

THE IMPACT OF THE BOARD OF DIRECTORS ON CEO PAY-FOR-PERFORMANCE SENSITIVITY

Dishant Pandya, Spalding University
Ian A. Van Deventer, Spalding University

ABSTRACT

With the hope of strengthening corporate-governance measures following the scandals of Enron, WorldCom, Arthur Andersen, and others, U.S. stock exchanges imposed a rule requiring all companies listed with them to have a majority of independent directors on their boards. We examine, as a natural experiment, the effect of the 2003 change in board composition on CEO pay-for-performance sensitivity. Using change in total compensation with respect to change in shareholder wealth as a proxy for pay-for-performance sensitivity, we find that CEO pay-for-performance sensitivity increases over the long run following the mandate. In contrast with agency theory, the majority of researchers in the U.S. and abroad found no connection between independent board members and CEO pay-for-performance sensitivity. We consider the consequence of the average 3- to 5-year CEO compensation contract negotiated just prior to the independent-board mandate taking effect and collect long-term data spanning 1997-2012. Our results are consistent with agency theory and we argue that, over the long run, outside directors will demand more stringent pay-for-performance incentives that better align CEO compensation packages with shareholder wealth. Our results hold even after controlling for new disclosure requirements, using propensity score matching, and creating a new dependent variable for our pay-for-performance sensitivity calculation.

INTRODUCTION

In 1990, the Gallup Poll reported that people believed CEOs were paid too much compared to the average worker (as cited in Lippert & Porter, 1997). To make matters worse, a series of accounting scandals in the late '90s at Enron, Tyco, and WorldCom, to name a few, shook the confidence of investors and the general public. As a result, legislators passed the Sarbanes-Oxley Act (SOX) in 2002, which strengthened corporate-governance rules. In 2003, at the urging of regulators, the U.S. stock exchanges (Amex, NASDAQ, and NYSE) also made changes to corporate-governance rules. The exchanges required publicly traded companies to change board composition from insider controlled to outsider controlled (the exchange mandate) in the belief that independent directors would be better able to monitor CEOs and align CEO compensation to shareholder wealth.

Since the changes in corporate-governance rules were enacted in 2003, a new body of literature has emerged, providing mixed results that paint an unclear picture of the effect of the board-independence mandate on CEO pay-for-performance sensitivity. Chhaochharia and Grinstein (2009) investigated the impact of the independent-board mandate on CEO incentive pay over the 2000-2005 period and found that both compliant and noncompliant firms reduced CEO incentive pay following the mandate. Their study was repeated by Guthrie et al. (2012) but

excluded two outliers and found no effect of board independence on CEO incentive pay. Chung and John (2017) studied the same period (2000-2005) and found that CEO pay-for-performance sensitivity decreased as board independence increased. Coles et al. (2014), using data spanning 1996-2010, found evidence that as co-optation increased, board monitoring decreased, compensation increased, but found no impact on CEO pay-for-performance sensitivity. We believe the mixed results regarding pay-for-performance sensitivity can be attributed to the timing of contracts negotiated between CEOs and insider-controlled boards, which may have delayed the impact of the board mandate for several years in the U.S.

In the United Kingdom, companies underwent a similar change in board composition in 1992. Guest (2010) investigated the impact of board composition on CEO compensation following. His study spanned 1983-2002 and noted, in contrast to U.S. studies, an increase in pay-for-performance sensitivity. We believe Guest's results can be attributed to the Cadbury Code requirement for independent board members, specifically those serving on Remuneration Committees. Following the global financial crises of 2007, Schultz et al. (2013) examined Australian firms over the period 2000-2010 and found no evidence that independent boards affected CEO pay-for-performance sensitivity. Ndayisaba and Ahmed (2015) studied Australian firms from 2003 to 2013 and also found no impact of board independence on CEO pay-for-performance sensitivity. We believe the prevalence of insider-controlled boards in Australia and lack of an independent-board mandate account for the results of these studies.

The purpose of this paper is to determine whether the 2003 exchange mandate was effective at increasing CEO pay-for-performance sensitivity in the U.S. We contribute to the literature by using long-term data spanning 1997-2012, allowing us to capture average CEO compensation contracts negotiated just prior to the independent-board mandate taking effect. By excluding the Apple and Fossil from our sample of 1,111 companies, we avoid the technical irregularities in the Chhaochharia and Grinstein's (2009) study that rendered their results inconclusive. Similar to Jensen and Murphy (1990), Lippert and Porter (1997), Randoy and Nielsen (2002), Hartzell and Starks (2003), Schultz et al. (2013), and Ndayisaba and Ahmed (2015), we measure pay-for-performance sensitivity as the change in total compensation as a result of a change in the market value of equity. Similar to Duchin et al. (2010) and Guo et al. (2015), we sort firms into two groups based on their board composition level in the year 2000: firms that had to change their board structure (noncompliant firms) and firms that did not have to change their board structure (compliant firms).

Similar to Guest (2010), our results are consistent with agency theory, indicating that an increase in independent board members leads to an increase in CEO pay-for-performance sensitivity over the long run. The results are robust when controlling for new disclosure requirements related to executive compensation announced by the Securities and Exchange Commission (SEC) and the mandate of the Fair Accounting Standards Board (FASB) regarding expensing the options awarded. Our results are robust when using a subsample of control firms using propensity score methodology. Our results also hold after creating a new dependent variable for our pay-for-performance sensitivity calculation.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Agency Theory

Agency theorists believe that CEOs tend to be opportunistic and self-serving (Fan, 2004) and that inside directors make poor monitors because CEOs possess significant influence over inside board members, allowing CEOs to effectively determine the structure of their own compensation packages. Under the supervision of insider-controlled boards, CEOs determine how much of their compensation is non-incentive pay and how much is incentive-based pay (pay-for-performance sensitivity). Additionally, when CEOs own little or no stock in the companies they manage, the temptation to consume company resources for their own benefit is very high (Jensen & Meckling, 1976). This type of relationship results in compensation packages that are out of line with shareholder interests (Bebchuk & Fried, 2004).

