***	0.0673**	0.0671**
	(0.0314)	(0.0305)	(0.0305)
Percentage Independent	-0.0070***	-0.0048***	-0.0048***
	(0.0011)	(0.0012)	(0.0012)
Intercept	-0.4256	-0.4023	-0.4038
	(0.3326)	(0.3700)	(0.3702)
Industry Dummies	Yes	Yes	Yes
R-Sq	0.057	0.0821	0.0821
Number of Observations	4052	3299	3299

This table presents the regressions of the ChangeIndAdjQ on ExcessTurnover, ExcessE, and various control variables during the recession period. Based on data from the NBER, we identify 4 recession years: 2001, 2007, 2008, and 2009. ChangeIndAdjQ for each firm in a given recession year is defined as the industry adjusted Tobin's Q less the median industry adjusted Tobin's Q for that firm during the nonrecession period. ExcessTurnover for each firm in a given recession year is defined as relative industry turnover less the median relative industry turnover for that firm during nonrecession years. ExcessE for each firm in a given recession year is defined as the E-index less the median E-index for that firm during nonrecession years. Industry is defined following Fama and French 48-industry definition. See Table 18 for details on the control variables. A year random effects model is employed. Industry dummy variables are included to control for unobserved industry specific characteristics. Following White (1980), we compute robust standard errors. Robust standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 25. Industry Turnover, Managerial Entrenchment, and Firm Value: Two SLS Regressions

IndAdjusted Q	(1)	(2)	(3)
Rdummy	-0.0297 (0.0477)	0.1413*** (0.0457)	0.0706 (0.0663)
IndTurnover	-0.3693 (0.2541)		-0.2803 (0.2528)
Rdummy * IndTurnover	0.8759** (0.3531)		
E-Index		-0.0534*** (0.0107)	-0.0537*** (0.0107)
Rdummy * E-Index		-0.0145 (0.0146)	-0.0124 (0.0147)
Firm Size	0.0153* (0.0088)	0.0160* (0.0088)	0.0164* (0.0088)
Capx/AT	2.0089*** (0.2464)	1.5673*** (0.2560)	1.5670*** (0.2560)
Leverage	-0.0965 (0.0704)	-0.0911 (0.0705)	-0.0937 (0.0705)
Liquidity	0.7778*** (0.0695)	0.6978*** (0.0702)	0.6992*** (0.0702)
ROA	0.0488*** (0.0010)	0.0496*** (0.0010)	0.0496*** (0.0010)
Board Size	-0.0064*** (0.0013)	-0.0066*** (0.0013)	-0.0066*** (0.0013)
CEO AGE	-0.0244*** (0.0053)	-0.0189*** (0.0053)	-0.0190*** (0.0053)
Duality	0.0295 (0.0200)	0.0218 (0.0200)	0.0205 (0.0200)
Percentage Independent	-0.0036*** (0.0007)	-0.0021*** (0.0007)	-0.0021*** (0.0007)
Intercept	0.2248 (0.1736)	0.0722 (0.1744)	0.1050 (0.1779)
Industry Dummies	Yes	Yes	Yes
R-Sq	0.2865	0.3016	0.3018
Number of Observations	9214	8593	8593

This table presents two stage least squares regression to account for any possible endogeneity between: (i) Industry Turnover and Firm Value, and/or (ii) Managerial Entrenchment and Firm Value. The sample period extends from 2001 till 2009. In columns 1 and 3, we use the one period lagged relative industry turnover (LagIndTurnover) and the multiplication of lagged relative industry turnover by the recession dummy variable (Rdummy*LagIndTurnover) as instruments for the relative industry turnover and the industry turnover interaction variable. In columns 2 and 3, we use the one period lag E-index (lagE) and the multiplication of the lag E-index by the recession dummy variable (Rdummy*lagE) as instruments for the E-index and the entrenchment interaction variable. Industry adjusted Tobin's Q is the difference between the firm's Q and its industry median Q. Based on NBER data, we identify 4 recession years: 2001, 2007, 2008, and 2009. Rdummy is a dummy variable equal to 1 if the year is a recession year and 0 otherwise. IndTurnover is defined as the relative CEO turnover in a given industry in a given year. E-index is calculated following Bebchuk et al. (2009). Industry is defined following Fama and French 48-industry definition. See Table 18 for details on the control variables. Industry dummy variables are included to control for unobserved industry specific characteristics. Following White (1980), we compute robust standard errors. Robust standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 26. Industry Turnover, Managerial Entrenchment, and Firm Value: Two SLS Regressions

IndAdjusted Q	(1)	(2)	(3)
Default Dummy	0.0299 (0.0470)	0.2540*** (0.0434)	0.1939*** (0.0633)
IndTurnover	-0.2760 (0.2510)		-0.2525 (0.2482)
Default Dummy * IndTurnover	0.6168* (0.3499)		0.4592 (0.3499)
E-Index		-0.0292*** (0.0096)	-0.0301*** (0.0097)
Default Dummy * E-Index		-0.0540*** (0.0139)	-0.0524*** (0.0140)
Firm Size	0.0165* (0.0088)	0.0189** (0.0088)	0.0188** (0.0088)
Capx/AT	1.9595*** (0.2466)	1.5465*** (0.2563)	1.5476*** (0.2563)
Leverage	-0.1153 (0.0705)	-0.1153 (0.0705)	-0.1158 (0.0705)
Liquidity	0.7752*** (0.0694)	0.7046*** (0.0701)	0.7050*** (0.0701)
ROA	0.0488*** (0.0010)	0.0498*** (0.0010)	0.0498*** (0.0010)
Board Size	-0.0061*** (0.0013)	-0.0062*** (0.0013)	-0.0062*** (0.0013)
CEO AGE	-0.0248*** (0.0053)	-0.0205*** (0.0053)	-0.0204*** (0.0053)
Duality	0.0184 (0.0198)	0.0067 (0.0197)	0.0066 (0.0197)
Percentage Independent	-0.0031*** (0.0007)	-0.0015** (0.0007)	-0.0015** (0.0007)
Intercept	0.1566 (0.1732)	-0.0407 (0.1742)	-0.0116 (0.1775)
Industry Dummies	Yes	Yes	Yes
R-Sq	0.2874	0.3031	0.3032
Number of Observations	9214	8593	8593

This table presents two stage least squares regression to account for any possible endogeneity between: (i) Industry Turnover and Firm Value, and/or (ii) Managerial Entrenchment and Firm Value. The sample period extends from 2001 till 2009. In columns 1 and 3, we use the one period lagged relative industry turnover (LagIndTurnover) and the multiplication of lagged relative industry turnover by the default dummy variable as instruments for the relative industry turnover and the industry turnover interaction variable. In columns 2 and 3, we use the one period lag E-index (lagE) and the multiplication of the lag E-index by the default dummy variable as instruments for the E-index and the entrenchment interaction variable. Industry adjusted Tobin's Q is the difference between the firm's Q and its industry median Q. Default spread is the difference between the average annual yield on Moody's Baa corporate bonds and the average annual yield on Moody's Aaa corporate bonds. In a given year, the default spread dummy variable is defined to be equal to 1 if the default spread is higher than the full sample period median default spread and zero otherwise. IndTurnover is defined as the relative CEO turnover in a given industry in a given year. E-index is calculated following Bebchuk et al. (2009). Industry is defined following Fama and French 48-industry definition. See Table 18 for details on the control variables. Industry dummy variables are included to control for unobserved industry specific characteristics. Following White (1980), we compute robust standard errors. Robust standard errors are reported in parenthesis. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

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