

CEO Compensation and Board Structure

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ABSTRACT

In response to corporate scandals in 2001 and 2002, major U.S. stock exchanges issued new board requirements to enhance board oversight. We find a significant decrease in CEO compensation for firms that were more affected by these requirements, compared with firms that were less affected, taking into account unobservable firm effects, time-varying industry effects, size, and performance. The decrease in compensation is particularly pronounced in the subset of affected firms with no outside blockholder on the board and in affected firms with low concentration of institutional investors. Our results suggest that the new board requirements affected CEO compensation decisions.

IN MODERN CORPORATIONS, the decision of how to compensate the manager is delegated to the board of directors. In recent years, experts have debated the importance of this delegation mechanism in affecting CEO compensation. On the one hand, many scholars point to the labor market for talent as the major force that determines the level and design of compensation contracts (e.g., Rosen (1990), Himmelberg and Hubbard (2000), Hubbard (2005), Gabaix and Landier (2008)). On the other hand, a number of scholars argue that the delegation mechanism has a crucial effect on CEO compensation, and that board decisions with respect to compensation can deviate considerably from labor market values (e.g., Fama (1980), Fama and Jensen (1983), Jensen (1993), Hall and Murphy (2003), Bebchuk and Fried (2003, 2004)).

How important is the board of directors in setting CEO compensation? How do procedural requirements adopted by boards affect CEO compensation decisions? The purpose of this article is to examine these questions. We study the effect of the new U.S. laws on corporate boards to shed light on this issue. In response to the corporate scandals in the United States in 2001 and 2002, the Sarbanes-Oxley Act and the new rules of the major exchanges established new restrictions on the structure and operations of boards. The purpose

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of these rules was to "... strengthen corporate governance practices of listed companies."¹ The main provisions of these rules require that (1) a majority of board members on a single board be independent, (2) members of compensation, audit, and nominating committees be independent, (3) separate meetings by nonemployee directors be conducted, and (4) specific written procedures, so-called charters, be used to evaluate CEOs and elect new board members.

In this study we test whether these requirements had an effect on compensation decisions. We use the difference-in-difference approach to compare changes in compensation between firms that were already complying with these requirements and firms that were not complying with them. To measure level of compliance, we focus on three board structure variables required by the rules: the requirement for a majority of independent directors on a single board, the requirement for an independent nominating committee, and the requirement for an independent compensation committee.

We find that firms that did not comply with these requirements significantly decreased CEO compensation in the period after the rules went into effect, compared to the complying firms. The decrease is on the order of 17%, after taking into account performance, size, time-varying shocks to different industries during that period, firm fixed effects, and other variables affecting compensation that changed during that time.

We also find that the one requirement that is strongly associated with a drop in compensation is the requirement that the majority of board members be independent, and that the significant relative drop in compensation comes from the decrease in the bonus and the stock-based compensation.

To further explore the importance of the board in affecting compensation, we study the extent to which the decrease in compensation is related to the existence of other monitoring mechanisms in the noncomplying firms. In particular, we focus on two mechanisms that have been shown to affect compensation. The first is the concentration of institutional holdings (Hartzell and Starks (2003)), and the second is the existence of a nonemployee blockholder on the board (Core, Holthausen, and Larcker (1999)). We find that noncomplying firms that already have a blockholder as well as noncomplying firms that have large concentrations of institutional investors were less affected by the rules. In fact, the reduction in compensation comes mostly from noncomplying firms that did not have these mechanisms in place.

Our finding that director independence is associated with a reduction in compensation is interesting, partly because requiring more independent directors on the board might not necessarily lead to any material effect on director actions. To the extent that CEOs tend to handpick their directors, the legal requirements for independence might not lead to truly independent directors.² We believe that the requirement for independent directors had a bite partly because of the additional requirements from boards. For example, the new nomination

¹ Securities and Exchange Commission press release 34-48745, November 2003.

² See, for example, Shivdasani and Yermack (1999) for evidence on the effect of CEOs on director nomination decisions.

procedures have likely reduced reliance on the CEO in the nomination of directors and the newly elected directors are more likely to be truly independent. In addition, to the extent that directors in noncomplying firms had a weak bargaining position vis-à-vis the CEO, the new procedures may have given them a stronger bargaining position.

We pay particular attention to potential confounding effects that could drive our results. First, the corporate scandals that focused attention on the need for new compensation rules also gave rise to many shareholder groups vigorously advocating certain governance structures, and it is possible that firms that did not have boards with a majority of independent members caught the attention of the public and were under greater pressure to reduce CEO compensation. Second, in 2004, the new requirement by FASB (FAS 123R) to expense options could have led to changes in compensation structure, and it is possible that firms with noncompliant boards reacted differently to the option expensing rule.

We find that these confounding effects are not responsible for the relative drop in compensation. Among noncomplying firms, compensation dropped even in firms that were not affected by the expensing requirement, and variation in shareholder pressure is unrelated to the relative drop in compensation.

This study belongs to a group of studies that look at the effect of board structure on executive compensation (e.g., Yermack (1996), Angbazo and Narayanan (1997), Hallock (1997), Core et al. (1999), Cyert, Kang, and Kumar (2002), Vafeas (2003), Bertrand and Mullainathan (2001), Grinstein and Hribar (2004)). By and large, the studies show that, controlling for the economic determinants of executive compensation, board structure does help to explain cross-sectional variation in CEO compensation. However, such evidence is often criticized as being inconclusive since board structure is an endogenous variable, determined by unobservable firm and CEO characteristics that, in turn, determine CEO compensation (e.g., Thorburn (1997), Hermalin and Weisbach (2003)).

Our research, unlike that of the other studies mentioned here, examines the effect of director regulation on executive compensation. Analyzing a regulation event helps mitigate the endogeneity problem, since changes to board structure can often be attributed to the rulings rather than to unobservable firm and CEO characteristics. By using the difference-in-difference approach, we control for any economic shocks that occurred during the legislation event and that could have affected compensation levels in all firms. We also contribute to the existing literature by shedding light on the importance of procedural changes in boards when firms have other monitoring mechanisms in place.

This study also contributes to research that examines the relation between governance regulations and firms' policies. For example, Dahya, McConnell, and Travlos (2002) find that U.K. firms changed their CEO replacement policy in response to the Cadbury committee recommendations, and Leuz, Triantis, and Wang (2008) find an increase in the number of firms that go dark after the Sarbanes-Oxley Act.

The remainder of the paper is organized as follows. In Section I we describe previously existing empirical literature and the stock exchanges recent rules. Section II describes the data and the variables. Section III explains the results of our study, and Section IV describes robustness tests. Section V discusses our results and Section VI concludes.

I. Review of the Literature and Recent Legislation

In most public corporations, compensation decisions are made by a board of directors, which represents the shareholders. Several scholars have emphasized the importance of board structure in determining manager compensation. For example, Fama (1980) and Fama and Jensen (1983) argue that compensation decisions should be delegated to outside directors, that is, directors who do not work for the firm or have an affiliation with officers of the firm. These scholars argue that such directors are better able to make unbiased judgments about the quality of the CEO and in turn efficient compensation, hiring, and firing decisions. Jensen (1993) argues that major problems exist with regard to the quality of monitoring by board members in public U.S. firms. These problems arise because CEOs in public U.S. firms have great influence over the nomination of new directors and directors who are nominated by the CEO feel obligated to the CEO. Further, directors typically have little time to monitor managers effectively, and in many cases have little stake in the corporation. Jensen also argues that CEOs often control a board's agenda, leaving little opportunity for boards to question CEOs. Bebchuk and Fried (2003, 2004) argue that such problems have a significant effect on compensation arrangements and that lack of board oversight can lead to suboptimal compensation practices, such as overcompensation. John and Senbet (2003) and Spatt (2006) also point to the agency conflict of directors. Spatt (2006) argues that giving board members incentive compensation could motivate them toward greater involvement and John and Senbet (2003) recommend that compensation arrangements be voted by the shareholders in order to avoid director biases.³

Several studies have shown that board structure explains cross-sectional variation in compensation. For example, Hallock (1997) looks at Forbes 500 firms in 1992 and finds that when the board has directors with interlocking

³ While these studies point mainly to the costs associated with having nonindependent directors on the board, other studies argue that there are also benefits of having nonindependent directors. For example, Harris and Raviv (2008) argue that independent directors are less informed, Adams and Ferreira (2006) argue that monitoring by independent directors can be excessive, and Raheja (2005) argues that having employee directors can be good because competition among employee directors over the CEO position can lead to efficient CEO replacements. Since our study only considers the effect of board structure and procedures on compensation, we cannot address the optimality of board structure in general. Indeed, empirical evidence supports the notion that optimal board structure differs across firms (e.g., Hermalin and Weisbach (1998), Linck, Netter, and Young (2007), Coles, Naveen, and Naveen (2008), Boone et al. (2007), Wintoki (2007), Chhaochharia and Grinstein (2007)). See Section V for additional discussion.

relations (i.e., the CEO of company A sits on the board of company B and the CEO of company B sits on the board of company A), compensation to both CEOs is higher. Core et al. (1999) look at the level of compensation to CEOs in large U.S. firms in the mid 1980s and find that the level of CEO compensation is higher when the CEO is involved in the nomination of new directors, when the percentage of affiliated directors on the board is higher, when no director holds a substantial stake in the firm, when the CEO is also board chair, and when the number of directors on the board is large. Cyert et al. (2002) look at the determinants of executive compensation in the early 1990s in a large sample of U.S. public firms, and they find that CEOs who also are board chairs receive higher compensation. Grinstein and Hribar (2004) look at the effect of CEOs' board power on the size of the bonuses they receive for acquiring other firms. Grinstein and Hribar find that the size of the bonus is higher when the CEO is involved in the nomination process for new directors and when the CEO is also board chair.