Board Independence

Up through the 1960s, most publicly traded firms in the U.S. had boards controlled by insiders who were either officers of the firm or had affiliated business relationships with the firm (Gordon, 2006). Since the collapse of Penn Central in 1976, the number of independent directors serving on boards has been increasing (Gordon, 2006). Following the scandals of the early 21st century, legislators and regulators, siding with agency theorists, decided that much stronger corporate governance was needed to protect shareholders from CEOs and their management. As a result, AMEX, NASDAQ, and NYSE issued announcements in 2003 requiring publicly traded companies to change board composition from insider-controlled to outsider-controlled (one with a majority of independent directors). The monitoring function of boards was increased following the mandate, with independent directors responsible for evaluating management performance, determining management salary (or ratifying and approving salaries if the firm had a compensation committee), and ensuring the integrity of the audit process (Chhaochharia & Grinstein, 2007; Pandya & Van Deventer 2021 a, b).

Prior to the enactment of the independent-board mandate in the U.S. in 2003, the Cadbury Code of 1992 imposed rules on corporate boards in the U.K. It separated the roles of the CEO and Chairman; required a minimum of three non-executive directors on the board; and required that a majority of independent directors serve on the nominations, compensation, and audit committees (Girma et al. 2007). Guest (2010) studied the impact of the mandate over the period 1983-2002 and found significant evidence of an increase in pay-for-performance sensitivity. Guest's results contrast the bulk of the literature pertaining to the impact of board independence on pay-for-performance sensitivity in the U.S. We believe the Cadbury Code's independence mandates, specifically the Compensation Committee, account for the increased CEO pay-for-performance sensitivity.

Other studies were conducted in Australia following the global financial crisis of 2007. Schultz et al. (2013), using a sample of ASX-listed Australian firms over the period 2000 to 2010, found no overwhelming evidence that independent boards impacted CEO pay-for-performance sensitivity. Similarly, Ndayisaba and Ahmed (2015), using ASX-listed Australian firms from 2003 to 2013, found no impact of board independence on CEO pay-for-performance sensitivity. As recommended by Jensen and Murphey (1990) and similar to Hartzell and Starks

(2003), Schultz et al. (2013) and Ndayisaba and Ahmed (2015) measured pay-for-performance sensitivity as the change in total compensation as a result of a change in the market value of equity. When compared to the U.S., most foreign firms have smaller board sizes, a lower fraction of independent directors, a larger proportion of non-independent directors, and a larger percentage of CEOs who also act as chairman (Aggarwal et al., 20008; Schultz et al., 2013; Ndayisaba & Ahmed, 2015). We believe the prevalence of insider-controlled boards and the lack of independent directors serving on compensation committees, accounts for the results of these studies.

The Monitoring Function of the Board

The primary duties of the board of directors include the monitoring and advising of top management (Mace, 1971; Duchin et al., 2010; Coles et al., 2014). In their advising role, directors provide guidance to CEOs regarding the strategic direction of the firm. In their monitoring role, directors establish controls and evaluate the performance of executive managers. Agency theory asserts that strong boards, specifically outsider-controlled boards, are better able to monitor CEOs and to create compensation plans with the necessary incentives (usually in the form of stock grants) to better align the actions of CEOs with shareholder interests (Hartzell & Starks, 2003; Coles et al., 2014).

The traditional monitoring role of the board was strengthened in the U.S. as a result of a series of accounting scandals that took place in the late 1990s: Enron, Tyco, and WorldCom, to name a few. Legislators quickly passed the Sarbanes-Oxley Act (SOX) on July 30, 2002, which altered corporate-governance rules. Firms must adopt a majority of independent directors; independent directors must meet regularly without management; the nominating committee, compensation committee, and audit committee must have exclusively independent directors, independent directors must meet strict independence requirements, and members of the audit committee must be financially literate with at least one financial expert and have broadened responsibilities (Chhaochharia & Grinstein, 2007; Pandya & Van Deventer 2021 a, b). The Securities and Exchange Commission (SEC) adopted these rules to enhance corporate-governance practices and, thereby, restore investor confidence in the stock market (Bhagat & Bolton, 2008; Rutledge, Karim, & Lu, 2016).

The 2002 Independent-Board Mandate

Among the first to study the U.S. mandate and its effects on CEO pay are Chhaochharia and Grinstein (2009). They used data spanning 2000 to 2005 and find that CEO compensation decreased with an increase in independent board members. In 2012, Guthrie et al. repeated the Chhaochharia and Grinstein study but excluded two outliers, Steve Jobs of Apple and Kosta Kartsofis of Fossil, due to their unusual changes in pay during the study time frame. Unlike Chhaochharia and Grinstein, Guthrie et al. (2012) found no effect of board independence on CEO pay. Coles et al. (2014), using data spanning 1996-2010, investigated whether independent directors appointed by the CEO demonstrated allegiance to the CEO (co-opted independence) and decreased monitoring. They found evidence that as co-option increased, board monitoring decreased, and compensation increased; but, in contrast with our findings, Coles et al. found no impact on CEO pay-for-performance sensitivity. We agree with the findings that independent directors serving on the board prior to the current CEO may make effective monitors; but, unlike

Coles et al. we found that adding independent directors increased monitoring and increased CEO pay-for-performance sensitivity. We contend that, as a result of SOX and stock-exchange requirements, independent directors will be less friendly to tenured CEOs. We also believe a long-term study is needed that extends beyond 2010 in order to capture all firms that were affected by the exchange mandate.

Similar to Guthrie et al. (2012), Chung and John (2017) studied the 2000-2005 timeframe; but they found that board independence decreased CEO pay-for-performance sensitivity. In contrast with Guthrie et al. and Chung and John, we found that an increase in independent directors increased monitoring and increased CEO pay-for-performance sensitivity. We believe their results were due chiefly to the short-term nature of their studies. The researchers use similar data captured over the same period of time; however, by the end of 2005, the effect of the mandate had not yet been felt on the typical three- or five-year CEO compensation contract (Parrino et al. 2009). It is possible that some savvy CEOs renegotiated their contracts just prior to outside directors taking control and further delaying the adoption of pay-for-performance measures by independent-controlled boards for up to 3-5 years until 2008-2010.

Empirical evidence on the impact of independent directors on CEO pay-for-performance sensitivity is mixed. In some countries, the mixed results can be attributed to a lack of board independence. We believe the mixed results found in U.S. literature can be attributed to the timing of contracts negotiated between CEOs and insider-controlled boards. We believe the model for corporate leadership reform presented in the 1992 Cadbury Code of the U.K. was a guide for U.S. regulators to follow. Given that U.S. regulators placed a greater emphasis on independent-controlled boards and increased monitoring powers of independent directors than they did in the U.K. in 1992, we hypothesize that pay-for-performance sensitivity will increase as firms change board composition following the mandate. The null hypothesis is consistent with the window-dressing view introduced by Romano (2005). Romano asserts that no change will be observed as a result of this mandate because CEOs will simply invite their friends to become independent board members.

RESEARCH METHOD

Data

The data for this study was extracted from three sources. Information regarding CEO compensation for S&P 1500 firms was extracted from ExecuComp for 1997-2012. Information regarding the board of directors comes from RiskMetrics which tracked the records of S&P 1500 firms from 1996 to 2009. This information was matched with the financial information of publicly traded companies in the U.S., provided by CompuStat from 1997 to 2012. We removed Apple and Fossil from the data, as Guthrie et al. (2012) have shown that these companies biased the results of investigating CEO pay-for-performance sensitivity during this time period. Our sample consists of firms that provided at least 10 years of data following the 2002 independent-board mandate. We removed firms from our sample that did not survive through 2012 because they did not survive long enough after the mandate to provide long-term data for this study. This gave us 1,111 publicly traded companies for our sample. All data was winsorized at the top and bottom percentiles.

Endogeneity

Controlling for endogeneity is an important issue when studying the impact of board composition (Hermalin & Weisbach, 2003). We were able to avoid endogeneity concerns by analyzing the results of a natural experiment, the exchange mandate of 2003, on noncompliant firms against a control group of compliant firms (Adams et al., 2010). Specifically, the U.S. independent-board mandate made it possible to ease concerns that changes in board composition could be attributed to unobservable CEO characteristics.

Variables

To confirm the hypothesis that independent boards are better at increasing pay-for-performance sensitivity, we investigate the impact of the change in shareholder wealth on the relative change in total CEO compensation in noncompliant firms by estimating the following pay-for-performance sensitivity (PPS) equation: $\Delta Total Compensation_{(i,t)} = \alpha + \beta_1(Inside Board_i Post Regulation_t) + \beta_2 (\Delta Shareholder Wealth_{(t-1)}) + \beta_3 (\Delta Shareholder Wealth_{(t-1)} * Inside Board_i * Post Regulation_t) + \delta_i + Y_t + \Gamma X_{(i,t)} + \varepsilon_{(i,t)}$.

The dependent variable, $\Delta Total Compensation$, is defined as the dollar change in the current total CEO compensation from the previous year. Total compensation is the sum of all salaries, bonuses, stock options, restricted stock grants, and other compensation awarded to the CEO during the fiscal year (Bebchuk & Grinstein, 2005; Fahlenbrach, 2009; Chhaochharia & Grinstein, 2009; Coles et al., 2014).

Inside Board is a constant variable indicating the compliant and noncompliant groups based on board composition prior to the board independence mandate. It is defined as those firms that have a majority of inside directors in 2000, similar to Chhaochharia and Grinstein (2007), Duchin et al. (2010), and Guo et al. (2015). The independent-board mandate went into effect in 2003 but was announced as early as February 27, 2002 (Guo et al., 2015). Many companies operated with fiscal years that began in 2001, such as July 01, 2001 to June 30, 2002 (Guo et al., 2015). Because some firms began fiscal periods in 2001, they may have been influenced by the exchange mandate announced in early 2002. For this reason, we use the year 2001 as the shock year and the year 2000 is preferred for grouping compliant and noncompliant firms (Guo et al., 2015). The noncompliant firms consist of all firms that were insider-controlled in 2000 and would be affected by the exchange mandate. Firms that were already outsider-controlled in 2000 would not be affected by the exchange mandate are grouped as compliant firms. The value for *Inside Board* is equal to 1 if the ratio of inside directors to the total number of directors is equal to or greater than 0.5 at the end of fiscal year 2000; the value is 0 if the ratio is less than 0.5.

Post Regulation is a dummy variable equal to 1 for the year 2002 and beyond. Since some companies preemptively changed board composition to outside boards in the announcement year, we use the year 2002 as the event year (see Guo et al., 2015).

Following Hartzell and Starks (2003), we calculate *Shareholder Wealth*, also known as the market value of equity, as shares outstanding (in millions) times the fiscal year-end stock price. A change in shareholder wealth ($\Delta Shareholder Wealth$) is defined as the variation in market value of equity from the previous to the current year.

Jensen and Murphy (1990) argued that compensation plans that vary the total pay with performance changes provide better management incentives. We measure pay-for-performance sensitivity as the change in total compensation ($\Delta Total Compensation$) as a result of changes in

the market value of equity (similar to Hartzell & Starks, 2003). The coefficient of the three-term interaction term, β_3 , indicates the relative change in the sensitivity of changes in total CEO compensation following the mandate to changes in shareholder wealth for noncompliant firms.

Adding control variables ($X_{(i,t)}$) limits cross-sectional and time-series variations. Firm-specific control variables include *Total Sales*, *Return on Assets*, and *Annual Returns*, similar to Jensen and Murphy (1990), Bebchuk and Grinstein (2005), Chhaochharia and Grinstein (2009), Guthrie et al. (2012), and Coles et al. (2014). *Total Sales* is used to measure firm size and is defined as the natural logarithm of total sales. We calculate *Return on Assets* as the natural log of return on assets and *Annual Returns* as the natural log of annualized holding period returns to control for firm performance. All control variables are lagged by one year to avoid the endogeneity concern, the effect that compensation has on size and performance. Table 1 provides more information about the variables.