While, by and large, the association between board structure and compensation practices is established in the literature cited, it is harder to establish from that literature that board structure has a causal effect on compensation practices, because compensation practices and board structure are both endogenous variables determined by unobservable firm and CEO characteristics. To illustrate this endogeneity problem, consider, for example, the model proposed by Hermalin and Weisbach (1998) in which perceived managerial talent increases managerial bargaining power over the filling of vacancies on the board of directors. According to this model, firms in which CEOs are more talented will tend to have directors that are closely tied to the CEO. But since talent is a variable that determines compensation, we should observe a positive relation between compensation levels and the number of members of the board that have ties with the CEO. Yet, this association does not imply that board structure affects compensation decisions. To establish such an effect, one has to control for the unobservable-talent variable.

In this study we use a U.S. legislative event to mitigate this identification issue. In structure, our research is reminiscent of Bertrand and Mullainathan (1999), who study the effect of antitakeover legislation on executive compensation. We, however, focus on the effect of board structure on executive compensation. Since our study looks at the effect of an external intervention with respect to board structure on executive compensation, the endogeneity problem is mitigated.

In February 2002, about 2 months after Enron declared bankruptcy, the then chair of the Securities and Exchange Commission (SEC), Mr. Harvey Pitt, requested that the exchanges look for ways to improve their governance listing standards.⁴ In response, the New York Stock Exchange (NYSE) and the National Association of Securities Dealers, through its subsidiary, the Nasdaq Stock Market (Nasdaq), came up with proposed changes that they sent to the

⁴ Securities and Exchange Commission press release 2002–23, February 13, 2002.

SEC in August 2002 (NYSE) and October 2002 (Nasdaq). The SEC approved these proposals with minor changes in November 2003.⁵

The main provisions of the final NYSE rule are as follows:⁶

- (i) All firms must have a majority of independent directors.
- (ii) An independent director as defined by the NYSE rule is a director that has no material relationship with the listed company, directly, or as a partner, shareholder, or officer of an organization that has a relationship with the company (NYSE 303A.1). In addition, the rule points to certain director ties that disqualify board members from being independent. The main ties are current employment or recent former employment in the firm, family affiliation with the executives of the firm, substantial business ties with the firm, and family affiliation with persons that have such ties with the firm. In general, a director retains his or her affiliation status until 3 years after the termination of such affiliation.
- (iii) The compensation committee, nominating committee, and audit committee shall consist of independent directors.⁷
- (iv) The compensation committee and the nomination committee must have a written charter that defines the obligations of these committees. The committees should also have self-evaluation procedures.
- (v) All audit committee members should be financially literate. In addition, at least one member of the audit committee would be required to have accounting or related financial management expertise.
- (vi) Nonmanagement directors of a company must meet at regularly scheduled executive sessions without management in order to empower non-management directors to serve as a more effective check on management.

The NYSE and Nasdaq required firms to adopt these policies during their first annual meeting after January 15, 2004, but no later than October 31, 2004. Firms with classified boards were given until the second annual meeting but not past December 31, 2005, to comply with the requirements.⁸

It is natural to expect the requirement for an independent compensation committee to directly affect compensation. Since the compensation committee is ultimately responsible for setting compensation, a change in its structure might lead to different compensation arrangements. However, the requirements for a majority of independent directors and an independent nominating committee can also influence compensation. First, the entire board is ultimately responsible for nominating the compensation committee and hence

⁵ Securities and Exchange Commission press release 34-48745, November 4, 2003.

⁶ Nasdaq followed with similar rulings. Nasdaq relaxes some of the NYSE provisions to fit smaller firms. The main difference between the rulings is that Nasdaq allows the compensation and nomination decisions to be held by a majority of independent directors if a formal committee is not established. In our sample, all Nasdaq firms have established a compensation committee and a nominating committee.

⁷ The Sarbanes-Oxley Act, which became effective on July 30, 2002, also requires independence of the audit committee.

⁸ A classified board (also known as a staggered board) is a board for which only a portion of the members (usually one-third) are up for reelection in any given year.

has the ultimate power to affect whether the compensation committee is going to be savvy, well informed, and in possession of the appropriate negotiating skills. One can argue that a board that has more independent directors chooses a compensation committee differently. Second, the entire board ratifies compensation committee recommendations, and thus the bargaining process between the compensation committee and management will be influenced by the composition of the entire board and by the process by which directors are nominated.

Beyond the potential direct effects of these requirements on compensation, there could also be indirect effects. Firms that are less compliant with the independence requirement are potentially more affected by other requirements from the board, such as the requirement for a written charter to explain the compensation policy of the firm, the requirement for a performance evaluation of the committees, and the requirement for board sessions without management.

In this study we do not attempt to distinguish between direct effects and indirect effects. A relation between our director independence measures and compensation can be attributed to either of these effects.

II. Data, Variables, and Methodology

A. Data

Our data source for executive compensation is the Execucomp database, which has all compensation information about firms that belong to the S&P 1500 index, or that once belonged to this index. Our data source for board structure and director information comes from the Investor Responsibility Research Center database (IRRC), which was recently bought by the Institutional Shareholder Services (ISS) company. We have IRRC data for the years 2000 to 2005. The database includes information about directors in firms that belong to the S&P 1500 index. In particular, the database has information about whether the director is independent and about whether the director serves on the compensation and nominating committees.⁹

Our analysis spans the years 2000 to 2005. We use the Execucomp database and the director information data for the years 2000 to 2005. To ensure that we do not capture changes in compensation due to firms entering and leaving the samples, and to ensure that the firms are subject to the rules, we include in the analysis only U.S. firms that existed in these two databases for the entire period and that are members of the NYSE or Nasdaq. We retrieve financial information for each of the firms from Compustat. Our final sample comprises 865 firms. All variables are adjusted for inflation using 2002 as the base year.

⁹ As with any study that looks at a subset of firms, the selection criteria could bias the results. However, the use of firm fixed effects (difference-in-differences) mitigates this concern.

*B. Variables**B.1. Director Independence*

The IRRC database has a variable that classifies a director as an independent director. IRRC defines an independent director as a director who is neither affiliated nor currently an employee of the company. An affiliated director is a former employee of the company or of a majority-owned subsidiary; a provider of professional services—such as legal, consulting, or financial—to the company or an executive; a customer of or supplier to the company; a designee, such as a significant shareholder, under a documented agreement between the company and a group; a director who controls more than 50% of the company's voting power (and thus would not be considered to represent the broader interests of minority shareholders); a family member of an employee; or an employee of an organization or institution that receives charitable gifts from the company.

This definition closely follows that of the exchanges. However, it is somewhat more restrictive. According to the IRRC definition, a director who is a former employee of the firm is not independent, even if the employment terminated more than 3 years before the director was seated. A director who has business relations with the firm is also not independent according to this definition, even if the business relationship is insignificant. In contrast, NYSE and Nasdaq allow former employees to become independent directors if more than 3 years have passed since their employment. NYSE and Nasdaq also allow independent directors to have business relations with the firm as long as the transactions are not significant.

We therefore adjust the IRRC definition to be more in line with the exchanges' definition. We make a partial adjustment by reclassifying nonindependent directors as independent if they were former employees of a firm and 3 or more years have passed since the termination of their employment. Unfortunately, we cannot reclassify nonindependent directors as independent if their business relations are small, because we cannot observe the size of these business transactions. Therefore, our adjusted definition is still somewhat stricter than that of the exchanges.

Table I, Panel A, shows the trend in compliance with the independence requirements, according to our modified definition, between 2000 and 2005.