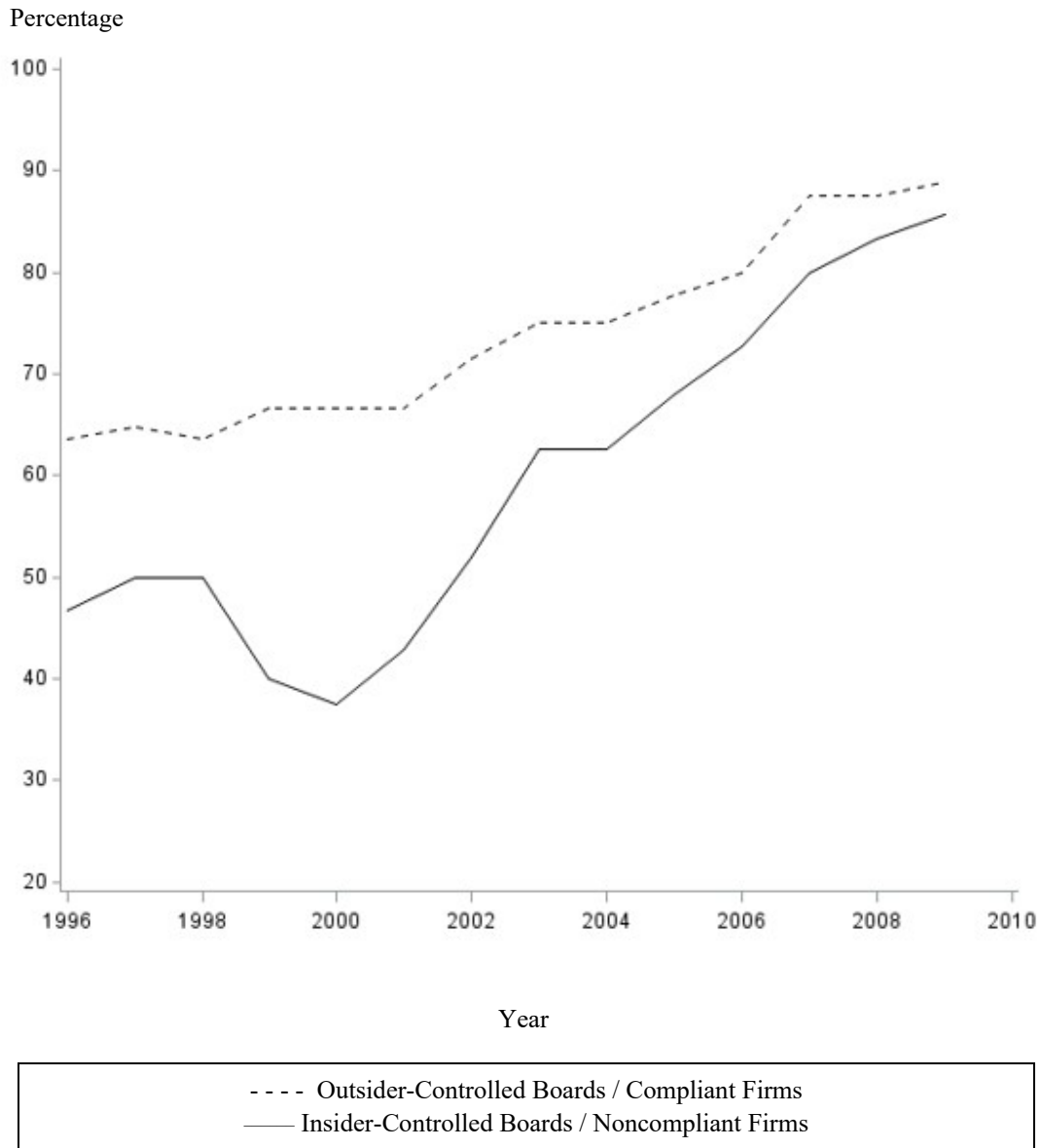
As recommended by Graham et al. (2012), we use firm-fixed effects (δ_i) to control for unobservable cross-sectional factors such as firm culture, CEO seniority, and current board composition. We also use year fixed effects (γ_t) to control for unobservable time-invariant factors. We cluster the standard errors at the firm level and use robust and heteroscedasticity-consistent standard errors. Alpha is the intercept term, which is suppressed to avoid the dummy variable trap, similar to Adams and Ferreira (2009), and epsilon is the error term.

Table 1 Variable Definitions		
Variable	Source	Definition
Annual Return	CompuStat	Annualized holding period return during the fiscal year
ΔShareholder Wealth	CompuStat	The dollar change calculated as the fiscal year end stock price times shares outstanding (in millions) from previous year to the current year
ΔTotal Compensation	ExecuComp	Difference between current Total Compensation and last year's Total Compensation
Extraordinary Income	CompuStat	Net income before extraordinary items at the end of the year
Inside Board	Risk Metrics	1 if the firm has an insider-controlled board in the year 2000 (percentage of outsiders has to be less than 50%)
Post Regulation	-	1 for the years 2002 and beyond following the announcement of new exchange-listed requirements
Return on Assets	CompuStat	Extraordinary Income / Total Assets
Shares Outstanding	CompuStat	Net number of all common shares outstanding at year end (in millions)
Stock Price	CompuStat	Fiscal year-end price for a company's stock
Total Compensation	ExecuComp	The value listed under the variable tdc1 in the ExecuComp database
Total Sales	CompuStat	Net sales at the end of the year

Exogenous Shock

We used the difference-in-difference (DD) estimation method suggested by Roberts and Whited (2013), which approximates the results of an exogenous shock by comparing the performance of non-compliant firms with compliant firms and removes factors that affected both groups around the time of the mandate. To visualize the exogenous shock on board composition, the median percentage of outside directors for 1996–2009 is plotted in Figure 1. The dotted line indicates compliant firms, and the solid line indicates noncompliant firms. Figure 1 indicates that there was a significant difference in board composition between the two groups prior to 2000. For instance, in 2000, the median percentage of outsiders in an insider-controlled firm was less than 40%; by 2009, this figure had increased to more than 70%. Firms compliant before the new regulation showed a more modest increase (from 65% to 75%, equivalent to adding one more independent director). The figure shows why firms with outsider-controlled boards in the year 2000 are an obvious control group in this research.

Figure 1
Median Percentage of Directors



Full Sample Summary Statistics

Column 1 of Table 2 reports the results for the full sample of 1,111 publicly traded firms with 14,295 annual observations. On average, firms have annual total sales of nearly \$6.6 billion, annual shareholder wealth of \$9.1 billion with an average annual decrease of \$15 million, an annual rate of return on assets of 3.7%, and an annual stock return of 13.6%. The average annual total CEO compensation package is approximately \$5.7 million.

Table 2				
Full Sample Summary Statistics				
	(1)	(2)	(3)	(4)
	All Firms	Inside Board in Year 2000	Independent Board in Year 2000	T-Statistics
Number of Firms	1,111	244	867	
Number of Observations	14,295	3,069	11,226	
Total Sales (in millions)	\$6,593	\$3,778	\$7,362	3.79***
Shareholder Wealth (in millions)	\$9,113	\$4,910	\$10,262	3.56***
ΔShareholder Wealth (in millions)	-\$15	-\$385	\$85	2.30**
Return on Assets	3.74%	4.30%	3.59%	1.56
Annual Return	13.57%	13.92%	13.47%	0.43
Total Compensation (in thousands)	\$5,655	\$4,521	\$5,964	3.98***
<p>Column 1 shows the summary statistics for the full sample. Column 2 represents the summary statistics for firms with inside boards in year 2000. Column 3 provides summary statistics for firms with independent boards in year 2000. Column 4 shows the absolute value for the t-statistics between Independent Board and Inside Board clustered at firm levels. The statistics include total sales, shareholder wealth, and change in shareholder wealth (all in millions of dollars), average return on assets and average holding period return. The table also includes the total compensation (in 000s of dollars). All variables are winsorized at the top and bottom percentile. The information is from fiscal years 1997–2012. Statistical significance at 10%, 5%, and 1% is denoted by *, **, and ***, respectively.</p>				

Columns 2 and 3 separate the noncompliant and compliant firms, respectively. Of the 1,111 firms, 244 had insider-controlled boards. On average, these firms have total annual sales of \$3.8 billion, annual shareholder wealth of \$4.9 billion with an annual decrease of \$385 million, an annual return on assets of 4.3%, and an annual stock return of 13.9%. The average annual total CEO compensation package is \$4.6 million. The other 867 firms have outsider-controlled boards. On average, these firms have annual sales of \$7.4 billion, annual shareholder wealth of \$10.3 billion with an annual average increase of \$85 million, an annual return on assets of 3.6%, and an annual stock return of 13.5%. The average annual total CEO compensation package for these firms is \$6 million. As shown by the *t*-statistics in column 4, noncompliant firms are significantly smaller than compliant firms both in terms of sales (3.79) and shareholder wealth as measured by market capitalization (3.56) but experience a greater return on assets (1.56) and market return (0.43) than outsider-controlled firms do (but not statistically different).

Propensity Score Matching

The model employed in the PPS equation assumes that noncompliant firms are similar to compliant firms. Column 4 of Table 2 above, presents statistically significant differences between the noncompliant and compliant firms based on firm size as measured by Total Sales and Shareholder Wealth. Even if these variables are controlled in the PPS equation, doing so

may not address observable differences. We use propensity score matching to show that changes to pay-for-performance sensitivity are not the result of these observable differences. We employ one-to-one propensity score matching with replacement methodology following Lu and Wang (2018).

We find a concordance rate of 72.3%, which is well above the 50% rate associated with no predictive power. Using the predicted values from the logit regression, we apply a nearest-neighbor propensity score matching methodology, yielding a matched sample of 412 firms (236 firms with noncompliant boards and 176 firms with compliant boards).

Table 3 Logit Model for the Probability of an Inside Board	
Ln (Total Sales)_{t-1}	-0.174*** (0.034)
Ln (ROA)_{t-1}	1.194** (0.516)
Ln (Annual Return)_{t-1}	-14.548 (9.376)
Percent Concordant	72.3%
Chi Square	716.03
Firm Dummy	YES
Year Dummy	YES
Number of Observations	4,143
<p>Table 3 reports the coefficient estimates of a logit model where firms that had an insider-controlled board in the year 2000 represent the dependent variable. Independent variables include all continuous control variables, as well as firm and year fixed effects. The dependent variable is 1 if the firm has majority of insider directors in the year 2000 and 0 otherwise. The sample consists of all firm years from 1997–2000. All variables are winsorized at the top and bottom percentile. All regressions use firm and year fixed effects. Standard errors reported in parentheses are heteroscedasticity consistent and clustered at firm levels. Intercept has been suppressed to avoid the dummy variable trap. Statistical significance at 10%, 5%, and 1% is denoted by *, **, and ***, respectively.</p>	

Column 1 of Table 4 shows the summary statistics for the matched sample of 412 publicly traded firms with 5,291 annual observations. On average, firms have total annual sales of \$4.2 billion, annual shareholder wealth of \$5.5 billion that decreased on average by almost \$366 million annually, an annual return on assets of 4.3%, and an annual stock return of 13.5%. The average annual total CEO compensation package is nearly \$5 million.

Table 4				
Matched Sample Summary Statistics				
	(1)	(2)	(3)	(4)
	All Firms	Noncompliant in Year 2000	Compliant in Year 2000	T-Statistics
Number of Firms	412	236	176	
Number of Observations	5,291	2,991	2,300	
Total Sales (in millions)	\$4,223	\$3,794	\$4,781	1.06
Shareholder Wealth (in millions)	\$5,481	\$4,927	\$6,201	1.12
ΔShareholder Wealth (in millions)	-\$366	-\$393	-\$330	0.25
Return on Assets	4.31%	4.32%	4.30%	0.04
Annual Stock Returns	13.49%	13.95%	12.88%	0.76
Total Compensation (in thousands)	\$4,984	\$4,517	\$5,591	2.46**
<p>Column 1 presents the summary statistics for the matched sample. Column 2 shows summary statistics for the treatment firms. Column 3 provides the summary statistics for the control firms in year 2000. Column 4 shows the absolute value of t-statistics between Independent Board and Inside Board clustered at firm levels. The statistics include total sales, shareholder wealth, and change in shareholder wealth (all in millions of dollars), average return on assets and average holding period return. The table also includes the total compensation (in 000s of dollars). All variables are winsorized at the top and bottom percentile. The information on the firm is from fiscal years 1997–2012. Statistical significance at 10%, 5%, and 1% is denoted by *, **, and ***, respectively.</p>				