The table shows that the fraction of firms that comply with the requirement of maintaining a majority of independent directors has increased steadily by 16% from 2000 to 2005. The table also shows that the largest annual increase occurs between 2002 and 2003. This is consistent with the notion that many firms began to change their board structure once the recommendations were put forth by the exchanges. We observe a similar pattern in the fraction of firms that have an independent compensation committee and in the fraction of firms that have an independent nominating committee. Compliance with the compensation committee requirement increased by 11% between 2000 and 2005, and compliance with the nominating committee requirement increased by 49% during that period. The largest increases in compliance with the independence requirement of the compensation committee occur in 2002 (5%) and

Table I
Summary Statistics

The table shows financial, compensation, and governance characteristics of U.S. public firms between 2000 and 2005. The sample consists of 865 firms that have executive compensation information as well as board structure information in the IRRC and the Execucomp databases. In Panel A, an independent director is defined as a director who has not been an employee in the firm in the last 3 years, does not have business transactions with the firm, and has no family ties with employees of the firm. In Panels C and D, numbers without parentheses are averages, and numbers within parentheses are medians. In Panel C, total compensation is the variable *tdc1* in Execucomp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes), long-term incentive payouts, and other compensation. The equity-based portion consists of the value of the options (Execucomp variable *BLK_VALUE*) and the value of the restricted stock (Execucomp variable *RSTKGRNT*). Nonequity-based compensation is total compensation (*tdc1*) minus equity-based compensation. In Panel D, market value is the market capitalization of equity. Return on assets is net income before extraordinary items and discontinued operations divided by the book value of assets, and stock return is annual stock return (dividend reinvested). New economy firms are as defined in Murphy (2003), and consist of firms that belong to high-tech industries.

Panel A: Governance Characteristics						
	2000	2001	2002	2003	2004	2005
Portion of boards with majority of independent directors (%)	79	78	83	90	93	94
Portion of boards with independent compensation committee (%)	75	72	77	81	86	86
Portion of boards with independent nominating committee (%)	30	32	44	62	78	79
<i>Other board characteristics</i>						
Average board size	9.89	9.84	9.81	9.73	9.75	9.68
Portion of boards with a nominating committee (%)	47	56	68	88	97	98
Portion of boards with a compensation committee (%)	98	98	98	99	100	100
Portion of boards with a CEO chair (%)	67	68	68	69	66	64
Panel B: Changes in the Structure of Boards That Did Not Have a Majority of Independent Directors in 2002 and Became Compliant between 2003 and 2005						
Only leaving directors (%)						12%
Only new directors arrive (%)						40%
Both directors leaving and new directors arrive (%)						36%
Did not change any board members (%)						13%
Average # independent arriving						1.31
Average # employee leaving						0.38
Average # independent leaving						0.34
Average # linked leaving						0.37
Total number of firms						86

(continued)

Table I—Continued

Panel C: CEO Compensation (\$thousands)						
	2000	2001	2002	2003	2004	2005
Total compensation	7,427 (3,043)	6,456 (3,086)	5,657 (3,161)	5,283 (3,119)	5,779 (3,773)	5,924 (3,794)
Equity-based compensation	5,264 (1,260)	4,436 (1,421)	3,579 (1,461)	2,854 (1,217)	3,149 (1,618)	3,058 (1,622)
Nonequity-based compensation	2,162 (1,324)	2,021 (1,227)	2,078 (1,376)	2,429 (1,506)	2,630 (1,771)	2,866 (1,776)
Salary	704 (656)	725 (675)	737 (700)	760 (715)	765 (722)	769 (726)
Bonus	917 (461)	818 (382)	854 (490)	1,091 (583)	1,262 (739)	1,324 (771)
Options	4,732 (1,099)	3,928 (1,207)	2,929 (1,109)	1,973 (834)	2,086 (873)	1,893 (725)
Panel D: Financial Characteristics						
	2000	2001	2002	2003	2004	2005
Sales (\$millions)	6,471 (1,771)	6,651 (1,746)	6,339 (1,705)	6,792 (1,866)	7,477 (2,055)	8,123 (2,238)
Market cap (\$millions)	11,596 (2,145)	10,097 (2,288)	7,887 (1,784)	9,807 (2,459)	10,631 (2,789)	10,778 (2,872)
Return on assets (%)	6.23 (5.17)	3.99 (3.85)	3.84 (4.11)	4.33 (4.27)	5.45 (4.93)	5.49 (5.15)
Stock return (%)	23.97 (14.58)	12.78 (7.06)	-9.05 (-7.22)	40.04 (30.87)	19.63 (16.81)	11.55 (6.59)
Portion of NYSE firms (%)	74					
Portion of Nasdaq firms (%)	26					
Portion of firms that belong to new economy industries (%)	10					

in 2004 (5%), and the largest increase in compliance with the independence of the nominating committee occurs in 2003 (18%).

The results show that there is an increased trend in compliance between 2002 and 2003 in two of the three requirements. This result shows that, although firms were not formally required to comply with the rules until 2004, the publication itself of the proposed recommendations probably led many firms to start complying in 2003.¹⁰ Thus, the year 2003 is a natural breaking point for examining differences between compensation arrangements before and after the rules.

¹⁰ Anecdotal evidence suggests that indeed firms responded directly to the recommendations even before they were required formally. For example, Claires Stores (NYSE, Ticker: CLE) wrote in its June 2003 proxy statement: "... we have taken several steps to voluntarily implement many of the proposed new rules, policies and listing standards. In particular, we have created a new corporate governance and nominating committee; adopted an amended and restated charter for the audit committee; adopted a Code of Ethics for our Chief Executive Officer, Acting Co-Chief Executive Officers and Senior Financial Officers; added one independent director, and including the

The fact that we do not observe almost complete compliance in the year 2005 is puzzling. One possibility is that Nasdaq firms chose not to have formal committees, and therefore only 86% of the firms have an independent compensation committee in 2005 and only 79% of the firms have an independent nominating committee in 2005. However, our results in Panel A show that almost all firms in our sample have compensation committees and nominating committees in 2005, and, therefore, they should all comply with the committee independence requirements. Another possibility is that some firms simply decided not to comply with the rules.¹¹ However, looking at the proxy statements in 2005 for a sample of these noncomplying firms, we find that a vast majority of the firms declare that they do comply with the exchange requirements. A closer look at these firms suggests to us that some firms in our sample are defined as non-compliant in 2005 because the definition we use for director independence is stricter than that of the exchanges.

This measurement error is likely to bias our results against finding an effect of board change on compensation because some firms that are in our noncompliant sample were actually compliant according to the exchanges.

Table I, Panel B, shows the way the firms that did not comply in 2002 with the requirement for a majority of independent directors later became compliant. The table shows that 40% of the firms became compliant by adding more independent directors to their boards. About 36% became compliant by both adding independent directors and dismissing nonindependent directors. Another 12% became compliant by dismissing nonindependent directors, and 13% did not change the composition of the board at all but became compliant when directors who were former employees or had business transactions became independent because 3 years had passed since their transactions with the firms.

The table also shows that, across all noncomplying firms that became compliant, the average number of independent directors arriving is 1.31, and the average number of independent directors leaving is 0.34. These numbers suggest a net increase of about one independent director. The average number of employee-directors and linked directors leaving the firm is 0.38 and 0.37, respectively. Thus, in the sample of noncomplying firms, one independent director entered the board and 0.75 nonindependent directors left the board.

B.2. Executive Compensation

Our dependent variable of interest is CEO compensation. We use the total compensation variable, which includes base salary, bonuses, options (Black-

two new directors our board is recommending to our shareholders, recommended a slate of directors comprised of a majority of independent directors; and granted our committees the authority to retain independent advisors and consultants whenever they deem such action to be in our best interest.”

¹¹ The exchanges have the authority to delist firms that do not comply with the governance requirements. However, they use this option only in extreme cases. See NYSE Governance Rule 303A, Section 13 (penalties).

Scholes value), restricted stocks, and other compensation. This variable is referred to as *tdc1* in the Execucomp database. We also separately look at equity-based compensation and nonequity-based compensation. Equity-based compensation is defined as the total value of options and restricted stock awarded to the CEO, and nonequity-based compensation is the total compensation to the CEO minus the equity-based compensation.¹² We adjust the compensation variables for inflation, using 2002 as the base year.

Panel C of Table I shows summary statistics of CEO compensation in our sample. Average total compensation decreased from \$7.427 million to \$5.283 million between 2000 and 2003 and then increased to \$5.924 million in 2005. Interestingly, the median compensation increased steadily from \$3.043 million in 2000 to 3.794 million in 2005. This result suggests that the decrease in compensation is due to the decrease in the amounts paid to the highly compensated managers.

The average equity-based portion of compensation decreased from an average of \$5.264 million in 2000 to \$3.058 million in 2005, a drop of \$2.206 million. Much of the drop is attributed to the drop in option compensation, which decreased from an average of \$4.732 million in 2000 to \$1.893 million in 2005, a drop of \$2.839 million. In contrast, nonequity compensation has shown an almost steady increase from \$2.162 million in 2000 to \$2.866, an increase of \$0.704 million, most of which is explained by the increase in bonus compensation.