Columns 2 and 3 separate the noncompliant and compliant firms, respectively. Of the 412 firms, 236 have insider-controlled boards. On average, these firms have total annual sales of \$3.8 billion, annual shareholder wealth of \$4.9 billion that decreased on average by \$393 million annually, an annual return on assets of 4.3%, and annual stock returns of 14%. The average annual total CEO compensation package for these firms is \$4.5 million. The other 176 firms have outsider-controlled boards. On average, these firms have annual sales of \$4.8 billion, annual shareholder wealth of \$6.2 billion that decreases by an average of \$330 million annually, an annual return on assets of 4.3%, and an annual stock return of 12.9%. The average annual total CEO compensation package was \$5.6 million.

As shown by the t-statistics in column 4, there is no statistically significant difference in the overall size of compliant and noncompliant firms in terms sales (1.06) and shareholder wealth (1.12), unlike in Table 2. Total compensation for CEOs of noncompliant firms is still significant and lower than those of compliant firms.

RESULTS

In Table 5, the coefficients for $\Delta(\text{Shareholder Wealth})_{t-1}$ are negative at 3 and 5 years (-0.004, -0.003) but are positive at 7 and 10 years (0.008, 0.011), providing some evidence that

pay-for-performance sensitivity increased over time and over the long run for all CEOs following the mandate. The coefficients for the three-term interaction variable $\Delta \text{Shareholder Wealth}_{(t-1)} * \text{Inside Board}_i * \text{Post Regulation}_t$ are positive (0.202, 0.210, 0.130, 0.123) and statistically significant at 3, 5, 7, and 10 years, providing strong evidence that increases in pay-for-performance sensitivity are greater for CEOs of noncompliant firms. These results differ from the short-term results of Chung and John (2017), who found that outside directors did not change the incentive pay following the mandate. The lack of significance for their pay-for-performance-sensitivity variable in their study could be attributed to the shorter time frame of their analysis. The results here indicate that the use of a long-run survivor sample may find a different impact of the mandate on CEO pay-for-performance sensitivity. In terms of long-term economic significance, noncompliant boards increased the pay-for-performance sensitivity of the average CEO by \$0.123 for every \$1,000 increase in shareholder wealth.

Table 5				
Main Full Sample Results for CEO Pay-for-Performance Sensitivity				
	2005	2007	2009	2012
	Short-Term Results after 3 Years	Short-Term Results after 5 Years	Short-Term Results after 7 Years	Long-Run Results after 10 Years
Inside Board*Post Regulation	580.17** (246.35)	387.06* (219.81)	538.76*** (209.54)	491.46** (200.74)
Ln (Total Sales)_{t-1}	-1,907*** (118.79)	-1,898*** (110.91)	-1,831*** (108.33)	-1,693*** (101.32)
Ln (Return on Assets)_{t-1}	3,064** (1,285)	2,313** (1,139)	1,733* (887.49)	1,379* (778.98)
Ln (Annual Return)_{t-1}	37,890** (16,636)	32,306** (15,466)	33,352** (14,214)	33,439*** (11,936)
$\Delta(\text{Shareholder Wealth})_{t-1}$	-0.004 (0.010)	-0.003 (0.009)	0.008 (0.009)	0.011 (0.009)
Inside Board in Year 2000*Post Regulation*$\Delta(\text{Shareholder Wealth})_{t-1}$	0.202** (0.081)	0.210** (0.092)	0.130* (0.077)	0.123* (0.065)
Observations	8,282	10,168	11,891	14,295
R²	0.117	0.093	0.081	0.073
Firm Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES
Number of Firms	1,111	1,111	1,111	1,111
This table shows the results for the least square regression analysis of the effects of the new exchange regulations on CEO pay-for-performance sensitivity for all surviving firms during the period 1997–2012. We provided short-term to long-term results at 3 years in 2005, 5 years in 2007, 7 years in 2009, and 10 years in 2012. All variables are winsorized at the top and bottom percentile. All regressions use firm and year fixed effects. Standard errors reported in parentheses are heteroscedasticity consistent and clustered at firm levels. Intercept has been suppressed to avoid the dummy variable trap. Statistical significance is denoted at the 10%, 5%, and 1% levels by *, **, and ***, respectively.				

ROBUSTNESS CHECKS

Matched Subsample

Similar to Guo et al. (2015), we performed a robustness check using a subsample of matched noncompliant and compliant firms to determine how similar firms that differed in board independence prior to the mandate adjusted their CEO pay-for-performance sensitivity following the mandate. The results are presented in Table 6, which re-estimates the interaction term using the matched subsample. The interaction term $\Delta \text{Shareholder Wealth}_{(t-1)} * \text{Inside Board}_i * \text{Post Regulation}_i$ (0.124) is still positive and statistically significant, suggesting that new independent boards increase the CEO pay-for-performance sensitivity of noncompliant firms.

Table 6	
Robustness Checks for CEO Pay-for-Performance Sensitivity using a Matched Subsample	
Inside Board*Post Regulation	582.68*** (214.68)
Ln (Total Sales)_{t-1}	-1,684*** (111.11)
Ln (Return on Assets)_{t-1}	1,584* (839.64)
Ln (Annual Return)_{t-1}	37,035*** (12,866)
$\Delta(\text{Shareholder Wealth})_{t-1}$	0.009 (0.009)
Inside Board in Year 2000*Post Regulation*$\Delta(\text{Shareholder Wealth})_{t-1}$	0.124** (0.060)
Observations	11,618
R²	0.092
Firm Dummy	YES
Year Dummy	YES
Number of Firms	1,111
<p>In this table, we also used propensity score matching to find firms that had similar characteristics based on the nearest neighbor methodology with one-to-one replacement. All variables are winsorized at the top and bottom percentile. All regressions use firm and year fixed effects. Standard errors reported in parentheses are heteroscedasticity consistent and clustered at firm levels. Intercept has been suppressed to avoid the dummy variable trap. Statistical significance is denoted at the 10%, 5%, and 1% levels by *, **, and ***, respectively.</p>	