B.3. Control Variables

We use several control variables in the various tests we perform. To control for firm size we use the natural log of the sales of the corporation (in \$millions). To control for performance we use two measures. The first measure is the natural log of the gross annual stock return (dividends reinvested) of the firm. The second measure is the natural log of the gross return on assets, where return on assets is defined as net income before extraordinary items divided by the book value of assets. Both performance measures are lagged 1 year to avoid measuring the effect of compensation on performance. To control for CEO seniority in the firm, we use the natural log of one plus the tenure of the CEO (in years).¹³ Finally, we control for industry shocks that can affect the supply

¹² Execucomp uses the following inputs into the Black–Scholes calculation: The exercise strike price is that specified by the company in its proxy statement. The market price at the time of the grant is assumed to equal the strike price. The term of the grant is 70% of the stated term (to account for early exercise by executives). The risk-free rate is the approximate average yield of a Treasury bond carrying a 7-year term. The volatility is calculated over the 60 months prior to the grant. The dividend yield is the 3-year average dividend yield. Both the dividend yield and the volatility are winsorized at the 5% and 95% levels, using the distribution of the S&P 1500 firms. Execucomp takes the value of the restricted stock grants, salary, and bonuses directly from the CEO compensation table in the SEC filings. In general, firms provide the value of restricted stock using the number of shares granted times the price of share at the time of the grant.

¹³ Since we run our regression with firm fixed effects, CEO seniority is likely to be captured by the fixed effects. However, if the CEO is replaced, then the firm fixed effect is not going to

and demand for CEOs in different industries in different years by interacting industry dummies with year dummies. Our industry classification follows that of Fama and French (1997). All variables are adjusted for inflation, using 2002 as the base year.

Table I, Panel D, shows summary statistics of the financial variables of firms in our sample. Average sales in 2000 are about \$6.5 billion, increasing to about \$8.1 billion in 2005. Median sales are much lower (on the order of \$1.8 billion). The difference between average and median sales suggests that several very large firms skew the sample. Consistent with the downturn in the economy between the years 2000 and 2002, and the upturn between the years 2003 and 2005, average market value decreased between 2000 and 2002 and then increased between 2003 and 2005. Returns on assets and stock returns show a similar pattern.

C. Methodology

We hypothesize that if the board and committee requirements by the exchanges affect CEO compensation, then boards that did not comply with these requirements should respond more to the rules than boards that did comply with them. Our measure of the level of compliance is whether the firm had a majority of independent directors, an independent compensation committee, and an independent nominating committee in 2002 (before the rules were announced). To test this hypothesis, we run the following specification over the balanced panel of 865 firms in the years 2000 to 2005:

$$\begin{aligned} \text{Log}(\text{Compensation}_{it}) = & a_0 + a_1 * \text{Dummy}(\text{Noncompliant Board '02})_i \\ & * \text{Dummy}('03 - '05)_t + a_2 * \text{Dummy}(\text{Noncompliant Compensation committee '02})_i \\ & * \text{Dummy}('03 - '05)_t + a_3 * \text{Dummy}(\text{Noncompliant Nominating committee '02})_i \\ & * \text{Dummy}('03 - '05)_t + [\text{Control } s_{it}] + \text{Firm.Effects}_i + \varepsilon_{It}. \end{aligned} \quad (1)$$

In the above specification, the variables a_1 , a_2 , and a_3 represent the change in the compensation of the noncomplying firms in the postregulation period (years 2003 to 2005) compared to the compensation of the complying firms. The control variables are as specified in the previous section. To account for the potential change in compensation practices for all firms as a result of the corporate scandals, we also interact each of the above size and performance controls with dummy variables for whether the year belongs to the period before the new rules (years 2000 to 2002) or after the new rules (years 2003 to 2005). We also include firm fixed effects to control for any unobservable fixed firm characteristics that can affect compensation, such as the complexity of the tasks that the CEO faces in the firm. In all the regressions we cluster the errors at the firm-period level.¹⁴

capture the change in seniority. Therefore, the tenure variable mostly captures replacements of CEOs.

¹⁴ As a robustness check, we also ran our specification over the period 1996 to 2005 on a subset of 618 firms and clustered the errors at the firm level. The results we got are similar to those

III. Results

A. *Compensation, Majority of Independent Directors, and Committee Independence*

Table II, column 1, shows the results of regression (1) for the sample of 865 firms between 2000 and 2005 (a total of 5,190 firm-years). In the first three columns we show the results from separate runs of each compliance variable, and in the last column we show the results of runs from all compliance variables taken together.

Column 1 shows that the coefficient on the interaction dummy of firms that did not comply with the requirement for a majority of independent board directors is negative and significant, with a magnitude of -0.192 . The magnitude of the coefficient suggests a 17.5% drop in the compensation of firms not complying with the rules, relative to complying firms.¹⁵

The coefficients on the interaction dummies of firms that did not comply with the requirement for an independent compensation committee and the requirement for an independent nominating committee are also negative (columns 2 and 3). However, these coefficients are of much smaller magnitude and are not statistically different from zero. The results are similar when we include all the compliance variables in the same regression (column 4). The interaction variable for the coefficient on the interaction dummy of firms that did not comply with the requirement for a majority of independent directors is negative and significant, with a magnitude of -0.218 . The interaction dummies for the committee requirements are insignificant.

The results suggest that the requirement for a majority of independent directors, rather than that of compensation committee independence or nominating committee independence, is important to compensation decisions. This finding is interesting because it suggests that board-level attributes are more important than committee-level attributes, consistent with the notion that the board has power over the compensation committee and the nominating committee (in the sense that it nominates the compensation committee members and the nominating committee members and it approves the recommendation of those committees). Therefore, the committee actions and power, vis-à-vis the manager, will be influenced by the power of the board of directors. Other explanations for the results are that we have larger measurement error in the level of independence of the compensation committee or the nominating committee than for the majority independence requirement, and that the close correlation

reported. As another robustness check we used a specification over the period 2000 to 2005 but excluding the year 2003 from the sample because it was a transition year. The results are not affected when excluding 2003 from the sample. Finally, we also tried a specification where we include only the years 2002, 2004, and 2005 in the regression. The results are also not affected under this specification.

¹⁵ When the explanatory variable is continuous, then the coefficient represents the drop in compensation for a 1% drop in the explanatory variable. Since the dummy variable is not continuous, the coefficient represents the drop in the log compensation for a change in the dummy variable from zero to one. A drop of 19.2% in the log compensation translates to a discount of $\exp(-0.192)$ (0.825), or a 17.5% drop.

Table II
Total Compensation and Board Compliance

The table shows the results of panel regressions, where the dependent variable is the natural log of total CEO compensation (variable *tdc1* in Execucomp). The sample consists of a balanced panel of 865 firms that exist in Execucomp between 2000 and 2005. *Sales* is the natural log of company sales (Compustat data item 12). *ROA* is the natural log of one plus net income before extraordinary items and discontinued operations divided by the book value of assets—all measured in $(t-1)$. *Returns* is the natural log of the annual gross stock return (dividend reinvested), measured in year $(t-1)$. *Tenure* is the number of years the CEO served in the firm. *Dummy (board noncompliant 2002)* is a dummy variable that equals one if the firm did not have a majority of independent directors on the board in 2002 and zero otherwise. *Dummy (compensation committee noncompliant 2002)* is a dummy variable that equals one if the firm did not have an independent compensation committee on the board in 2002 and zero otherwise. *Dummy (nominating committee noncompliant 2002)* is a dummy variable that equals one if the firm did not have an independent nominating committee and zero otherwise. A director is defined as an independent director if the director was not an employee of the firm during the previous 3 years, if the director does not have family affiliation of the officers of the firm, and if the director does not have any business transactions with the firm. *Dummy ('00-'02)* is a dummy variable that equals one if the observation is in the period 2000 to 2002 and zero otherwise. *Dummy ('03-'05)* is a dummy variable that equals one if the observation is in the period 2003 to 2005 and zero otherwise. *Industry-year fixed effects* are the Fama-French 48-industry dummies (Fama and French (1997)) interacted with year dummies. All variables are adjusted for inflation using 2002 as the base year. The numbers in parentheses are robust standard errors, clustered at the firm-period level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable: Log(Total Compensation)	(1)	(2)	(3)	(4)
Dummy (board noncompliant '02) * dummy ('03-'05)	-0.192** (0.086)			-0.218** (0.093)
Dummy (compensation committee noncompliant '02) * dummy ('03-'05)		-0.014 (0.064)		0.060 (0.058)
Dummy (nominating committee noncompliant '02) * dummy ('03-'05)			-0.033 (0.033)	-0.006 (0.053)
Sales * dummy ('00-'02)	0.305*** (0.066)	0.290*** (0.068)	0.291*** (0.071)	0.304*** (0.066)
Sales * dummy ('03-'05)	0.268*** (0.072)	0.259*** (0.073)	0.258*** (0.075)	0.266*** (0.071)
ROA * dummy ('00-'02)	0.321 (0.399)	0.346 (0.404)	0.351 (0.405)	0.332 (0.397)
ROA * dummy ('03-'05)	0.260* (0.150)	0.248* (0.148)	0.252* (0.146)	0.257* (0.149)
Returns * dummy ('00-'02)	0.123*** (0.033)	0.124*** (0.034)	0.124*** (0.034)	0.124*** (0.033)
Returns * dummy ('03-'05)	0.269*** (0.048)	0.269*** (0.048)	0.269*** (0.048)	0.270*** (0.048)
Tenure	-0.034 (0.022)	-0.029 (0.024)	-0.030 (0.022)	-0.034 (0.022)
Firm fixed effect	+	+	+	+
Industry-year fixed effect	+	+	+	+
<i>N</i>	5,190	5,180	5,180	5,180
Adjusted $-R^2$	26%	26%	24%	25%

between independence of the board and independence of the committee reduces the statistical power of the test.¹⁶