New Disclosure Requirements

Our data was impacted by new disclosure requirements for stock options. In 2004, the Fair Accounting Standards Board (FASB) published FAS 123R, requiring firms to expense stock options differently than before. Specifically, firms are required to expense options at fair market

value (see Appendix B in Coles et al., 2014, for details). The SEC mandate expanded disclosure guidelines for executive compensation at the same time. The majority of the companies switched to the new format for reporting stock options in 2006, and the remaining companies did so in 2007. To deal with this issue, Coles et al. (2014) suggested removing data for the first year when firms switched to new reporting standards from the analysis. These results indicate that changes in disclosure requirements do not explain the increase in pay-for-performance sensitivity for CEOs of noncompliant firms following the mandate.

	1	2
Inside Board*Post Regulation	693.73*** (269.10)	796.13*** (286.61)
Ln (Total Sales)_{t-1}	-1,608*** (167.31)	-1,605*** (189.14)
Ln (Return on Assets)_{t-1}	283.92 (1,184)	656.45 (1,316)
Ln (Annual Return)_{t-1}	27,117 (17,670)	28,684 (19,741)
Δ(Shareholder Wealth)_{t-1}	0.004 (0.012)	0.000 (0.014)
Inside Board in Year 2000*Post Regulation*Δ(Shareholder Wealth)_{t-1}	0.134** (0.067)	0.136** (0.062)
Observations	5,291	4,310
R²	0.087	0.108
Firm Dummy	YES	YES
Year Dummy	YES	YES
Number of Firms	412	412
<p>In columns 1 and 2, we removed the first year that firms switched to the new disclosure requirements from the analysis. In column 2, we also used propensity score matching to find firms that had similar characteristics based on the nearest neighbor methodology with one-to-one replacement. All variables are winsorized at the top and bottom percentile. All regressions use firm and year fixed effects. Standard errors reported in parentheses are heteroscedasticity consistent and clustered at firm levels. Intercept has been suppressed to avoid the dummy variable trap. Statistical significance is denoted at the 10%, 5%, and 1% levels by *, **, and ***, respectively.</p>		

In column 1 of Table 7, we removed the first year that firms switched to the new disclosure requirements from the sample and re-ran the analysis. The interaction term, *Inside Board in Year 2000*Post Regulation*Δ(Shareholder Wealth)_{t-1}* (0.134) is still positive and significant. In column 2, we applied propensity score matching and also removed the first year that firms switched to the new disclosure requirements from the sample and ran the analysis again. The interaction term, *Inside Board in Year 2000*Post Regulation*Δ(Shareholder Wealth)_{t-1}* (0.136) is still positive and significant. The results in Table 7 columns 1 and 2

indicate that the summary statistics presented in Tables 2 and 4 were not due to differences between the compliant and noncompliant groups.

Murphy Pay-for-Performance Sensitivity Calculation

In Table 8, we followed the examples of Murphy (1993) and Lippert and Porter (1997) and created a yearly pay-for-performance dependent variable by taking the ratio of change in total compensation to change in shareholder wealth. Using this calculation eliminates the need to compute a triple difference measure. The difference-in-difference measure (3.178) is positive and significant, which is consistent with the main results in Table 5. The new independent board increases CEO pay-for-performance sensitivity following the U.S. stock exchange mandate.

Table 8 Robustness Check using the Murphy Pay-for-Performance Sensitivity Calculation	
Inside Board*Post Regulation	3.178* (1.81)
Ln (Total Sales)_{t-1}	-0.500 (0.962)
Ln (Return on Assets)_{t-1}	37.505 (28.59)
Ln (Annual Return)_{t-1}	-69.885 (296.25)
Observations	14,295
R²	0.067
Firm Dummy	YES
Number of Firms	1111
<p>In this table, we followed the examples of Murphy (1993) and Lippert and Porter (1997) and created a yearly pay-for-performance dependent variable by taking the ratio of change in total compensation to change in shareholder wealth. All variables are winsorized at the top and bottom percentile. All regressions use firm and year fixed effects. Standard errors reported in parentheses are heteroscedasticity consistent and clustered at firm levels. Intercept has been suppressed to avoid the dummy variable trap. Statistical significance is denoted at the 10%, 5%, and 1% levels by *, **, and ***, respectively.</p>	

CONCLUSION

In this paper, we investigate the impact of changes in board composition on CEO pay-for-performance sensitivity as a result of the U.S. exchange mandate of 2003. The general results indicate that there is an increase in CEO pay-for-performance sensitivity over the long run for noncompliant firms compared to compliant firms. These results are inconsistent with the short-run results found by Guthrie et al. (2012) and Chung and John (2017) but are consistent with the expectations of agency theory.

Policy Implications

The results of our study support the actions of legislators and regulators in the U.S. who strengthened oversight rules through the SOX Act of 2002 and mandated independent boards through the stock exchanges in 2003. Independent boards, with strengthened powers, are better able to align CEO compensation to company performance and shareholder wealth. As Jensen and Murphy (1990) pointed out in their paper and Warren Buffet adeptly informed Forbes (May, 28, 1990, as cited in Lippert & Porter, 1997), the amount of CEO compensation is unimportant compared to whether it is properly based on company performance. According to Aggarwal et al. (2008), only 33 percent of foreign companies are controlled by boards with a majority of independent directors and only 29 percent of foreign companies have compensation committees comprised solely of independent directors. The corporate governance policies resulting from SOX and the U.S. stock exchanges provide examples for regulatory agencies in other countries to follow should they seek to align CEO compensation to company performance and shareholder wealth.

Further Research

We know that independent boards are using the pay-for-performance component of the total CEO compensation package to align CEO interests with that of shareholders. We also now know that an increase in board independence leads to an increase in CEO pay-for-performance sensitivity over an extended period of time. We do not yet know if this pay-for-performance increase will have the desired effect of reining in CEO compensation. Further research could examine the impact of the mandated change in board composition on total CEO compensation over the long term.