As expected, size and performance have a significantly positive effect on compensation. Moreover, the sensitivity of compensation to stock return is significantly higher after the scandals occurred (years 2003 to 2005) than before, suggesting that overall compensation schemes in years following the scandals differ from schemes that existed before the scandals occurred. The coefficient on the tenure variable is not statistically significant from zero, suggesting that perhaps the firm fixed effects capture the tenure effect for most firms in the sample.

To get a better sense of whether the large drops in compensation were due to other factors, we read the proxy statements between 2003 and 2005 for some of the noncomplying firms that had the largest drop in compensation. We find evidence that, at least in some of these firms, the drop in compensation was associated with a reevaluation of the equity-based portion of compensation by the board. For example, Adobe Systems announced in 2003 that it stopped issuing option compensation to its executives in 2003 because it was reevaluating their incentive compensation plans. Similarly, Compuware announced in 2004 that it revised its executive incentive compensation program. Thus, at least in some of the firms, the drop in the compensation seems to have been associated with reevaluations of incentive compensation plans by the firms' boards.

Finally, it is interesting to compare the magnitude of the effect of board independence in this study to previous studies. Our results suggest a 17.5% drop in compensation for firms that became compliant. Core et al. find that a 1% decrease in the percentage of linked directors on the board is associated with a 0.75% decrease in compensation. They also find that a 1% increase in inside directors is associated with a 0.57% decrease in compensation.¹⁷ Our results in Table I suggest that among the sample of noncomplying firms, the fraction of linked directors decreased by about 4% and the fraction of inside directors decreased by about 4%. Using the estimates from Core et al., the decrease in linked directors should therefore translate to a decrease of about 3% in compensation, and the decrease in insiders on the board should translate to an increase of about 2.2% in compensation. Thus, the total decrease should be on the order of about 0.8%.

This decrease is much lower than the decrease of 17.5% that we find. We attribute the difference to several effects. First, it is likely that firms in the two

¹⁶ We also checked to see whether the effect is coming from the fact that firms that were identified as noncompliant in 2005 were actually compliant to begin with. We therefore restricted our definition of noncomplying firms to include firms that were not compliant in 2002 and became compliant by 2005. Our results are practically the same for this specification as those reported above.

¹⁷ Core et al. find that a 1% decrease in the percentage of linked directors on the board is associated with a \$7,354 decrease in compensation and that a 1% decrease in the percentage of inside directors on the board is associated with a \$5,639 increase in compensation. The average compensation in their sample is \$985,000, which means that a 1% decrease in the percentage of linked directors and inside directors is associated on average with a 0.75% decrease and a 0.57% increase in compensation, respectively.

samples differ from one another considerably because of the different periods involved. In addition, the sample of Core et al. is based on a survey, which could lead to a downward bias in the results. Third, the sample used by Core et al. is from the 1980s—during the 1980s, firms faced increased pressure from the market for corporate control to maximize value and internal monitoring mechanisms were likely to be less important in aligning incentives (Jensen (1993)). The lack of pressure from the market for corporate control during the 1990s could have created a larger effect of board structure on compensation contracts. Fourth, it is also possible that the larger drop in compensation is because the rules also reduced the influence of the CEO in the nomination of new directors. Core et al. find that a 1% increase in the number of directors appointed by the CEO is associated with a 0.42% increase in compensation. Assuming that the exiting directors in our sample were appointed by the CEO and that the new directors on the board (10% of board size) were not appointed by the CEO, the decrease in compensation should amount to an additional 4.2%. The decrease in compensation can be even higher if directors in noncomplying firms were more influenced by the CEO before the rules and became less influenced after the rules because of the new board procedures.

B. Changes to the Components of Compensation

The results described in the previous section suggest that firms without a majority of independent directors reduced their CEO compensation after the regulation went into effect more than did firms with a majority of independent directors. We now explore which of the compensation components is responsible for the drop.

To test which components of compensation are affected, we repeat the analysis in the previous section (focusing on the effect of compliance with the majority-of-independent-directors requirement in reducing CEO compensation), but this time we include as dependent variables the equity-based portion and the nonequity-based portion of compensation.

Table III reports the results. In the first column, the dependent variable is the natural log of the equity-based component of compensation, and in the second column the dependent variable is the natural log of the nonequity-based component of compensation.

The coefficient on the majority independent variable is negative in both specifications, with similar magnitude, but it is statistically significant from zero only for the nonequity-based portion of compensation. The magnitude of the coefficient suggests that the decrease in both portions of compensation is on the order of 17% to 18%.

Overall, the results suggest that firms that were not compliant reduced both the equity-based portion of compensation and the nonequity-based portion of compensation. The decrease is significant only in the nonequity-based portion.

We can further explore which of the components of the equity-based and nonequity-based compensation decreased. To do so, we look separately at the

Table III
Equity and Nonequity Compensation and Director Independence

The table shows the results of panel regressions, where the dependent variables are the natural log of the equity-based portion of CEO compensation and the natural log of the nonequity-based portion of CEO compensation. The equity-based portion consists of the value of the options (Execucomp variable *BLK_VALUE*) and the value of the restricted stock (Execucomp variable *RSTKGRNT*). Nonequity-based compensation is total compensation (*tdc1*) minus equity-based compensation. The sample consists of a balanced panel of 865 firms that exist in Execucomp between 2000 and 2005. The definition of variables appears in Table II. The numbers in parentheses are robust standard errors, clustered at the firm-period level. ** and *** indicate significance at the 5% and 1% levels, respectively.

	Dependent Variable: Equity-Based Compensation	Dependent Variable: Nonequity-Based Compensation
Dummy (board noncompliant '02) * dummy ('03-'05)	-0.186 (0.170)	-0.199** (0.082)
Sales * dummy ('00-'02)	0.494** (0.181)	0.298*** (0.051)
Sales * dummy ('03-'05)	0.370** (0.182)	0.312*** (0.055)
ROA * dummy ('00-'02)	1.237 (0.953)	0.090 (0.235)
ROA * dummy ('03-'05)	1.541 (0.326)	-0.196 (0.124)
Returns * dummy ('00-'02)	0.090 (0.128)	0.135** (0.055)
Returns * dummy ('03-'05)	0.452*** (0.166)	0.143*** (0.037)
Tenure	-0.641*** (0.079)	0.131*** (0.019)
Firm fixed effect	+	+
Industry-year fixed effect	+	+
<i>N</i>	5,190	5,190
Adjusted- <i>R</i> ²	9%	24%

option-based portion of compensation, the cash bonus, the salary, and the stock-based portion of compensation.

Table IV shows a negative but insignificant decrease in the option compensation for noncomplying firms, relative to other firms and their salaries. However, there are significant decreases in the bonuses and in the stock-based compensation. Overall, the results suggest that the drop in compensation in firms that became compliant is mainly attributable to the drop in bonus compensation and stock-based compensation.

Table I showed that average option compensation decreased substantially in the sample, and that bonuses increased. Given the discussion above, we infer that boards in the noncomplying firms decreased option compensation, as did the boards in complying firms, but, unlike complying firms,

Table IV
Compensation Components and Director Independence

The table shows the results of four panel regressions with different dependent variables. The dependent variables are: the natural log of the option portion of CEO compensation (Execucomp variable *Blk_Value*), the natural log of the salary portion of compensation (Execucomp variable *Salary*), the natural log of the bonus portion of compensation (Execucomp variable *Bonus*), and the natural log of stock-based compensation (Execucomp variable *RSTKGRNT*). The sample consists of a balanced panel of 865 firms that exist in Execucomp between 2000 and 2005. The definition of variables appears in Table II. The numbers in parentheses are robust standard errors, clustered at the firm-period level. All variables are adjusted for inflation using 2002 as the base year. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: Option Compensation	Dependent Variable: Salary	Dependent Variable: Bonus	Dependent Variable: Stock-Based Compensation
Dummy (board noncompliant '02)	-0.031	-0.099	-0.108**	-0.503**
* dummy ('03-'05)	(0.190)	(0.096)	(0.053)	(0.208)
Sales * dummy ('00-'02)	0.346*	0.371***	0.389***	0.079
	(0.198)	(0.115)	(0.074)	(0.199)
Sales * dummy ('03-'05)	0.207	0.370***	0.427***	0.175
	(0.197)	(0.12)	(0.072)	(0.201)
ROA * dummy ('00-'02)	0.503	-0.345	-0.450	1.596*
	(0.942)	(0.29)	(0.278)	(0.936)
ROA * dummy ('03-'05)	1.701***	0.019	-0.308**	-0.558
	(0.304)	(0.126)	(0.15)	(0.587)
Returns * dummy ('00-'02)	-0.026	0.029	0.222***	0.062
	(0.13)	(0.037)	(0.048)	(0.135)
Returns * dummy ('03-'05)	0.480**	0.036	0.099**	0.333*
	(0.177)	(0.037)	(0.049)	(0.186)
Tenure	-0.502***	0.120***	0.046*	-0.601***
	(0.085)	(0.023)	(0.025)	(0.082)
Firm fixed effect	+	+	+	+
Industry-year fixed effect	+	+	+	+
<i>N</i>	5,190	5,190	5,190	5,190
Adjusted- <i>R</i> ²	6%	10%	33%	16%

noncomplying firms did not substitute option compensation for bonuses or stock compensation.

IV. Robustness Checks

A. Interaction between the Drop in Compensation and CEO Turnover

The corporate scandals and the drop in market performance in 2002 led to many CEO dismissals. It is possible that our results are due to CEOs entering and exiting firms rather than a decrease in compensation to the same CEOs. Although we control for the tenure variable in regression (1), it is possible that we do not fully capture the replacement effect with that variable. We therefore

Table V
CEO Compensation and CEO Replacements

The table shows the results of a panel regression, where the dependent variable is the natural log of CEO compensation (Execucomp variable *tdc1*). *Same CEO* is a dummy variable that equals one if the CEO was not replaced during the period 2000 to 2005 and zero otherwise. The definitions of the rest of the variables appear in Table II. The numbers in parentheses are robust standard errors, clustered at the firm-period level. * and *** indicate significance at the 10% and 1% levels, respectively.

Dependent Variable: Log(Total Compensation)	
Dummy (same CEO) * dummy (board noncompliant 2002)	-0.274*
* dummy (postregulation period)	(0.148)
Dummy (not same CEO) * dummy (board noncompliant 2002)	-0.081
* dummy (postregulation period)	(0.072)
Sales * dummy ('00-'02)	0.305***
	(0.066)
Sales * dummy ('03-'05)	0.269***
	(0.073)
ROA * dummy ('00-'02)	0.329
	(0.399)
ROA * dummy ('03-'05)	0.257*
	(0.148)
Returns * dummy ('00-'02)	0.123***
	(0.033)
Returns * dummy ('03-'05)	0.271***
	(0.048)
Tenure	-0.025
	(0.022)
Firm fixed effect	+
Industry-year fixed effect	+
<i>N</i>	5,190
Adjusted- <i>R</i> ²	24%

run regression (1) except that we test for the decrease in compensation separately for noncomplying firms that did not replace their CEOs throughout the period 2000 to 2005 and noncomplying firms that did replace their CEOs during that time. If CEO replacements account for the drop in compensation, then the decrease in compensation should come from the sample of firms that replaced their CEOs. A total of 61 noncomplying firms (43% of all noncomplying firms) replaced their CEOs within the 6-year period. This result implies a replacement rate of 7% of CEOs per year. That number is consistent with other studies that look at CEO turnover during that time (e.g., Kaplan and Minton (2006)).

Table V presents the results. The table shows that the group of firms that did not replace their CEOs saw a statistically significant decrease in log compensation of about 27% (about a 23.5% drop in compensation), whereas firms that did replace their CEOs saw a nonsignificant decrease of 8%. The results suggest that the drop in compensation came from firms that did not replace their CEOs, suggesting that the results are not driven by CEO replacements.

B. Controlling for Other Potential Explanatory Variables

One concern with our difference-in-difference approach is that the event itself might not be exogenous. If the ruling event is related to changes in market- and firm-level variables, and if these changes are related to governance structure, then the effect we capture is not related to the rules but to these firm-level variables (Meyer (1995)). For example, a potential reason for the change in compensation and the ruling events could be related to the fall of the high-tech industry. Although we control for the Fama–French 48 industries over time, this industry categorization might not capture well enough the high-tech sector. We therefore use the categorization of the high-tech sector proposed by Murphy (2003). We find that all of the results follow through, even when we control for such categorization.

The passage of the rules was associated also with large changes in the information structure in the market. Corporate scandals led to rulings that enhance transparency in firms and potentially reduce risk and stock price volatility. The literature suggests that firms facing larger risk with respect to their prospects tend to provide higher compensation to their managers (e.g., Core et al. (1999)). If volatility in the prospects of firms with nonindependent boards was reduced more dramatically than that of other firms, then we should expect a larger drop in compensation in these firms regardless of the passage of the law. To rule out this possibility, we run the regressions described in the previous sections, but this time we also include the standard deviation of the stock return (measured monthly over the 48 months and 12 months ending in the beginning of the fiscal year). The inclusion of stock volatility does not alter our results.

A third possible explanation for the change in compensation could be related to systematic differences in changes to growth opportunities over time between complying and noncomplying firms. It is possible that the passage of the law was associated with the fall in growth opportunities in the market. Since growth opportunities are correlated with higher compensation, we could be seeing this effect. We note that our fixed effect and industry–year effects control for growth opportunities at the firm level and for changes in these opportunities at the industry level. However, as a robustness check, we include the q -ratio in the regression, defined as the market value of equity plus the book value of liabilities, all divided by the book value of assets. The inclusion of the q -ratio does not alter our results.

C. Outside Pressure from Investors

The period following the corporate scandals witnessed increased scrutiny from firm investors. For example, several shareholder groups and rating agencies, such as Institutional Shareholder Services, Standard and Poor's, Moody's, and the Corporate Library, established scoring schemes to evaluate firm governance, and institutional investor groups such as the Council for Institutional

Investors protested existing compensation schemes in firms.¹⁸ It is possible that firms that did not comply with the exchange regulations faced stronger scrutiny from investors because of the firms' low governance score and felt more pressure to reduce the compensation of their CEOs.

To account for this possibility, we perform two tests. First, we test whether corporate governance scores issued by shareholder groups in 2002 better explain the drop in compensation than noncompliance with board independence requirements. If, indeed, noncomplying firms were targeted by shareholder groups because of a general lack of governance, then the drop in compensation should be associated with the measurement of lack of governance rather than with the independence requirement. We use the Corporate Governance Quotient (CGQ), established by Institutional Shareholder Services (ISS), as our measure of perceived lack of governance. CGQ measures the strength of the governance structure of a firm (as defined by ISS). For each firm, ISS evaluates the quality of governance based on a list of prespecified criteria and then ranks the firm based on this evaluation relative to a peer group; CGQ is based on this ranking. ISS provides rankings relative to two groups. The first group comprises all public companies and the second group comprises all companies within the same industry group. We add these two measures to regression (1) to see if they better explain the drop in compensation than does the lack of board independence.

Table VI shows the results. In column 1 we add two dummy variables for whether the CGQ of the firm is in the lowest quartile of all CGQs in the sample and for whether the CGQ of the firm is in the highest quartile. In column 2 we add dummy variables for the industry CGQs. Each of these dummy variables is interacted with the postregulation dummy. If, indeed, firms that were targeted by shareholder rankings reduced the compensation, then we should observe a negative and significant coefficient on the low CGQ coefficient.

We find that the CGQ does not explain any of the decrease in compensation. In contrast, the coefficient on the noncomplying board dummy is significantly negative in each of the specifications.

As another robustness check for whether market pressure is responsible for the drop in compensation, we look at whether firms that were subject to class action lawsuits reduced their compensation in the postruling event. Arguably, firms that are involved in class action lawsuits are under the highest pressure to change their conduct. If, indeed, this pressure applies to reduced compensation, then we should observe it in these firms. We therefore add to regression (1) a dummy variable for whether the firm was subject to a class action lawsuit in 2002. In our sample, 19 firms were subject to such a lawsuit in 2002.