ACKNOWLEDGMENTS

We thank Dr. Wei Wang for access to the data.

REFERENCES

- Adams, R. B., and Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of financial economics*, 94(2), 291-309.
- Adams, R. B., Hermalin, B. E., and Weisbach, M. S. (2010). The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, 48(1), 58-107.
- Aggarwal, R., Erel, I., Stulz, R., and Williamson, R. (2008). Differences in governance practices between U.S. and foreign Firms: Measurement, causes, and consequences. *The Review of Financial Studies*, 22(8), 3131-3169.
- Bebchuk, L., and Fried, J. (2004). *Pay without performance: The Unfulfilled Promise of Executive Compensation*. Cambridge, MA: Harvard University Press.
- Bebchuk, L., and Grinstein, Y. (2005). The growth of executive pay. *Oxford review of economic policy*, 21(2), 283-303.
- Bhagat, S., and Bolton, B. (2008). Corporate governance and firm performance. *Journal of Corporate Finance*, 14(3), 257-273.

- Chhaochharia, V., and Grinstein, Y. (2007). Corporate governance and firm value: The impact of the 2002 governance rules. *The Journal of Finance*, 62(4), 1789-1825.
- Chhaochharia, V., and Grinstein, Y. (2009). CEO compensation and board structure. *The Journal of Finance*, 64(1), 231-261.
- Chung, H. J., and John, K. (2017). Board independence, CEO ownership, and compensation. *Asia-Pacific Journal of Financial Studies*, 46(4), 558-582.
- Coles, J. L., Daniel, N. D., and Naveen, L. (2014). Co-opted boards. *The Review of Financial Studies*, 27(6), 1751-1796.
- Duchin, R., Matsusaka, J. G., and Ozbas, O. (2010). When are outside directors effective? *Journal of Financial Economics*, 96(2), 195-214.
- Fan, P. S. (2004). Review of literature & empirical research on corporate governance. *Financial services group training unit monetary authority of Singapore*.
- Fahlenbrach, R. (2009). Shareholder rights, boards, and CEO compensation. *Review of Finance*, 13(1), 81-113.
- Girma, S., and Thompson, R. S., and Wright, Peter W. (2007). Corporate governance reforms and executive compensation determination: Evidence from the UK. *Manchester School*, 75(1), 65-81.
- Gordon, J. N. (2006). The rise of independent directors in the United States, 1950-2005: Of shareholder value and stock market prices. *Stanford Law Review*, 59(6), 1465-1568.
- Graham, J. R., Li, S., and Qiu, J. (2012). Managerial attributes and executive compensation. *The Review of Financial Studies*, 25(1), 144-186.
- Guest, P. M. (2010). Board structure and executive pay: Evidence from the UK. *Cambridge Journal of Economics*, 34(6), 1075-1096.
- Guo, L., Lach, P., and Mobbs, S. (2015). Tradeoffs between internal and external governance: evidence from exogenous regulatory shocks. *Financial Management*, 44(1), 81-114.
- Guthrie, K., Sokolowsky, J., and Wan, K. M. (2012). CEO compensation and board structure revisited. *The Journal of Finance*, 67(3), 1149-1168.
- Hartzell, J. C., and Starks, L. T. (2003). Institutional investors and executive compensation. *The journal of finance*, 58(6), 2351-2374.
- Hermalin, B. E., and Weisbach, M. S., (2003). Boards of directors as an endogenously determined institution: A survey of the economic literature. *Federal Reserve Bank of New York Economic Policy Review*, 9(1), 7-26.
- Jensen, M. C., and Meckling, W. H. (1976). Agency costs and the theory of the firm. *Journal of Financial Economics*, 3(4), 305-360.
- Jensen, M. C., and Murphy, K. J. (1990). CEO incentives—It's not how much you pay, but how. *Journal of Applied Corporate Finance*, 22(1), 64-76.
- Lippert, R., and Porter, G. (1997). Understanding CEO pay: A test of two pay-to-performance sensitivity measures with alternative measure of alignment and influence. *Journal of Business Research*, 40, 127-138.
- Lu, J., and Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, 48, 1-16.
- Mace, M. L. (1971). *Directors: Myth and reality*. Boston, MA: Harvard Business School Press.
- Murphy, K. J. (1993). Executive compensation in corporate America 1993. *United Shareholders Association*, 1993.
- Ndayisaba, G., and Ahmed, A. D. (2015). CEO remuneration, board composition and firm performance: empirical evidence from Australian listed companies. *Corporate Ownership & Control*, 13 (1-5), 534-552.
- Pandya, D., and Van Deventer, I. A. (2021 a). The effect of Strengthened Corporate Governance on Firm Performance in the United States. *Journal of Accounting, Business and Finance Research*, 12(2), 26-31.
- Pandya, D., and Van Deventer, I. A. (2021 b). The effect of strengthened monitoring and oversight mechanisms on U.S. firms listed on NASDAQ. *Research Journal of Finance and Accounting*, 12(16), 15-20.
- Parrino, R., Gillan, S. L., and Hartzell, J. C. (2009). Explicit vs. implicit contracts: Evidence from CEO employment agreements. *The Journal of Finance*, 64(4), 3.
- Randoy, T., and Nielsen, J. (2002). Company performance, corporate governance, and CEO compensation in Norway and Sweden. *Journal of Management and Governance*, 6, 57-81.
- Roberts, M. R., & Whited, T. M. (2013). Endogeneity in empirical corporate finance. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the Economics of Finance*, 2A, 493-572. Netherlands: Elsevier.
- Romano, R. (2005). The Sarbanes-Oxley Act and the making of quack corporate governance. *Yale Law Journal*, 114, 1521-1611.

- Rutledge, R. W., Karim, K. E., & Lu, S. (2016). The effects of board independence and CEO duality on firm performance: Evidence from the NASDAQ-100 Index with controls for endogeneity. *Journal of Applied Business and Economics*, 18(2), 49-71.
- Schultz, E., Tian, G., and Twite, G. (2013). Corporate governance and the CEO pay-performance link: Australian Evidence. *International Review of Finance*, 13(4), 447-72.