Table VI, column 3, shows the results of this specification. The coefficient on the class action lawsuit variable is positive but not statistically different

¹⁸ See, for example, "Here Comes Politically Correct Pay: Board Members Are Looking at CEO Pay Practices through the Eyes of Angry Shareholders," *Wall Street Journal*, April 12, 2004, and "Boards Are Urged to Better Detail Executive Pay," *Wall Street Journal*, October 13, 2004.

Table VI
CEO Compensation and Pressure by Investors

The table shows the results of panel regressions for whether shareholder pressure caused firms to change their compensation, where the dependent variable is the natural log of CEO compensation (Execucomp variable *tdc1*). CGQ (Corporate governance quotient) is a rating developed by Institutional Shareholder Services to measure the quality of corporate governance in a firm compared to other public firms in the economy. Similarly, industry CGQ measures the quality of corporate governance compared to other public firms in the same industry sector. *Low CGQ* is a dummy variable that equals one if the firm's CGQ score in 2002 is in the 25th percentile of the score distribution in the sample. *High CGQ* is a dummy variable that equals one if the firm's CGQ score in 2002 is in the 75th percentile of the score distribution in the sample. *Class action lawsuit* is a dummy variable that equals one if the firm had a class action lawsuit filed against it in 2002 and zero otherwise. The definitions of the rest of the variables appear in Table II. The numbers in parentheses are robust standard errors, clustered at the firm firm-period level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable: Log(Total Compensation)	(1)	(2)	(3)
Dummy (board noncompliant 2002)	-0.220***	-0.213**	-0.192**
* Dummy ('03-'05)	(0.107)	(0.106)	(0.093)
Low CGQ * dummy ('03-'05)	0.083		
	(0.054)		
High CGQ * dummy ('03-'05)	0.039		
	(0.048)		
Low industry CGQ * ('03-'05)		0.060	
		(0.053)	
High industry CGQ * ('03-'05)		-0.003	
		(0.047)	
Class action lawsuit * ('03-'05)			0.136
			(0.128)
Sales * dummy ('00-'02)	0.309***	0.306***	0.309***
	(0.065)	(0.065)	(0.065)
Sales * dummy ('03-'05)	0.268***	0.266***	0.271***
	(0.072)	(0.072)	(0.071)
ROA * dummy ('00-'02)	0.316	0.322	0.302
	(0.398)	(0.398)	(0.396)
ROA * dummy ('03-'05)	0.265*	0.261*	0.263*
	(0.153)	(0.151)	(0.151)
Returns * dummy ('00-'02)	0.118***	0.121***	0.122***
	(0.034)	(0.034)	(0.033)
Returns * dummy ('03-'05)	0.269***	0.269***	0.268***
	(0.048)	(0.048)	(0.048)
Tenure	-0.032	-0.032	-0.034
	(0.022)	(0.022)	(0.023)
Firm fixed effect	+	+	+
Industry-year fixed effect	+	+	+
<i>N</i>	5,190	5,190	5,190
Adjusted- <i>R</i> ²	24%	26%	25%

from zero. In contrast, the coefficient on the noncomplying board dummy is significantly negative. This result does not support the notion that market pressure is the cause of the reduction in compensation in the noncomplying firms.

D. Director Independence and Shareholder Monitoring

The result that CEO compensation has decreased in firms that were affected by the rules still does not mean that independent boards are stronger monitors, or that such monitoring is necessary. In this section we wish to establish more directly the monitoring role of independent directors by examining the interaction between board independence and other monitoring mechanisms. Prior studies have found that firms with stronger shareholder monitoring tend to give lower compensation to their managers. To the extent that such monitoring substitutes for the need of monitoring by independent directors, the exchange requirements from the noncomplying firms should not have an effect on the compensation arrangements in firms that have other monitoring mechanisms in place.

We focus on two shareholder mechanisms that were found to have a significant effect on compensation arrangements. The first is the existence of a nonemployee blockholder on the board. Core et al. (1999) show that when a blockholder sits on the board of directors, compensation to the manager is lower. This result supports Spatt's (2006) conjecture that stronger incentives to directors are likely to make them more effective. The second mechanism is the concentration of institutional holdings. Hartzell and Starks (2003) find that firms with high concentrations of institutional holdings tend to give more efficient compensation schemes to their managers; in particular, compensation to managers is lower. We therefore hypothesize that noncomplying firms that have a nonemployee blockholder on the board or a large concentration of ownership by institutional investors should not decrease the firm's compensation as much as firms that do not have a large concentration of holdings.

To test this hypothesis, we run two specifications based on regression (1). In the first specification we replace the noncompliance dummy with two interaction dummies. The first is the noncompliance dummy interacted with a dummy that equals one if the firm has a blockholder director and zero otherwise. The second is the noncompliance dummy interacted with a dummy that equals one if the firm does not have a blockholder director and zero otherwise. We define a director blockholder as a nonemployee director who holds 5% or more of the shares in the firm. A total of 34 firms that did not comply with the independence requirements in 2002 had a director blockholder (about 25% of all noncomplying firms). In the second specification we repeat the above specification, except that we interact the noncompliance dummy with dummies for high concentration of institutional ownership and low concentration of institutional ownership. As in Hartzell and Starks (2003), we define concentration of ownership as the ratio of the combined holdings of the five largest holdings by institutions to the holdings of all institutions. We define high (low) ownership concentration as concentration in the upper (lowest) quartile of the distribution in our sample.

Table VII column 1 shows that noncomplying firms that have a blockholder did not reduce their compensation after the announcement of the rules. In contrast, firms that did not have a blockholder reduced the log compensation by as much as 27% (which translates to a drop of 23.5% in compensation). A

Table VII
CEO Compensation and Other Monitoring Mechanisms

The table shows the results of panel regressions, where the dependent variable is the natural log of CEO compensation. The sample consists of a balanced panel of 865 firms that exist in Execucomp between 2000 and 2005. *Block ownership* is a dummy variable that equals one if in the year 2002 a nonemployee director has more than 5% of the outstanding shares and zero otherwise. *No block ownership* is one minus block ownership. Concentration of institutional holdings is the sum of the five largest holdings by institutions divided by total institutional holdings. Institutional holdings are from the Thomson Financials 13F database. *Low concentration of institutional holdings* is a dummy variable that equals one if the concentration level is in the 25th quartile of the sample and zero otherwise. *High concentration of institutional holdings* is a dummy variable that equals one if the concentration level is in the 75th quartile of the sample and zero otherwise. The definitions of the rest of the variables appear in Table II. The numbers in parentheses are robust standard errors, clustered at the firm-period level. ** and *** indicate significance at the 5% and 1% levels, respectively.

Dependent Variable: Log(Total Compensation)	(1)	(2)
Block ownership * dummy (board noncompliant 2002) * Dummy ('03-'05)	0.054 (0.106)	
No block ownership * dummy (board noncompliant 2002) * Dummy ('03-'05)	-0.270*** (0.063)	
High concentration of institutional holdings * dummy (board noncompliant 2002) * dummy ('03-'05)		-0.176 (0.112)
Low concentration of institutional holdings * dummy (board noncompliant 2002) * dummy ('03-'05)		-0.238** (0.107)
Sales * dummy ('00-'02)	0.333*** (0.055)	0.304*** (0.065)
Sales * dummy ('03-'05)	0.298*** (0.056)	0.266*** (0.071)
ROA * dummy ('00-'02)	0.285 (0.256)	0.326 (0.398)
ROA * dummy ('03-'05)	0.249 (0.161)	0.258 (0.15)
Returns * dummy ('00-'02)	0.122*** (0.037)	0.123*** (0.036)
Returns * dummy ('03-'05)	0.265*** (0.051)	0.270*** (0.048)
Tenure	-0.034 (0.022)	-0.033 (0.003)
Firm fixed effect	+	+
Industry-year fixed effect	+	+
<i>N</i>	5,190	5,190
Adjusted- <i>R</i> ²	28%	28%

test for the difference in the coefficients of the two variables rejects the null of no difference between the coefficients at the 1% level.

Table VII column 2 shows that firms with low concentration of ownership reduced log compensation by 0.238. The drop is statistically significant from zero. Firms with high concentration of ownership reduced log compensation

by only 0.176, and the drop is not statistically significant from zero. However, a test of differences between the two coefficients cannot reject the null of no difference.

Overall, our results suggest that the existence of other monitoring mechanisms reduces the importance of board independence for compensation decisions.

E. Expensing of Options

Changes to the exchange regulations were accompanied by another event that could have had an impact on executive compensation during that period, specifically, the ruling regarding expensing of options. After the collapse of Enron, voices among investors and regulators were calling for more precise ways to expense options from corporate earnings. The accounting rules that prevailed before 2004 allowed firms to decide how to expense options, and many firms were using the intrinsic value method, which gave a value of zero for at-the-money options. In December 2004, after several iterations, FASB issued a revised ruling for option expensing, requiring firms to use more accurate methods to account for option value in the financial statements.

Evidently, the expensing rule had a direct effect on corporations. Employees of companies such as Cisco and Intel raised their voices against expensing, for fear it would cause companies to stop offering options. Several companies, such as Apple and Berkshire Hathaway announced that they would start expensing options. Other companies, such as Microsoft, announced that they would stop paying options and move to stock-based compensation. It is therefore plausible that the option expensing rule has led some firms to abandon option-based compensation and to move toward stock-based compensation for fear that option expensing would adversely affect the market's perception about the true cost of these options. To the extent that the expensing rule affected noncomplying firms and complying firms differently, we might be capturing this confounding effect.

Our previous results show that the significant reduction in compensation came from the nonequity-based portion of compensation, and that the differential drop in option compensation after the scandals was negative but insignificant. Together, these results do not support the notion that option expensing caused the differential drop in compensation. To further ensure that we are not capturing the expensing effect, we first analyze the distribution of the use of options across noncomplying and complying firms. We measure the extent of option use as the total grant value of options to CEO in the years 2000 to 2002 divided by the total grant value of CEO compensation during that period. We present the results in Table VIII, Panel A.

The panel shows small differences in the use of options across the two subsamples. On average, about 45% of the CEO compensation of complying firms comprises options, whereas only 39% of the CEO compensation of noncomplying firms comprises options. This result suggests that, if anything, noncomplying

Table VIII
Option Expensing

The table shows the results of panel regressions, where the dependent variable is the natural log of CEO compensation. The sample consists of a balanced panel of 865 firms that exist in Execucomp between 2000 and 2005. In Panel A, the value of option compensation (2000 to 2002) is the sum of the Black–Scholes values of the options to the CEO in the firm (Execucomp variable *Blk_Valu*) during the period 2000 to 2002 divided by the sum of total compensation to the CEO during that period (Execucomp variable *tdc1*). In Panel B, the variable *No Options* is a dummy variable that equals one if the firm did not pay any options to its CEO throughout the period 2000 to 2002. The definitions of the rest of the variables appear in Table II. The numbers in parentheses are robust standard errors, clustered at the firm-period level. ** and *** indicate significance at the 5% and 1% levels, respectively.

Panel A: Use of Options across Firms That Comply and Do Not Comply with the Director-Independence Requirements						
Variable: Value of option compensation (2000–2002) divided by value of total compensation (2000–2002)						
	Mean	Median	10 th Pctl	25 th Pctl	75 th Pctl	90 th Pctl
Firms complying with the independence provision	45%	44%	13%	27%	64%	78%
Firms not complying with the independence provision	39%	39%	0%	12%	61%	80%

Panel B: Changes in Compensation to Firms That Do Not Pay with Options		
Dependent Variable:		
Log (Total Compensation)	(1)	(2)
No options '00–'02 * year>2002	0.345*** (0.104)	0.5147*** (0.153)
No options '00–'02* dummy (board noncompliant 2002) * dummy ('03–'05)		–0.443** (0.193)
Sales * dummy ('00–'02)	0.289*** (0.070)	0.286*** (0.070)
Sales * dummy ('03–'05)	0.258*** (0.075)	0.260*** (0.075)
ROA * dummy ('00–'02)	0.421 (0.400)	0.399 (0.400)
ROA * dummy ('03–'05)	0.230 (0.141)	0.233 (0.142)
Returns * dummy ('00–'02)	0.123*** (0.034)	0.121*** (0.034)
Returns * dummy ('03–'05)	0.268*** (0.048)	0.267*** (0.048)
Tenure	–0.024 (0.021)	–0.026 (0.021)
Firm fixed effect	+	+
Industry–year fixed effect	+	+
<i>N</i>	5,190	5,190
Adjusted- <i>R</i> ²	29%	29%

firms should show a lower drop in compensation because they use options less often than do complying firms.

As another check for whether our results are driven by option expensing, we focus on a subset of firms that do not use option compensation as part of their compensation package in the years 2000 to 2002. This subset of firms is unlikely to reduce compensation as a result of the expensing rule because the rule is unlikely to affect it. A total of 60 firms did not give their managers options at all during the period 2000 to 2002. Among the 60 firms, 23 did not comply with the majority-of-independent-directors requirement in 2002.

We first check whether, indeed, these 60 firms show a different compensation pattern in the period 2003 to 2005 compared to other firms in the sample. To do so, we run regression (1), but we replace the noncompliance dummy with a dummy for whether the firm does not pay option compensation. Regression results are in Table VIII, Panel B, column 1. The results show that firms that do not use options increased their compensation between 2003 and 2005 compared to firms that use options. The increase is on the order of 40%. This result supports the claim that, indeed, the reduction in compensation across all firms was related to their use of option compensation during the period 2000 to 2002. However, it still does not tell us whether the drop in compensation for noncomplying firms is driven by the use of option compensation. To disentangle the option-compensation effect for noncomplying firms, we add to the specification another dummy variable for whether the firms that did not use option compensation also did not have a majority of independent directors. If our results are driven by the use of options, then noncomplying firms that did not pay with options should not show a different compensation pattern compared to complying firms that did not pay with options. We present the results in column 2.

The results in column 2 show that, after controlling for the increase in compensation for firms that did not pay with options, firms that did not have a majority of independent directors significantly reduced the compensation. The reduction in log compensation is on the order of 40%, which translates to about a 30% drop in compensation.

Together, our findings suggest that the drop in compensation associated with noncomplying firms is not driven by the option expensing rule.

V. Discussion

The results establish that board characteristics play a major role in the determination of compensation practices after the exchange rules. An important question is whether such changes to boards are optimal, in the sense that they increase shareholder value. According to Bebchuk and Fried (2003, 2004) and Jensen (1993), these changes to board structure should reduce the power that managers have over boards of directors and should therefore enhance shareholder value.

However, such changes could also have a detrimental effect on shareholder value. If boards become too harsh, not giving CEOs the true value of their talent, then in the long run qualified CEOs might not be willing to work in these

jobs, and the quality of these firms would likely deteriorate. Moreover, such requirements might lead to less competition from middle-level managers with respect to CEO positions, since the positions would be associated with lower compensation. Less competition could therefore adversely affect the quality of the management pool in the future. Also, too great a reduction in the incentive base for compensation could make managers less willing to take risks and result in their incentives becoming misaligned with those of the firm.

In this study, we cannot fully resolve the optimality question, partly because not enough time has passed since the relevant legislation became effective to check its effect on the operation of CEOs and firms. However, we point to several pieces of evidence that suggest that the effect could differ across firms. First, we find that the existence of other monitoring mechanisms reduces the effect of independent directors on compensation. To the extent that the independence requirements are costly, and to the extent that other mechanisms already exist, these requirements might be suboptimal in firms that have other monitoring mechanisms in place. Second, in other studies, Chhaochharia and Grinstein (2007) and Wintoki (2007) look at the announcement effect of director rules on equity value. Chhaochharia and Grinstein (2007) compare the announcement effect of the more affected firms to the announcement effect of the less affected firms and find that the effect is positive in large firms but negative in small firms. Wintoki (2007) constructs a composite index of the costs and benefits of having independent directors. He finds that firms with higher costs and lower benefits have a lower announcement effect than firms with lower costs and higher benefits. Together, these findings suggest that the requirements for boards could be suboptimal, at least with respect to some of the firms.¹⁹

VI. Conclusion

Using the difference-in-difference approach we find that the firms that were least compliant with the new governance regulations passed in 2002 decreased compensation to their CEOs after the announcement of the rules. The decrease was on the order of 17% over and above the decrease in firms that were more compliant before the rules. These results suggest that requirements for board structure and board procedures have a significant effect on the structure and size of CEO compensation. We also show that other monitoring mechanisms such as the existence of a large blockholder on the board reduce the effect of board structure and procedures on compensation decisions.

We do not find support for the argument that the effect above comes from investor pressure or from the option expensing rule. The results suggest that

¹⁹ Since small firms seem to suffer more by the rules than larger firms, we check whether the drop in the compensation is related to firm size. We therefore rerun regression (1) except that we separate noncomplying firms that belong to the SmallCap 600 index (a total of 40 firms) from the rest of the firms. We find that the coefficient on the small cap firms is -0.11 (standard deviation 0.08) while the coefficient on the larger firms is -0.21 (standard deviation 0.12). Thus, it seems that larger firms observed a somewhat larger drop in compensation than small firms. However, a test for differences in the coefficients fails to reject the null that the two coefficients are the same.

it is the change in board structure and procedures that is associated with the drop in compensation.

We see two avenues for future research. First, it would be interesting to explore whether changes in board structure affected other board policies, such as CEO replacement policies or nomination policies of new directors. Second, it would be important to explore whether these changes in boards had an actual impact on corporate performance in the long run.

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